

## Alternative Histories of Social Media in Japan and China

by

Mark McLelland (University of Wollongong)

Haiqing Yu (University of New South Wales)

Gerard Goggin (University of Sydney)

Author version of chapter forthcoming in

*The SAGE Handbook of Social Media* (2017)

edited by Jean Burgess, Alice E. Marwick, and Thomas Poell

### Introduction

In her essay for the inaugural edition of the journal *Social Media and Society*, Nancy Baym critiques the idea that there is something inherently new or special about recent social media platforms such as Facebook. She notes that older forms of media like televisions and telephones have always had social applications and that a range of earlier Internet functions have long enabled “connecting with friends and family, discovering what is going on in the world [and] sharing and expressing what matters” (Baym, 2015, p. 1). For Baym, the rise of the term “social media” is more about the corporatization of the Internet and the manner in which companies such as Facebook have developed platforms that “harness what people were already doing” and turned these practices into “revenue streams” (Baym, 2015, p. 1). She notes many of the drawbacks of the corporate model of social networking, not least its domination by a few venture-capitalist companies whose “take-it-or-leave-it” terms of service divest users from their content and promote cultures of mass surveillance where individuals lose control over their data. We need a better model for rethinking communication media, she concludes, not one that treats “humans as data profiles to be matched with advertisers” (2015, p. 2).

Baym’s well-founded critique of the development of the term “social media” as well as the commercialism that underpins today’s immensely popular and revenue-producing platforms is based on the American experience. Indeed Baym notes that some of the world’s most successful social media platforms have been developed by “small groups of (usually) (young) (White) (American) men” (2012, p. 1). But we are moving away from a time when discussions about the Internet and the effects of its myriad applications can be discussed or judged from an exclusively North American (or even wider Anglophone) perspective.

As emergent research is illustrating, there are a wide range of social media platforms that have been established and developed across many different countries. Many of these social media ventures have their own specific antecedents in earlier Internet technologies and cultures, including Bulletin Board Systems (BBS), chat rooms, messaging platforms, mobile social software (“mososo”), web cultures, and so on. Quite a number of social media platforms and forms — especially national social media — have had relatively limited careers, especially with the advent of the present global and regional titans of Weibo, Twitter, Facebook, Instagram, WeChat, and others. Other social media platforms still have substantial national, cross-national, and regional user bases, significance, and cultural influence. Leading examples include, the Russian social media network V Kontakte (В Контакте) known as VK, the African MixIt messaging software, or Korean over-the-top chat, messaging, and digital culture apps Kakao Talk and Line (which took over from the pioneering Cyworld).

There are also some very interesting and important historiographic questions about when social media are inaugurated in different places (cf. Lee, 2016, & Brügger, 2013), where we discern the “breaks” or how do we understand “continuity,” or, indeed, how we make sense of the persistence of, say, BBS in some countries (China, Taiwan, Turkey) and greater prominence of blogs in some countries and contexts (Iran, Taiwan) (Goggin & McLelland, 2017a). Also how do we understand the interplay among different media forms, formats, and preferences, in the kind of “remediations” that particular facets of social media represent? Mobile phones have a greater role in the social media histories of some countries (Japan, Korea, Indonesia, India, Burma) than others where PCs might be decisive at particular points; or the prominence of the press might parlay into some social media forms taking on notable social, cultural, and political functions.

Such apparently historiographic issues in the development of social media take on heightened importance when we consider the uses and abuses of taken-for-granted, or even unnoticed, histories. Consider, for instance, the ways that particular kinds of histories help us imagine, invent, domesticate, use or resist, and deploy ideas, values, and frameworks for how we see, relate to, and live with social media. These kinds of social imaginaries have been drawn to our attention by the important work of Internet historians and scholars such as Janet Abbate (1999), Patrice Flichy (2007), Sandra Braman (2011, 2012), Fred Turner (2006), Thomas Streeter (2011), Robin Mansell (2012), and others. However, we are only at the early stage of documenting, theorizing, and debating non-Western and alternative Internet imaginaries, let alone social media imaginaries.

Thus a basic sense of the range, importance, and influence of these alternative histories of social media is vital, if we are to understand — not misconstrue — the contemporary dynamics of social media. Accordingly, in this chapter, which draws on our earlier work aimed at internationalizing Internet studies and reframing the Internet in terms of its global histories (Goggin & McLelland, 2009 & 2017b), we discuss a range of alternative histories of social media outside the usual North American and European paradigms. In particular, we examine two distinct though also related Asian cases: Japan and China.. Japan and China are significant case studies for several reasons. Firstly both were perceived as coming late to the Internet age, having first to overcome complex coding problems for the input, transfer and display of Han (Chinese) characters which the scripts of both languages share. Both societies also largely missed out on the stage of office automation, particularly the use of typewriters, typical of mid-twentieth century business environments in North America and Europe. There was consequently less familiarity with the keyboard as a text input medium requiring the development of “new literacy and communication practices different from the US” (Sugimoto & Levin, 2000, p. 137). However, once these coding issues had been resolved both societies took to computer mediated communication. By the year 2000 approximately 30 percent of the Japanese population were using the Internet, with 93 percent by 2015 (ITU, 2016). China’s usage climbed from 1.78 percent of individuals in the population using the Internet in 2000, through approximately 28 percent in 2009, and 50 percent by 2015 (ITU, 2016). In relative terms, Japanese share of Internet usage has slipped down the global scale as global language users of Spanish, Arabic and Portuguese increasingly come online, while Chinese users represent the second most prevalent population with the largest number of Internet users in any country (Internet World Stats, 2016a, 2016b; ITU, 2016).

Each case has its own complex dynamics, however there are interesting comparisons and contrasts to be drawn. Taken together, we hope that this two-country comparative discussion illustrates the importance and productiveness of generating alternative social

histories to the dominant accounts — which tend to assume, to their peril, that Western social media platforms and corporations have trumped their non-Western counterparts.

