
Three Digital Platforms: Hangzhou Public Library Widens Access to Resources

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ABSTRACT

This article investigates the “three digital platforms” of Hangzhou Public Library 杭州图书馆 through a discussion of information inequality, the digital divide, and community informatics. After an introduction to the context of contemporary China, and in particular Hangzhou, the authors consider the resources themselves with special reference to their ability to reduce information inequality. These resources—the “Three Platforms” referenced in the title of this essay—are: the library’s Website (which can be accessed through standard browser applications), a Wireless Application Protocol (WAP) service that is available to mobile users, and a unique digital television service (that is supplied in collaboration with a local cable television company). As part of this discussion, the authors provide data on the number of users and views each service has had in the time since their implementation; offer detailed information on the profile of Website use and the numbers of library patrons taking part in library activities; assess the impact of these services; and debate their implications for community informatics and digital inequality in Hangzhou. Finally, the authors discuss potential future developments.

INTRODUCTION

China is a country of growing economic inequalities. The Gini coefficient, which measures income distribution in a country, has risen from 41.5 in 2007 to 48 in 2009, where 0 equals perfect equality and 100 equals perfect inequality with all wealth concentrated in one hand (CIA, 2012). The last ten years have seen staggering growth in the usage of ICTs, with the China Internet Network Information Center 中国互联网络信息中心 (hereafter CNNIC) reporting that China’s “netizen” population has grown from 22.5 million in 2001 to 420 million in 2010. This means that China has the largest population of Internet users of any country in the

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world (CNNIC, 2001; CNNIC, 2010). This unprecedented growth has not been even, however, and the CNNIC statistics also reveal a series of digital divides based on geographic location and demographics. In June 2010, 54.8 percent of net users were male, as compared to 45.2 percent female; 35.8 percent were ten to nineteen years old, 35.4 percent were twenty to twenty-nine years old, 19.6 percent were thirty to thirty-nine years old, and only 9.2 percent of users were forty years old or older. Students comprise 30.7 percent of users. And although users report relatively balanced levels of income, an urban–rural divide is evidently in place, with 72.6 percent of users living in urban areas compared to 27.4 percent in rural areas.

This article is an investigation of Hangzhou Public Library's attempt to help bridge these divides by widening access to their online services and developing their community network. The project in question, named the "Three Digital Platforms," targets delivery of digital services along three fronts: television, mobile phones, and the Internet, with the intention of providing equitable access to all potential patrons in the metropolitan area. First, we offer a brief overview of the digital divide, digital inequality, and the role of the library in providing solutions. Then we introduce Hangzhou Public Library and the project in question. Subsequently, we examine the usage data for the three services over the past two years with reference to their impact on digital inequality and community informatics in the district. In conclusion, we draw on the arguments contained within the article to evaluate the efforts of the library.

THE DIGITAL DIVIDE AND INFORMATION INEQUALITY

The concept of a "digital divide" encapsulates the idea that inequalities in access, usage, and ownership of ICTs create a division that separates society into two or more groups characterized by different levels of success in those categories. Divides can exist across national boundaries or within them, and split the world into "information rich" and "information poor" groups. While not all researchers and policy makers originally agreed that the digital divide was a pressing social problem—some even argued that it would solve itself eventually, or that it was a necessary component of global development (Block, 2004; Cawkell, 2001; Compaine, 2001; Lentz, 2000; Thierer, 2000)—it is clear that there are unfortunate consequences for those not engaged in the network society. The negative effects of digital inequality, on the individual level as well as on a regional or national scale, range widely—from impeded economic development (Czernich, Falck, Kretschmer, & Woessmann, 2011), hampered educational and therefore economic opportunities (Huang & Russell, 2006), increased poverty (Cecchini & Scott, 2003), as well as lowered levels of health information awareness (Wagner, Bundorf, Singer, & Baker, 2005) and civic engagement (Jennings & Eitner, 2003). The impact is felt along various social lines—including gender (Selwyn, Gorard, & Furlong, 2005;

Sreekumar, 2007; Torenli, 2006; Wilson, Wallin, & Reiser, 2003); age (Selwyn et al., 2005; Chaudhuri, Flamm, & Horrigan, 2005); education and income (Chaudhuri et al., 2005; Guillén & Suárez, 2005; James, 2008; Selwyn et al., 2005); geography (Wilson et al., 2003); language (Campbell, 2001; Gyamfi, 2005; Kim & Kim, 2001); and religion, ethnicity, and culture (Chen, 2011; Sligo & Jameson, 2000; Sreekumar, 2007).