## Japan

Japan is significant for any history of social media because, despite the relatively slow development of PC-based Internet culture during the 1990s, the mobile Internet took off exponentially at the turn of the century — driven largely by young people’s desire for enhanced connection via cell phones. Indeed, there is a marked difference between the kinds of reports about Japan’s adoption of the Internet that appear in computing magazines pre- and post-1999. It was in that year that NTT’s (Japan’s largest telephone company and network provider) rolled out its *i-mode* (that is, information or Internet-mode) cell phones that anticipated many of the functions of today’s smartphones by several years. The innovation of the *i-mode* system that saw Internet connectivity skyrocket in Japan tends to be what is now remembered, at least in the Anglophone literature, about Japan’s Internet history. It was the roll out of mobile Internet and the pioneering handsets and applications developed for them that got Japan “back in the race” (Coates, 2000). However, prior to 1999 the discourse about Japan and the Internet in magazines such as *Wired* was very much framed in terms of bureaucratic incompetence, missed opportunities and “catch-up” based on American models (see for example: Abate, 1996; Johnstone 1994).

The problem with these accounts is that they were so fixated on pointing out what Japan was *not* doing (in terms of models already developed in the United States) that they missed what was actually going on — in particular the important cultural and technological steps that had to be taken in Japan in order for computer mediated communication (CMC), particularly online socializing, to become widely intelligible and acceptable among the general population. Although it is arguable that on a bureaucratic level there were indeed many missed opportunities (Contreras 2014), the grass roots appropriation of CMC in Japan was pioneering in a Japanese context — and, importantly, was always already “social.”

One reason why a highly developed technological society such as Japan came relatively late to the Internet (the first publicly accessible service provider did not commence till 1993) was the necessity of developing software and transmission protocols for the input and display of a complex character-based script. Closely aligned with these encoding difficulties was the fact that Japan had not gone through the same kind of office automation characteristic of Western societies. Although in the Western context the movement from manual typewriter to electric typewriter to personal computer was fairly seamless — given that the QWERTY keyboard remained the main human-machine interface on all these devices — the lack of a standardised input and display system presented a challenge to users of non-alphabet based Asian languages (Contreras, 2014).

Although a system that allowed users to input Japanese text phonetically using the QWERTY keyboard and then press a conversion key to show various options in Japanese script on screen had been developed in 1979, computer literacy remained low in Japan for the next decade. This was partly because there were no standard conversion protocols meaning computer companies developed their own mutually incompatible systems, making it difficult to network devices (Contreras, 2014; Seo, 2013, p. 186). There was also some cultural resistance to reproducing *personal* communication via mechanical means, some older people complaining that printed characters were “‘cold’ and lacked individuality” (Gottlieb 2000: 136-7).

Japan's earliest computer networks were established around 1985 and included Keio University academic, Jun Murai's JUNET (Japan UNIX Network), that established links between one private and two public universities, an American-Japanese collaboration known as TWICS that catered mainly to English-language users and Japan's first major local network, Computer Communication of Oita Amateur Research Association (COARA). The last was a public-private enterprise initially aimed at networking local businesses in order to encourage regional revitalization established in Oita province of Japan's south-western island of Kyushu. However by the late 1980s two computer companies, NEC and Fujitsu had established and were successfully marketing *pasokon tsūshin* or "personal computer communication" networks utilizing the telephone line and modems. These were basically bulletin-board systems (BBS) that enabled users to seek out information from various news feeds as well as participate in online discussions and send e-mail to other users – but in the early years at least, only with those on the same system. Yet, once computerized communication became more available it proved popular, with commentators noting that the new "*wāpuro ningen*" (word-processor human) was likely to write more, and to write more often (Gottlieb, 2000, pp. 141, 147-148).

Reports in the Anglophone press at this time that focused on bureaucratic infighting and the tardiness with which telephone infrastructures and payment systems were responding to consumer demand miss what was actually happening on the ground in Japan in the late 1980s and early 1990s. This was still a time when Japan's computer networks largely functioned as "intranets" since the necessary protocols to connect with the global Internet were not yet in place, in part to do with the lack of standard protocols for the input and conversion of Japanese script (Nishigaki 1998; Fouser 2001). Many commentators were simply oblivious as to how fundamental Roman script was, in the form of the American Standard Code for Information Interchange (ASCII) which was literally built into the architecture of the Internet, including programming languages as well as domain names and web addresses (Pargman & Palme 2009).

Japanese scholarship was, however, clear in recognizing the arrival of new and potentially revolutionary forms of communication – often captured by the transliterated term "network" (*nettowāku*) — including Kumon's *The Network Society* (1988), Kawakami's *The Social Psychology of Electronic Networking* (1994), and Yamane's *Declaration of a Network Republic* (1996). These and other important analyses were clear that the "networking" taking place via these computer systems was very much about person-to-person communication and not at all like the one-to-many mode of information dissemination characteristic of traditional mass media (Izumi 1996). The realization that CMC offered the potential for a wide range of people with divergent experiences to come together online in "people-to-people, two-way communication" encouraged even sites originally founded with business applications in mind to broaden their user-base as happened with COARA which became a "network community" for local residents as early as 1987 (Izumi, 1996, p. 5; Rheingold, 1993, pp. 205-206). As Toru Ono, one of the network's founders, pointed out in his 1994 book *The COARA Electric Nation: How Computer Communication Makes the Regional Global*, "knowledge" is not simply about information exchange but emerges from human interaction (1994, p. 62). Similarly TWICS, the main English-language network at this time, was, according to its systems operator, always "oriented more toward people and communication rather than data and information" (cited in Rheingold 1993, p. 215).

These early networks were extremely important in building a community consciousness among various constituencies, notably feminist women, and those facing adversity such as parents of still-born infants and those suffering chronic illness (Tamura 2017). They were also key in developing communication among otherwise dispersed sexual

minorities such as transgender people (the Eon BBS founded in 1990) and gay men (Gay Net Japan, founded in 1988, grew out of contacts made via the TWICS network).

Although these early networks were important in normalizing the idea of CMC in Japan and crucial in bringing about a new kind of online sociality, they were not taken up by the population as a whole. By 1995, for instance, the two largest commercial networks — NEC's PC-Van (founded 1986) and Fujitsu's Nifty-Serve (founded 1987) — had only around a million users each. This was due to a number of factors, not least an inflexible pricing systems set by the fixed-line providers and the non-intuitive means of inputting Japanese text using the Roman alphabet. A 1997 survey found that in Japan 50.8 per cent of respondents indicated they had never used a computer in comparison to 21.8 per cent of Americans (Fouser, 2001, p. 274). It is no surprise, then, that in Japan, the PC did not emerge as the main interface through which the mass of consumers first accessed the Internet. Rather, a range of hand-held and mobile devices has proven more popular. The different orthographies in the East Asian region necessarily impacted upon the take-up of computerisation in general and the Internet in particular, and led to different developmental trajectories and patterns of use that diverge in many important ways from those characteristic of the United States and Europe.