Proposed solutions to digital inequalities have evolved along with the discourse on the digital divide. Initially, an assumption was made that providing technology would, in and of itself, be enough to promote digital inclusivity and remove the barriers to the network society that appeared to exist (James, 2001a; James, 2001b). As it became evident that providing technology (or access to it) not only failed to remove the “divide” but in fact presented new facets of division, proposed solutions began to reflect a new understanding of ICT usage. Van Dijk identified four main areas where individuals on the wrong side of the “divide” suffered: 1) motivation; 2) material; 3) usage; and 4) skills (Van Dijk, 2005). Scholars also identified several secondary factors, including a lack of relevant content and language barriers for non-English speakers. Some scholars argued that education and training was an important factor in actualizing an individual’s ability to utilize ICTs (Campbell, 2001; Kim & Kim, 2001; Newholm, Keeling, McGoldrick, Macaulay, & Doherty, 2008; Warschauer, 2003). Others scrutinized government policy and Internet regulatory environments (Campbell, 2001; De Boer & Walbeek, 1999; Johnson, 2002). Still others argued for the rapid uptake of open-source software to narrow the divides between developed and developing nations and allow the those with unequal access to information a cheaper alternative to proprietary software (Mutula, 2007; Muhammad & Kanwal, 2009).

Public libraries were encouraged to fight at the forefront of the battle against digital inequality by providing access to computers and the Internet, allowing those without the finances to purchase their own access points a place to go online and join in the digital revolution. In areas of low teledensity or high poverty, a public library is often seen as the best public organization to provide computers with Internet connections to members of the public (Kinney, 2010). In countries with low levels of computer ownership and expensive ICT, public libraries are often the only form of access available to many individuals (Becker et al., 2010; Chaudhuri & Flamm, 2006). Peng and Peng 彭冬莲 & 彭备芳 (2005) stress the need for convenient locations, while Ghosh (2005) called for the expansion of the library network to cover as much territory as possible. Barber and Wallace (2008) found that library computer users in the U.S. were less likely to have access at home and were more likely to come from disadvantaged groups, demonstrating the role the library has in providing a public access point.

Becker et al. (2010) found that library Internet users accounted for

45 percent of all library patrons in the U.S. and that two-thirds of those patrons came to the library with technical or ICT information needs they wanted to satisfy. The report examined the reasons for patrons' use of ICT, identifying eight main motivations: 1) social connections; 2) education; 3) employment; 4) health and well-being; 5) government or legal information; 6) community engagement; 7) financial management; and 8) entrepreneurship. This highlights the role the library can play not just in providing access but also in educating, providing technical information, and promoting social connections and community involvement. The vast amounts of information available on the Internet can, however, lead to information overload. Librarians therefore have an important role to play—not only as information providers and managers but also in making sure the best resources are available to their patrons, by managing content, (Aqili & Moghaddam, 2008), filtering information (Choy, 2007; Omekwu, 2009; Wallis, 2005), and offering virtual reference services (Zheng, 2006). There are many reasons why a patron who otherwise infrequently uses ICT might visit the library to seek ICT assistance. Kinney (2010) shows that patrons visit seeking health, financial, or community information, or support. Thus librarians must know where to look and how to assist the individual in satisfying their information needs. When considering collection development, librarians should consider the ethnic, religious, social, and economic makeup of their patron population and select electronic resources accordingly. This will help to increase the relevance of the content available and to encourage the use of ICTs by vulnerable and excluded groups (Choy, 2007). Collection-development librarians should also work with content providers and database developers to ensure that the resources are useable for those whose skill level is lower than average and that they are relevant to the audience (Salinas, 2003).

Librarians can also bridge the digital divide by directly offering patrons training in information literacy (Hull, 2001; Kinney, 2010; Wu, 2002). This helps individuals utilize technology to satisfy their information needs without expert assistance. Many libraries hold courses designed to help give patrons an introduction to e-mailing, online shopping and banking, and the use of specialized computer programs, all of which serve to develop the information literacy of the patron. Search guides can be produced, and patrons can be taught how best to make use of powerful search tools like Baidu and Google and how best to filter the results and analyze the reliability and authenticity of information (Fourie & Bothma, 2006; Ghosh, 2005; Gyamfi, 2005). Peng and Peng (2005) believe that since librarians operate as "search guides," they also have the ability to educate public library patrons on the content available to help satisfy their information needs. Experts can be invited to share their knowledge with members of staff and patrons alike and to give lectures in information literacy and ICT skills (Wu, 2002). Library staff can also help to develop the skills of patrons

outside of formal training programs by assisting with inquiries when they are using the computers and are unsure of how to proceed (Wallis, 2005). By developing an individual's ability to analyze, interpret, and use information correctly, public libraries can give that person the skills to make proper use of the hardware to which they offer access. Social media skills can also be developed (Porter & King, 2008). Information literacy, homework assistance, and job-application assistance have all been shown to be facets of a librarian's ICT support role (Kinney, 2010). Sandvig (2006) argues that public libraries can educate students on the many uses of the Web and promote their information literacy from a young age, all the while teaching them collaboration and socializing skills.

Hendry (2000) proposes that one role of the national library or central organization in each state should be to train the librarians via online long-distance learning. This would remove much of the difficulty in transferring skills over long distances and would be financially advantageous and less protracted. Several studies have also emphasized the need for patrons to be educated about the ethical issues that information technology use can raise (Aqili & Moghaddam, 2008; Omekwu, 2006).

Libraries have also been encouraged to develop collaborations with other institutions, often through government initiatives and policies. Hendry (2000) described the early efforts of the British government to counteract the social exclusion of the information poor. Cullen (2001) described both the similar Clinton plan in the U.S. and the CAP plan in Canada, which linked business, government, schools, and community groups with libraries in order to increase access to the Internet and information literacy skills as much as possible. Nikam, Ganesh, & Tamizhchelvan (2004) detailed the successes of the Indian government in creating networks between public libraries, NGOs, state governments, and the federal government in order to bridge the divide and in particular spread ICTs to rural areas. Ghosh (2005) highlighted the need for links between institutions. Finally, Peng and Peng (2005) stressed the need for libraries at different levels of administration to collaborate with each other within the Chinese context.

Strengthening community informatics work is another integral aspect of the effort to combat information inequality. Community informatics is the study of how communities interact with ICTs in evolving their culture, economy, history, and selves (Gurstein, 2000; Williams & Durrance, 2009). Since libraries provide both community services and access to ICTs, they—along with community telecenters, digital outreach programs, and community networking—have become a focus within the field (Alkalimat & Williams, 2001; Williams & Durrance, 2009). Chowdhury, Poulter, & McMenemy (2006) argued that public libraries should become community-knowledge centers offering local information through one portal, bringing people together, and transposing information that might previously have been displayed elsewhere to the digital realm. By offering digital

information and acting as a community hub or forum, the library can become an information kiosk of the sort described, in the Indian context, by Sreekumar (2007). By listing events, personal government notices, local news, and historical and cultural information, a library can help bind a community together while encouraging the creation of content that is relevant to patrons. For instance, in making ICT relevant to communities outside the usual spheres of usage, libraries need to produce and reproduce local culture in local languages. Zhang 张俊玲 (2007) argued that, in China, the public library should also help to protect the cultural rights of local communities and allow individuals to engage with popular culture. This, in turn, could support the development of a harmonious society. By training vulnerable groups in at-risk areas and supporting their ability to utilize ICT, libraries can help reduce the divisions caused by unequal distribution of wealth and information access.