The importance of understanding the particular developmental trajectories of the mobile Internet in Japan is highlighted by the popularity in the mid-90s of paging devices among high-school girls (a mobile communications phase absent in the youth cultures of Europe and the United States). Okada (2005) notes how in the mid-90s schoolgirls in Japan appropriated paging devices originally developed for the (male) business market, using the keypad on telephones to send simple text messages to the LCD displays of friends' pagers. This led to a distinct *poke-kotoba* (pager-lingo) among the subculture and assisted young people in organizing their private lives outside of parental supervision and control. This innovative use of pagers "created new literacy practices among young Japanese people" (Sugimoto & Levin, 2000, p. 138) and impacted upon the functions of early models of cell phones known as *keitai* (literally "carried in the hand") in Japanese, which included SMS services and from 1999, via *i-mode*, Internet-enabled e-mail which allowed subscribers to write longer messages and also include graphics, audio, video and web links (Matsuda 2005: 35). The success of *i-mode* can partly be put down to its use of a modified form of HTML allowing for increased data speed that enhanced the functionality of the handsets and the kinds of services that were on offer. Young people's use of the service was also innovative in the development of a wide range of text-based emoticons that could be added to email to overcome the perception that computer-based communication was somehow impersonal (Sugimoto & Levin, 2000, pp. 144-146).

In Japan, the rapid uptake in mobile Internet was driven by and for the desire for "social media" among the youth market. Mobile Internet providers were further able to appeal to a youth market by circumventing the high cost of accessing the Internet due to fixed-line charges via an innovative payment system where browsing was free but the user paid per packet downloaded to the phone, receiving an itemised bill each month (Okazaki 2006). A range of services such as subscription to news sites, ticket purchases and music downloads also took advantage of this billing method, obviating the need for credit cards. Given the long commute times in Tokyo, this encouraged commuters to surf the Internet via their *keitai* screens — updating their websites, engaging in chat, looking up news and sports, TV and show schedules, downloading music and ring tones and sending recommendations to friends via email. The *keitai* also saw an innovation in input method for the Japanese language, using a limited numerical keypad where each number on the pad is associated with a sequence of phonetic *kana* syllables, such as -- ka, ki, ku, ke, ko — with the desired syllable being selected

according to the number of button presses. Once the phonetic spelling of the desired term is visible on screen, conversion to the required *kanji* (Chinese character) can be achieved by the use of an arrow button, allowing the entire process to be navigated just by using one thumb – giving rise to the moniker *yubi-zoku* or “thumb tribe” to describe young people who soon became proficient in this input style.

Indeed, since 2000, the uptake among young people of mobile connection to the Internet has been evident across East Asia and has resulted in a “juvenation” of the technology (that is, a movement away from a business model of mobile telecommunications toward a model that focuses on young people’s recreational patterns of use — SMS, gaming, ring tones, downloads, and so on). This movement has very much been dominated by young people’s desire for connection with each other, to stay abreast of the latest trend and to communicate about topics important to them. While not “unique” to Japan (since Japanese patterns of usage are similar in some respects to South Korea), it is clear that pre-existing Japanese cultural norms and practices have exerted a strong influence on the development of *keitai* technology and its deployments. In Japan (and to an extent in other East Asian societies), unlike the Internet, mobile telephony was not “conceived by an elite and noncommercial technological priesthood and disseminated to the masses” but emerged out of young Japanese consumers’ love of “gadget fetishism and technofashion” (Matsuda, 2005, p. 9).

The astonishing uptake of the mobile Internet in Japan, from only one-million *i-mode* subscribers in 1999 to over 40 million in 2003 (Okazaki, 2006, p. 127) is also related to a host of other specific factors, not least the problematic blurring of public and private space occasioned by the advent of the mobile phone. In Japan spoken communication via mobiles that takes place “in public” on buses and trains is frowned upon and needs to be handled with particular decorum. As Matsuda (2005: 24) points out “The physical noise is not the problem. Rather, *keitai* conversations disrupt the order of urban space” through confusing the boundaries of private and public. Okabe and Ito (2005) point out how from 1996, when young people became the main demographic to take up the mobile phone, there developed a voluble media discourse about their use in public settings. One way around this impasse is of course the use of SMS and email which can be actioned with limited disturbance to those around, once again emphasizing the very social nature of the technology — enabling private conversations to take place in public.

Although, as we have seen above, Internet uptake in Japan was always already social from the initial roll-out of “personal computer communications” in the late 1980s, it was the widespread adoption of the mobile Internet at the turn of the century that saw the population of Japanese Internet users surge. Japan’s forward-looking *i-mode* system and specially designed handsets anticipated the smart phone by several years and normalized the use of keyboard and screen for the navigation and communication of both commodities and personal information. Japan’s *keitai* did not evolve out of an established culture of PC use but instead owed their success to the innovative ways in which young people were already using prior technologies such as pagers to send messages and keep in contact – pointing to a very different evolution of social media than that familiar to us from the United States or Europe.

## China

The case of China is pertinent to our discussion of alternative histories of social media, not only because it has the largest number of social media users in the world but also because of its self-sustained social media ecosystem enabled by a gigantic “intranet”. This gigantic

intranet, which is protected by the notorious “Great Firewall,” screens out most of the world’s popular social media applications (such as Facebook, Twitter, Instagram, and YouTube), together with many other Western websites that are deemed harmful to China and the Chinese people. We would note that scholarship on Internet censorship in China is abundant, with some focusing on the technologies and features of the censorship and governance regime, some on the dichotomy between control and resistance, some on its international impact and implication. There has been an increased public-private alliance in constructing a “healthy” and “civilised” Internet, that is, a sanitized and pacified online environment in China (e.g. Lagerkvist, 2011). It is beyond the scope of this chapter for an informed discussion on the dynamics and nuances of Chinese Internet control and censorship regime. Suffice to say that such Internet censorship turns out to be a blessing for domestic Internet service providers, whose copycat versions of global SNSs are both improved and localized products that are now able to compete with their Western counterparts. The Chinese social media market is currently dominated by five applications: QQ (granddaddy of Chinese social media), Qzone (father of Chinese social media), WeChat (Chinese replacement of WhatsApp), Weibo (Chinese replacement of Twitter), and Renren (Chinese replacement of Facebook). (The brief descriptions of the major social media platforms in brackets are indicative of their major functions only. They are all cross-platform social media and social commerce applications akin to a hybrid of Twitter, Facebook, WhatsApp, eBay, and YouTube.) There are many other SNS competing for niche markets.