The role of the library in bridging the digital divide has also been explored through theory presented in community informatics literature. One of the key elements in a community's relationship with ICTs is that of "cyberpower." Cyberpower describes the effect that users' online interactions have on both existing power structures and individuals' sense of agency. Jordan (1999) split the category of cyberpower into three strata: the individual, the social, and the imaginary. Alkalimat and Williams (2001) developed this idea further by noting that at the "individual" level, power is leveraged by "gaining skills and connections for oneself"; at the "social" level by "gaining skills and connections for a group"; and at the "imaginary or, as we have renamed it, ideological" level by "gaining skills and making connections in order to advance the imaginary: a vision, a movement, an ideological purpose" (p. 140).

This definition of cyberpower plays into the model of community informatics as outlined in Williams, Han, Yan, and Alkalimat (2012). Their model consists of four interactive facets, three types of community interaction, and the conduits that facilitate them. The three communities are: 1) the historical community, which represents social capital; 2) the virtual community, situated in cyberspace; and 3) the networked community, which can develop cyberpower. The historical community feeds its social capital into the virtual community of cyberspace and into the conduits—here termed "cyberorganizers," which represent public computing and the institutions surrounding it—and they, in turn, feed each other and the networked community. As the end product of this community informatics process, the networked community's cyberpower represents the actualization of social power + virtual community.

The digital divide and information inequality are social problems that the library clearly can address. As a network of public facilities in place in both developed and developing countries, libraries constitute an existing framework for the provision of access to ICTs. Implementing ICTs within existing structures theoretically makes it possible to provide access to a

very broad spectrum of individuals and households. Within these environments, knowledgeable staff members can help improve the information literacy of the digitally excluded. They can also act as content filterers and content providers by developing and guiding users to local sources of information. Through collection development they can support information literacy and equal access, and by collaborating with other social actors and institutions, they can help implement policies designed to combat digital exclusion while pursuing their own community informatics initiatives.

HANGZHOU PUBLIC LIBRARY AND THE THREE DIGITAL PLATFORMS

Hangzhou is a medium-sized city in Zhejiang 浙江 Province on the coast of the East China Sea. Its history stretches back over two thousand years to the Qin Dynasty 秦朝. During the first millennium, it became linked with Beijing through the construction of the Grand Canal 大运河 and was the capital of several smaller dynasties during the periods of upheaval following the Song Dynasty. It was Southern China's cultural and economic center, and was visited by Marco Polo. The Chinese even have a saying, 上有天堂, 下有苏杭 ("Shang you tian tang, xia you su hang"): "Heaven above, Suzhou and Hangzhou below." In recent times, it has become a regional center of trade and commerce, as its GDP ranks it second among provincial capitals—behind only Guangzhou 广州 in Guangdong 广东. It has three development zones: Hangzhou Hi-Tech Industrial Development Zone 杭州国家高新技术产业开发区 (established in 1990); Hangzhou Economic and Technological Development Area 杭州经济技术开发区 (established in 1993); and Zhejiang Hangzhou Export Processing Zone 浙江杭州出口加工区 (established in 2000) (China Industrial Space, 2012). Tourism also plays a major part of the local economy, with the famous West Lake 西湖 being a popular destination for domestic and foreign tourists alike.

The population of Hangzhou was 7.966 million in 2008, of which 5.5236 million lived in urban areas. The birth rate was 9.09 per thousand, while the average life expectancy had reached 79.74 years of age. Age-wise, 12.4 percent of the population were 0–14 years old, 76.7 percent were 15–64, and 10.9 percent were 65 and older. High school enrollment was 98.7 percent. Meanwhile, 14.95 percent of the population had completed tertiary education, 15.69 percent had completed high school, and 33.64 percent had completed junior school (Hangzhou Municipal Government, 2012). Mandarin 普通话 is widely spoken in the city, but Wu is the local dialect most commonly in use. It is governed as a subprovincial city, making it the capital of Zhejiang Province and responsible to the Zhejiang authorities, rather than to the central government—in contrast to Beijing 北京, Shanghai 上海, Tianjin 天津, and Chongqing 重庆. It is administered independently from the rest of the province of Zhejiang with regards to its laws and economy.

Various recent incidents involving individual self-sacrifice and altruism have given Hangzhou the reputation within China as a city of great honor, populated by citizens with a well-developed sense of ethics. In 2011, “the most beautiful mother” in China was crowned after a Hangzhou resident caught a young child who fell from a balcony onto the street (“Most Beautiful,” 2011). In 2012, another national hero was anointed: a bus driver saved his twenty-four passengers, dying in the process (Wang & Zhou, 2012). Likewise, the public library garnered national attention in 2011 when Chu Shuqing 褚树青, the library’s curator, posted a new institutional policy online: beggars would now be allowed to use the library’s facilities. This sparked an online debate between those who applauded the altruistic intent of this new policy and those who believed that allowing beggars to enter would negatively impact the library environment (Jia, 2011). Libraries in China have traditionally provided services for free, but during the 1980s they began to charge annual membership fees and each patron was required to have a card to use even the most basic of services. As questions of equitable access began to arise, several pioneering libraries slowly started to offer some of their services for free. In 2003 Hangzhou Public Library began to allow free entrance; it did away with membership fees altogether in 2006. So when the library opened its doors to beggars in 2011, it demonstrated a progression toward the ideal of equal access for all. This act prompted the government to implement a policy across China ensuring that certain core services would be offered for free to all patrons.

In China, library services are administered at the provincial, prefecture, county, and sub-county levels. Each province has one provincial-level library, and each prefecture one prefecture-level library. In some cases, each county will also have a library. According to government statistics, China had 2925 public libraries in operation as of 2011 (not including those from lower administrative levels) (National Bureau of Statistics of China 中华人民共和国国家统计局, 2011). While there is now one library per county in China, the sheer number of people and the nature of the country’s geography means that access for all has still not truly been achieved.

Because each governmental level is responsible for the administration of a library at its level, there has historically been little interaction or interoperability between libraries at different levels, even if they were located within the same province or even city. This model had several drawbacks with regard to service provision: increased costs; restrictions that diminish the convenience and quality of local service; and more-limited funding and support for smaller-level libraries than they would receive if affiliated with a larger library through a main-branch service model. Recently, a certain amount of consolidation in some locations has taken place, including by Hangzhou Public Library, in order to bring services in each area under a more focused administrative framework and to facilitate cooperation. In 2004, the library and its branches, as well as the seven county libraries and their branches, implemented cross-library borrowing and returns using a

single card for all services. Patrons can now return books borrowed in one location to another part of the network, and borrowers' account information is centrally stored at Hangzhou Public library.

In recent years, the focus on technology to aid development has given rise to several government-backed projects designed to increase the availability of ICTs in public libraries. The National Cultural Information Resources Sharing Project 全国文化信息资源共享工程—a project funded by the State Ministry of Finance 财政部 and organized and implemented by the Ministry of Culture 文化部—officially started in April 2002. The project utilizes modern information technology to promote cultural resource building and sharing through the Internet, satellite networks, mobile storage facilities, mirror sites, compact discs, and cable/digital television networks. The goal of the project was to put in place a digital cultural service system while increasing urban and rural coverage. As of May 2009, the central government had invested a total of ¥1.917 billion in funding. So far it has built a national center, 33 provincial-level subcenters, 1687 county-level centers, and 4797 township-level service points, as well as 750,000 village-level service outlets that are shared by this project and other grassroots educational projects (Liáng, Hé, & Chén 梁照月, 何淼; 陈伟, 2009). The Village Access Project 村通工程 brought telephone networks to 130,000 villages between 2004 and 2008, bringing the percentage of administrative villages with coverage to 99.8 percent. Other initiatives—Township to the Internet 乡乡能上网 and Information to the Countryside 信息下乡—brought Internet connections to every township in thirty of China's thirty-one provinces by the end of 2009 and created community e-centers (which provide community services, consulting, training, and culture and entertainment content) in 10,000 locations. In 2009, the Home Appliances to the Countryside 家电下乡 policy was implemented, through which government subsidies were offered to rural residents who purchased any of ten designated household appliances.