QQ is the earlier social media in China, which started in 1999. All the other social media applications are the products of China’s social media boom since 2005. However, the history of social media in China did not start from 1999, if we consider “social” as being connected virtually through textual and then audio-visual interfaces. Any discussion of early social media history in China has to date back to the pre-1999 “social” media such as email and BBS and look into the role of technology and human agency in social innovation.

1999, together with 1994 and 1996, marks a milestone in the early history of the Internet and social media in China., as discussed in the following analysis. The early history of social media in China can be roughly divided into three eras: predawn (1986-1993), early dawn (1994-1996), and sunrise (1997-1999). The early Chinese social media developed out of a nebulous state when the Party-state, the fledgling IT industry, and enthusiasts (both professional and amateurs) of computer and information technology were still exploring the power and mystery of computer and Internet mediated communication. It arose out of a “lawless” state, as the first campaign to “civilize” Chinese cyberspace did not start until 2000. This was the “Network Civilization Project”, jointly launched in Beijing by eight key ministries and government agencies, including the Ministry of Culture, State Administration of Radio, Film, and Television, Chinese Telecom, Chinese Mobile, and All Chinese Universities Association, with the aim to educate Chinese people on “civil surfing, civil web building, and civil networks” ([http://www.cnnic.net.cn/hlwfzyj/hlwdsj/201206/t20120612\\_27417.htm](http://www.cnnic.net.cn/hlwfzyj/hlwdsj/201206/t20120612_27417.htm)). Since then the Chinese Internet control and censorship regime has got more stringent and sophisticated.

The predawn (1986-1993) and early dawn (1994-1996) eras of the Chinese Internet age had a very high threshold for the ordinary Chinese. Bandwidth, cost, lack of knowledge of the Web, and lack of skills in Chinese script input systems were four major bottlenecks that limited the use of the Internet to a small group of people. Cost and efficient Chinese script input system were the biggest roadblocks for most people.

In the early days, computer mediated communication was realised through telephone dial-ups, at an exuberant cost. Until the late 1990s, telephone line leasing from China

Telecom was between 5000 to 10,000 yuan for initial installation fees only, with a long and complicated application process. Once the line was connected, one had to bear the expensive ongoing cost, as the telephone dial-up connection to other modems and later the Internet was charged on a time-metered system. Long distance charges when dialling up out of the local calling area was charged at 1 yuan or more per minute. This could not be afforded by an average Chinese whose annual income was only around 5500 yuan in mid-1990s. Home phone ownership was low. Mobile phone ownership was even lower. Indeed mobile phone was a luxury item used by high-income earners, successful businessmen and high-ranking government officials until 1999.

It was not only slow and expensive to use the telephone dial-up connection to other modems and the Internet, but also technically difficult to type Chinese characters and create Chinese content in the computer-mediated communication. As in the case of Japan, the necessity of developing software and transmission protocols for the input and display of a complex character-based script prompted researchers and private entrepreneurs to develop Chinese character input systems using the standard QWERTY keyboard, with some using pinyin (the romanization of Chinese characters), some using strokes, or a combination of pinyin and strokes. Even though the Five Strokes Input System was developed in 1983, it was difficult to learn and master without proper training. Computer literacy remained low in China for the next decade. The invention of the Intelligent ABC system in 1993 made it possible for everyone who could use standard Chinese to type Chinese text phonetically, press the space key to display various options in Chinese characters of the same sound, and choose the right character by pressing the number proceeding it. Although it was still slow, it was now possible for amateurs to read and write Chinese scripts on screen. (There are now about a dozen of simplified Chinese character input systems in pinyin, strokes, and their combination respectively. The most popular ones such as the Sogou pinyin, known as “Intelligent Pinyin” systems, allow one without any training to type quickly by using pinyin initials of all characters in a sentence. The earliest “Intelligent Pinyin” system was invented in 2000.) The lack of facilities, high cost of accessing the web, and lack of skills in Chinese script input system meant that computer-mediated communication was limited to a very small number of leading scientists in research institutions in Beijing and Shanghai via dedicated satellite connection. The Chinese government bore the expense. The early use of computer-mediated communication was for research and academic exchange, via emails and file transfers.

Email was the earliest “social media” in the pre-Internet era in China. It remained “the most-used and most important Internet service” in China until the early 2000s (Shi, 2015, p. 127). The first email from China was sent by Wu Weimin from the High Energy Physics Institute of Chinese Academy of Sciences to a computer in Geneva in 1986 as an experiment (CNNIC, 2009a). But the first officially recognised email from China was sent by two scientists from the Beijing based Institute of Computer Application to Karlsruhe University in Germany in 1987, with only one line “Across the Great Wall we can reach every corner in the world” (CNNIC, 2009a). This event is often heralded as China’s first step toward its Internet age. With the establishment of computer exchange networks in major Chinese cities and of intra-campus and inter-campus research networks in China’s leading universities, email connections were established in 1992 among some of China’s leading universities and academic research institutes in Beijing to enable academic exchange with overseas universities and institutions. This was later extended to universities in eight major cities, such as Shanghai, Guangzhou and Xi’an (CNNIC, 2009a).

Even though email is by no means “social media” by today’s standard, due to its lack of interactivity and dialogic transmission system, it offered the first taste of “being social” among Chinese scientists, academics, university students, and telecom-geeks (enthusiasts



obsessed with trying out new telecommunication technologies as a hobby). Emailing gave early users of radio, computer and later Internet networks the buzz of connecting with people from afar through texts. It offered the early users a taste of the Internet as “an attractive medium for social exchanges” (Shi, 2015, p. 131), particularly after China was fully connected to the World Wide Web in 1994.

China was fully connected to the World Wide Web on 20 April 1994 when the National Computing and Networking Facility of China (NCFC) project led by HU Qiheng set up the first direct TCP/IP connection via a 64K international dedicated line to the Internet through Sprint Co. Ltd of the United States, after years of negotiation with the US government and lobbying the international scientific community (CNNIC, 2009b). After that, major networks, including China Education and Research Network (CERNET), China Science and Technology Network (CSTnet), China Golden Bridge Network (CGBnet), and China Public Computer Internet (ChinaNet), were built and began providing services to nationwide research institutions and university campuses, government agencies (including banks and customs), and the general public in 1996. Within a year, Chinese Internet users grew from several thousand to 0.2 million (Shanghai Technology n.d.).

The full connection to the Internet remained an ivory tower celebration until 1996 when the Internet was open to the public and began to be marked by commercial operations via the newly built ChinaNet. Anybody could connect to the Internet and have an email account upon subscribing to China Telecom’s dial-up services via the telephone line. Email took off as the most talked topic and service in China, reported as the most-used application by 90% of Chinese Internet users (CNNIC, 1999). Few people cared about the (high) cost and (slow) speed in dialling up and sending/receiving emails. Chinese did not have any significant cultural reservation about online socialising with strangers through computer-mediated communication. They embraced social media technologies imported from the West with great enthusiasm, and created a Chinese “online carnival” in the 2000s (Herold & Marolt, 2011).

The craze about emailing and the commercial operation of the Internet in China offered Internet Service Providers (ISPs, both private and public) the opportunity to kick off a booming Internet business. The pioneer of private ISPs is Ying Haiwei, established in 1997 in Beijing. It was modelled after AOL to offer a range of paid services and connections for commercial and individual users, including email and BBS. Its paid email service was very soon challenged by a free email service called 163.com, developed by another private ISP Netease at the end of 1997. Free email service eventually became the mainstream business model and pushed paid email service out of the market in the early 2000s (Shi 2015: 129-130).

Another early form of “social media” and precursor to the World Wide Web and others aspects of the Internet is BBS, firstly computer-based using the Unix system and Mosaic web browser and since 1994 TCP/IP based. The computer-based BBSs were amateur in nature, as they were mostly set up as a hobby by young techno-enthusiasts such as the HAM (amateur radio) community and CFido (Chinese Fido Net) participants, who experimented with radio and computer software (such as ShareWare or FreeWare) for fun and networking, without any commercial interest or political agenda (Lin 2009: 4). The TCP/IP (Transmission Control Protocol/Internet Protocol) based BBS is Internet enabled, which allows same single connection to multiple services by multiple telephone lines and modems for messaging and file transfer. For many early users, BBS was the Internet.

The amateur “social media” started in 1991 with the first CFido BBS “Great Wall” established by a Taiwanese living in Beijing. CFido BBSs were the social media for young techno-enthusiasts between 1993 and 1998. As the earliest form of BBS, CFido was not

Internet based. CFido BBSs were established to connect with other computers via telephone lines and analog dial-up modems. They were mostly run as a hobby by radio and computer enthusiasts to offer free point-to-point communication to other enthusiasts. The CFido BBS operators had to bear the cost of telephone line leasing, the ongoing cost, as well as that of the computer (around 15,000 yuan in the mid-1990s). The setup expense alone was beyond an average Chinese's annual income. The long-distance dial-up fee was difficult to bear by most young techno-enthusiasts. Hence the early BBS were often a local phenomenon, such as Beijing's "Great Wall", Shantou's "Hand in Hand", Guangzhou's "New Moon", and Shenzhen's "PonySoft" (Lin, 2009, pp. 4-5). They offered similar-minded techno-enthusiasts a forum to communicate and exchange information about computing technologies and software. These people often met offline for social gatherings, since they usually lived in the same area. BBS operators were often treated as "celebrities" by their peers.

As the earliest form of "social media", CFido could only allow a small number of people (sometime just 2-3 people) online at the same time. The offline meetings were more "social" than online co-presence. But it nurtured many of the leading figures in the Chinese ICT industry and Internet business, such as DING Lei (founder of Netease), MA Huateng (founder of Tencent Inc.), QIU Bojun (founder of Kingsoft), LEI Jun (CEO of Kingsoft and founder of Xiaomi Inc.), and CHEN Danian (co-founder of Shanda Networking). Their early experience with computer networks, their entrepreneurism released by China's open and reform policies from 1979 onward and particularly after 1993, and their indigenous localisation of Western technologies and services—all these set the foundation and direction of Chinese social media development.

China's first TCP/IP based BBS—the Dawn BBS—was opened upon China's full functional connection with the World Wide Web in April 1994, hosted by the National Research Centre for Intelligent Computing Systems (CNNIC, 2009b). It was the first public and Internet-based BBS in China, and offered services such as news update, online forums, and chat rooms. Soon afterwards, various university campus based BBSs and public BBSs were set up. The most "luxurious" BBS was Shuimu Tsinghua set up by students at the prestigious Tsinghua University in 1995, serving mainly users of the CERnet, with more than 100 discussion groups, email services, online chatting services, and games (Zhao, 1996, p. 65). It remained the most popular campus-based but open-to-public BBS until 2005, when Tsinghua University authorities decided to stop public access and subscription to the BBS by enforcing a real-name and student-ID registration system and by taking control of the BBS servers under the instruction of the Ministry of Education. Under the increasingly stringent Internet censorship regime, other CERnet-based BBSs followed a similar path toward their demise in the eyes of the public. These BBSs, however, remain an important entertainment, information, and socialization hub for Chinese universities students.

Other renowned public BBS in the 1990s include: "SRS BBS", established in 1996 by the Stone company with its popularity at peak in 1997 for publishing a renowned post in its "Sports Salon" section by a user to lament the failure and fate of Chinese men's soccer team (Lin, 2009, pp. 71-74); "MOP", starting in 1997 as a BBS for console gamers and later becoming an entertainment-oriented top BBS in China; "Xici", kicking off in 1998 as the first open-platform online forum in China; "Tianya Forum", established in 1999 as a BBS for stock investors but quickly evolving into a popular BBS with a sociocultural focus; and "Strong Nation Forum", a leftist political and social affairs BBS set up by the Party's flagship newspaper *People's Daily* in 1999 in response to the NATO bombing Chinese embassy in Belgrade (Damm, 2015, pp. 187; Peng, 2005, p. 70, 201). It was during this period all major web portals and search engines also set up BBSs as part their services. These BBS pioneers have continued to grow and re-invent themselves in the 2000s in competition with the IM QQ

and many other social media services. Even QQ gradually transformed itself from being an instant messaging tool to one of the largest instant message based BBS and SNS by mid-2000s.

These interactive and user-generated online forums were marked by “impurity” from the very beginning, compared to CFido. As discussed earlier, the earliest BBSs were expensive and technologically tricky to set up, marked with an amateur “sharism” spirit, and underpinned by freedom of information for fun and networking. The BBSs in operation after 1996, however, were set up by either government agencies or private entrepreneurs, all with clear political agendas and commercial interests. Emailing services followed the same pattern, as they moved from ivory towers to the market after 1996. The eventual triumph of the free email business model over paid email services in the late 1990s signalled another aspect of the “impurity” of Chinese social media: “free” does not equate with “freedom” but user profiles and statistics, which can be traded for both commercial and political purposes. Of course, this is not unique to China but a prevailing concern worldwide on big data, surveillance, and privacy (see for example van Dijck, 2014).

QQ occupies a special place in China’s techno-cultural sphere. Not only does it mark the start of “social media for the people”, due to its low threshold in technological know-how, simple Chinese character encoding system, and low cost. It is also the first truly “social” networking service in China. Furthermore, QQ marked a departure from other early forms of “social media” in China with a “youth and entertainment focus” (Koch et al., 2009, p. 280), and remained for a few years, at least until 2005, the first major “entertainment highway” for young people.

QQ is known as the grandfather of Chinese social media. It was originally called OICQ (until 2001) and developed by Shenzhen-based Tencent, one of China’s biggest Internet companies, in 1998. It was modelled on the then popular ICQ, but allowed users to interconnect with pagers and mobile phones, to personalize their QQ chat rooms, to identify friends who were offline, and most of all, to chat in Chinese using a Chinese encoding software that allowed easy and quick input of Chinese characters (Lin, 2009, pp. 95-96). Although QQ was launched in 1999, QQ games and QQ mobile were not launched until 2003. Tencent launched the most popular SNS in China, Qzone, in 2005, and mobile Qzone in 2007. Upon launching to the public in 1999 it quickly became popular among young Chinese Internet users who enjoyed the convenient and cheap communication with friends through instant messaging (and later entertainment including gaming) via QQ, despite a mixed response to the new social media application from the society (Koch et al., 2009). It soon became, and has continued to be, a must-have application in all Internet cafes in China, on home and office computers, and on young people’s mobile phones. For many people, QQ was the first and only portal of the Internet, an extension of their social networks, a practical and emotional tool and space to live out both sociality and intimacy, both harsh and dream worlds, and the only stable identifier in a flux and floating life (Wallis, 2013, pp. 100-116). QQ users particularly used “information have-less” — a term coined by Jack Qiu to refer to “low-end ICT users, service providers and laborers who are manufacturing these electronics” (2009, pp. 3-4) including internal migrants, laid-off workers, retirees, students, unemployed and under-employed youth.

1999 is a landmark in the history of Chinese social media. It is marked not only by the birth of QQ but also ChinaRen. Like QQ, ChinaRen was also a copycat version of a Western SNS. It was modelled on Friendster, but incorporated elements of AOL into its services. It was more than a social networking site, as it provided a comprehensive range of localised content and services that targeted college students, such as social networking, online forums,

music, games, social life, and news. It was a sensation among young Internet users around 2000, even though its popularity quickly declined after it was bought by Sohu.com in September 2000 and later replaced by more specialised SNS such as Douban (2005-), Xiaonei (2005-2009; renamed “Renren” since 2009), Qzone (2005-), Sina Weibo (2009-), and WeChat (2011-). QQ has continued to improve its service and enjoyed its popularity among Chinese-speaking communities, while ChinaRen is rarely talked about nowadays.

QQ was the product of Ma Huateng (Pony Ma) and his team who were early Chinese ICT enthusiasts and amateur hosts of pre-Internet BBSs, while ChinaRen was established by America-trained techno-entrepreneurs Chen Yizhou (Joseph Chen) and his team. Both were launched at a time when revamping the pricing and Chinese language encoding systems were urgently needed to popularize the Internet in China. Both SNSs played an important role in educating the Chinese about e-life, which has now been replaced by Internet+ — marking the beginning of a booming Internet economy in China.

E-life (e-shenghui) was the earliest buzzword used by entrepreneurs in the IT industry to describe Internet-mediated communication, entertainment, and commercial activities. Internet+ is the latest buzzword, first used by IT entrepreneurs and endorsed by Chinese premier Li Keqiang in his 2015 government work report, to describe a new business model that integrates information technology with traditional industries and new startup companies. Social media such as WeChat provide the great potential of digital economy in the Internet+ framework. QQ, ChinaRen, and their precursors of “social media” (email and BBS), were all products of Chinese copycat entrepreneurship with important elements of indigenous innovation when Western products and services were introduced and localised for the Chinese market. They played an essential role in educating Chinese people about e-life. PC was the main interface through which the mass of consumers accessed social media and the Internet. Social exchange and entertainment were the purposes of people using these services, and the aims of service providers in predawn, early dawn, and sunrise eras of the Chinese Internet and social media. This was soon marked by “impurity” when political and commercial interests became the driving force behind the boom of social media applications, particularly on mobile devices since 2005. As China’s Internet censorship regime becomes more sophisticated over time, social networking for fun and entertainment has become a political decision as well as commercial pursuit for service providers and users alike.

The early history of social media in China (pre-2000) demonstrates the role of grassroots entrepreneurship in technological and social innovation. It debunks the normative interpretation of Chinese media and communication, which credits the Chinese state as promoter, controller, and censor of the Internet, and argues for attention to local dynamics, individual agency, and indigenous innovation in domesticating Western technologies and concepts. ICT Intermediaries, particularly those who are articulate at, or keen observers of, innovations in global technological and business fields and yet at the same grounded in their local and national cultural, political, and socioeconomic contexts and market conditions, are key to the development of the Internet and social media in a pragmatic manner. It is this localised pragmatism and entrepreneurship that have driven social media development along distinctive paths in China and Japan.

## **Conclusion**

In this chapter, we have provided brief but textured and pointed histories of social media in two countries which have loomed largely in earlier (Japan) phases and later phases (China) of development. Our aim has been to provide these concrete case studies of the development of

social media to draw attention to the way that cultural, social, media, economic, political, and market histories are crucial to understanding particular social media histories.

What clearly emerges is the way that particular infrastructural politics and policy bound up with information technology, computers, networking, and media vary considerably — yet what is common is that they exert an enduring influence on contemporary developments. Such dynamics thread through the particular Internet technologies, cultures, and meanings that predominate in different countries that prefigure social media. The influence of messaging (the iconic QQ technology) in China provided an early impetus for entertainment in Internet technology that has become central to contemporary social media. Yet QQ also is an obvious predecessor to the rise of messaging-inflected platforms such as Weibo and WeChat.

Mobile phones and mobile phone culture are another important area for understanding social media histories — especially across many non-Western countries where social media has emerged as mobile media have. Japan is often the celebrated case internationally, and in East Asia, for mobile use. Yet we see that, by contrast, in China the PC remained the only interface until 2000 when China Mobile started its WAP business. QQ mobile, which was launched in 2003, played an important role in popularizing WAP phones (such as Nokia7110). However, the PC was still the main interface to access the Internet until 2009. By contrast, mobile telephony was a symbol of wealth and power, a luxury item for high-income earners, until 1999 with the decreasing pricing of the gadgets. The emergence of shanzhai (copycatting) mobile phones since 2003 made it earlier to own a look-like model of the latest foreign brand phone (an economic factor now behind young Chinese craze for gadget fetishism). Today China leads the world as the largest smart phone and mobile Internet markets with its own highly competitive applications and brands.

Another important area often overlooked in Internet and digital histories is the role of language and script — and this very much applies to social media histories. Given the complex input and display issues associated with non-Roman scripts such as Chinese and Japanese, the introduction of computer-mediated communication in East Asia was less straightforward than in North America and Europe (McLelland, 2017b). Computer users in East Asian societies had first to become familiar with Roman script, the QWERTY keyboard and the non-intuitive “conversion” input style required for local language display before CMC could be embraced by a broad majority.

In closing, we would observe that Japan has long featured in the annals of digital technology research and discourse, its place only comparatively recently taken over by China, a country now attracting intense attention as the market with the greatest number of social media users internationally. There are many other countries, especially Asian countries, who have not been so prominent, yet whose social media histories offer instructive and rich insights. As we have seen in both cases, there remains a kind of weird fascination, even “techno-orientalism” (Morley & Robins, 1992; Roh, Huang & Niu, 2015), via a fantasy image of social media that tells us more about how we imagine global social media in general, especially in Western contexts — than it actually helps us understand social media in particular, or non-Western Asian countries, let alone the realities and materialities of contemporary social media internationally.

## References

- Abate, T. (1996). The Midnight hour: Japan ventures onto the Net in the dark of night. *Scientific American*, January 1, p. 37. Retrieved from <https://www.scientificamerican.com/article/the-midnight-hour/>.
- Abbate, J. (1999). *Inventing the Internet*. Cambridge, MA: MIT Press.
- Braman, S. (2012). Internationalization of the Internet by design: The first decade. *Global Media and Communication*, 8(1), 27-45.
- Braman, S. (2011). The framing years: Policy fundamentals in the Internet design process, 1969-1979. *The Information Society*, 27(5), 295-310
- Brügger, N. (2013). Web historiography and Internet studies: Challenges and perspectives. *New Media & Society*, 15, 752-764.
- Campbell-Kelly, M., & Garcia-Swartz, D. D. (2013). The History of the Internet: The missing narratives. *Journal of Information Technology*, 28, 18-33.
- Chinese Internet Network Information Center (CNNIC). (2009a). Internet events 1986-1993 [1986 nia - 1993nian hulianwang dashi ji]. Retrieved from [http://www.cnnic.org.cn/hlwfzyj/hlwsdj/201206/t20120612\\_27414.htm](http://www.cnnic.org.cn/hlwfzyj/hlwsdj/201206/t20120612_27414.htm).
- CNNIC. (2009b). Internet events 1994-1996 [1994 nia – 1996 nian hulianwang dashi ji]. Retrieved from [http://www.cnnic.org.cn/hlwfzyj/hlwsdj/201206/t20120612\\_27415.htm](http://www.cnnic.org.cn/hlwfzyj/hlwsdj/201206/t20120612_27415.htm).
- Coates, K. (2000). Back in the race: Japan and the Internet. In P. Bowles and L. T. Woods (Eds.), *Japan after the economic miracle: In search of new directions* (pp. 71-84). Dordrecht: Kluwer.
- Contreras, J. (2014). Divergent Patterns of Engagement in Internet Standardization: Japan, Korea and China, *Telecommunications Policy* 38: 914-32.
- Damm, J. (2015). Communities online. In A. Esarey and R. Kluwer (Eds.), *The Internet in China: Cultural, political, and social dimensions (1980s-2000s)* (pp. 184-196). Great Barrington: MA, Berkshire Publishing.
- Danet, B., & Herring, S. C. (Eds.). (2007). *The multilingual Internet: Language, culture, and communication online*. New York: Oxford University Press.
- Flichy, P. (2007). *The Internet Imaginaire*. Cambridge, MA: MIT Press.
- Fouser, R. (2001). “Culture”, computer literacy and the media in creating public attitudes to CMC in Japan and Korea. In C. Ess (Ed.), *Culture, Technology, Communication: Towards an Intercultural Global Village* (pp. 261-278). Albany: SUNY Press.
- Goggin, G., & McLelland, M. (2017a). Introduction: Global coordinates of Internet histories. In G. Goggin & M. McLelland (Eds.), *Routledge companion to global Internet histories*. New York: Routledge.
- Goggin, G., & McLelland, M. (Eds.). (2009). *Internationalizing Internet studies: Beyond anglophone paradigms*. New York: Routledge.
- Goggin, G., & McLelland, M. (Eds.). (2017b). *Routledge companion to global Internet histories*. New York: Routledge.
- Gottlieb, N. (2000). *Word Processing Technology in Japan: Kanji and the Keyboard*. Richmond: Curzon.

- Herold, D. K., & Marolt, P. (Eds.). (2011). *Online society in China: Creating, celebrating, and instrumentalising the online carnival*. London and New York: Routledge.
- International Telecommunications Union (ITU). (2016). Percentage of Individuals using the Internet. Retrieved from <http://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx>.
- Internet World Stats. (2016a). Internet world users by language (top 10 languages). Retrieved from <http://www.internetworldstats.com/stats7.htm>.
- Internet World Stats. (2016b). Top 20 countries with the highest number of Internet users. Retrieved from <http://www.internetworldstats.com/top20.htm>.
- Izumi, Aizu. (1996). Emergence of Netizens in Japan and its Cultural Implications for the Net Society. Retrieved from <http://www.ais.org/~jrh/acn/text/acn12-2.articles/acn12-2.a04.txt>.
- Johnstone, B. (1994). Wiring Japan: A bitter cultural clash has reduced Japan to a third-rate power in networking. *Wired*, Jan 2. Retrieved from [http://archive.wired.com/wired/archive/2.02/wiring.japan\\_pr.html](http://archive.wired.com/wired/archive/2.02/wiring.japan_pr.html).
- Jun, L. (2009). *Bubbling 15 years: Chinese Internet 1995–2009* [Feiteng 15 nian: Zhongguo hulianwang 1995–2009]. Beijing: China CITIC Press.
- Kawakami, Yoshiro. 1993 *Denshi Nettowākingu no Shakai Shinri: Konpyūta Komyunikēshon e no Pasupōto* [The Social Psychology of Electronic Networking: A Passport for Computer Communication], Tokyo: Seishin Shobō.
- Koch, P. T., Koch, B. J., Huang, K., & Chen, W. (2009). Beauty is in the eye of the QQ user: Instant messaging in China. In G. Goggin & M. McLelland (Eds.), *Internationalizing Internet studies: Beyond anglophone paradigms* (pp. 265-284). London and New York: Routledge.
- Kumon, Shumpei. 1988 *Nettowāku Shakai* [The Network Society], Tokyo: Chūōkōronsha.
- Lagerkvist, J. (2011). New media entrepreneurs in China: Allies of the party-state or civil society. *Columbia Journal of International Affairs*, 65(1), 169-182.
- Lee, K.-S. (2016). On the historiography of the Korean Internet: Issues raised by the historical dialectic of structure and agency. *The Information Society*, 32(3), 217-222.
- Mansell, R. (2012). *Imagining the Internet: Communication, innovation and governance*. Oxford: Oxford University Press.
- Morley, D., & Robins, K. (1992). Techno-orientalism: Foreigners, phobias, and futures. *New Formations*, 16, 136-157.
- Nishigaki T. (1998). Multilingualism on the Net. Paper presented at UNESCO INFOethics '98. Downloaded from: [http://www.unesco.org/webworld/infoethics\\_2/eng/papers/paper\\_5.htm](http://www.unesco.org/webworld/infoethics_2/eng/papers/paper_5.htm)
- Okabe, D. and M. Ito. (2005). Keitai in public transportation. In M. Ito, D. Okabe, & M. Matsuda (Eds.), *Personal, Portable, Pedestrian: Mobile Phones in Japanese Life* (pp. 205-218). Cambridge: MIT Press.
- Okada, T. (2005). Youth culture and the shaping of Japanese mobile media: Personalization and the *keitai* as multimedia. In M. Ito, D. Okabe, & M. Matsuda (Eds.), *Personal, Portable, Pedestrian: Mobile Phones in Japanese Life* (pp. 19-40). Cambridge: MIT Press.

- Ono, T. (1994). *Denshi no Kuni "COARA" Pasokon Tsūshin ga Tsukuru Gurōbaru na Chihō* [The "COARA" Electric Nation: How Computer Communication Makes the Regional Global], Tokyo: AI Shuppan.
- Okazaki, Shintaro. (2004). What do we know about mobile Internet adopters? A cluster analysis. *Information & Management*, 43(2), 127-141.
- Pargman, D. and J. Palme. (2009). ASCII Imperialism. In M. Lampland and S. L. Star (eds), *Standards and their Stories: How Quantifying, Classifying and Formalizing Practices Shape Everyday Life* (pp. 177-99). Ithaca: Cornell University Press.
- Peng, L. (2005). *The First Ten Years of Chinese Online Media* [Zhongguo wangluo meiti de diyige shinian]. Beijing: Tsinghua University Press.
- Qiu, J. (2009). *Working-class network society: Communication technology and the information have-less in urban China*, Cambridge, MA: MIT Press.
- Rheingold, H. (1993). *The Virtual Community: Homesteading on the Electronic Frontier*, Harper Collins.
- Roh, D. S., Huang, B., & Niu, G. A. (Eds.). (2015). *Techno-orientalism: Imagining Asia in speculative fiction, history, and media*. New Brunswick, NJ: Rutgers University Press.
- Seo, D. B. (2013). *Evolution and Standardization of Mobile Communications Technology*. Hershey, P.A.: Information Science Reference.
- Shanghai Technology. (n.d.). Internet development and its current state in China [Internet zai woguo de fazhan jingcheng ji xianzhuang]. Retrieved from [http://www.stcsm.gov.cn/jsp/course/browser/03/content.jsp?past\\_cid=257&past\\_id=62&past\\_num=2](http://www.stcsm.gov.cn/jsp/course/browser/03/content.jsp?past_cid=257&past_id=62&past_num=2).
- Shi, S. (2015). Email. In A. Esarey & R. Kluver (Eds.), *The Internet in China: Cultural, Political, and Social Dimensions (1980s-2000s)* (pp. 126-133). Great Barrington, MA: Berkshire Publishing.
- Streeter, T. (2011). *The net effect: Romanticism, capitalism, and the Internet*. New York and London: New York University Press.
- Sugimoto, T., & Levin, J. (2000). Multiple literacies and multimedia: A comparison of Japanese and American Uses of the Internet. In G. Hawisher & C. Selfe (Eds.), *Global Literacies and the World-Wide Web* (pp. 133-153). London & New York: Routledge.
- Tamura, T. (2017). Talking about Ourselves on the Japanese Digital Network. In Goggin, G., & McLelland, M. (Eds.). (2017). *Routledge companion to global Internet histories*. New York: Routledge
- Turner, F. (2006). *From counterculture to cyberculture: Stewart Brand, the Whole Earth Network, and the rise of digital utopianism*. Chicago: University of Chicago Press.
- Van Dijck, J. (2014). Datafication, dataism and dataveillance: Big data between scientific paradigm and ideology. *Surveillance & Society*, 12(2), 197-208.
- Wallis, C. (2013). *Technobility in China: Young migrant women and mobile phones*. New York and London: New York University Press.
- Yamane, K. (1996). *Nettowāku Kyōwakoku Sengen: Pasokon Tsūshin no Ima, Korekara* [Declaration of a Network Republic: Personal Computer Communication Now and in the Future], Tokyo: Chikuma Shobō.



Zhao H. (1996). Online 'bulletin board' [wangshang 'bugao lan']. *Chinese Computer Users* [Zhongguo jisuanji yonng hu], 17, 64-66.