Hangzhou Public Library exists at the city level and as such serves the eight million residents of the city. Its directive is to create a “third cultural space” 第三文化空间—that is, after the home and the workplace—and to be a “library for the common people, and a study room for citizens.” The new library building, opened in 2008, is located in the Qianjiang 钱江 new development area of Hangzhou, in the Civic Center. Fellow occupants of this building include the opera house, the convention center, a children's development center, and the city government. The library covers an area of 43,000 square kilometres, has a collection of over four million items, employs 160 staff, and every year receives 3.3 million visits—over 9,000 per day. The main branch is responsible for eight other local branches and automatic book depositories around the city. It actively encourages community involvement in organizing activities for readers, and holds over eight-hundred different sessions per year—ranging from public lectures

to reading promotions to music seminars to Beijing opera 京剧 performances.

The library is keen to harness digital technology to interact with its patrons. Its Sina Weibo 新浪微博 (China's variation on Twitter) account has 16,846 followers and has made 6,473 posts since it was opened. The library also collaborates with patrons to produce and post digital magazines and presentations on its Website. In December 2010, the library launched the ambitious "Three Digital Platforms" project, which aimed to provide access to the library's digital resources to as many of its patrons as possible across three different media: the Internet, television, and mobile phones. The Three Digital Platforms project is unique in China in its scope and features a remarkable level of collaboration—with local government, with patrons, and with local cable television service providers. In 2012, the project was awarded the The Fourth China Ministry of Culture Innovation Award (Office of the Ministry of Culture Innovation Award Committee, 2012).

The following sections will briefly outline the content of the library's ICT services, their delivery, and their development, before presenting their usage statistics.

Website

The Website (www.hzlib.net/) hosts 50.38 TB of data, with access to twenty-six databases, seventeen self-created databases (several of which focus on Hangzhou-related information), thirteen digital magazines, one thousand two hundred movies (including ninety-one in HD-format), six hundred television programs, and forty-five thousand video clips. It implements many of the functions found in library Websites across the globe, offering access to the OPAC; to tools that let patrons search, renew, and reserve items online; and to information about activities, services, and new books available at the library. A Frequently Asked Questions (FAQ) section is supplemented by responses to patrons' questions and a live, online chat window where librarians can interact with patrons having specific problems. Community information and educational links, such as local events and lecture resources, are also displayed. The content of the Website is as diverse as the activities offered by the library and often reflects the themes of these activities. Local Hangzhou recipes are provided, and there are lists of books about West Lake (the city's premier tourist attraction) and archives of library photographs. There is also a cultural information section 文化资讯, which, broken down into Hangzhou, national, and international subsections, includes reports on activities related to the bridges of Hangzhou, artists who have painted Hangzhou, plays and performances that have been held in the city, and collaborations with Hangzhou museums. Further examples of local digitization projects include the Hangzhou-Qian Jiangmei Paradise calligraphy

and painting exhibition and a “Juveniles in the Sun” painting exhibition featuring art by local youths.

Users may take a virtual tour of the building before visiting in person. The Website also contains links to other social networking software so that patrons may “like” the library, and has its Sina Weibo feed streaming on the home page. Patrons are encouraged to review books they have borrowed from the library; these reviews—as well as other promotional material on the homepage—connect directly to the OPAC in an attempt to increase item borrowing.

In order to produce the highest quality product possible, the library reached out to its community and requested assistance from patrons with the requisite technical skills when constructing this Website. Over three hundred borrowers responded and helped to design and launch many of the features listed above. The user community now produces an online magazine, *Salon*—distributed via the Website in Adobe PDF format—which features illustrated poems and recordings of patrons reading texts aloud. The development of *Salon* best encapsulates the processes of community involvement fostered by the library. Initially, the *Salon* project was not well known amongst patrons. It was only after a group of the volunteers decided to post a video on the library Website outlining the history of the magazine and plans for the future that more patrons joined in. As more skilled patrons began to participate, *Salon* developed and evolved into new directions. The library facilitated communication between the different groups using the site, after which some patrons with an interest in editing and publishing decided to form another magazine to publicize the activities taking place within the library. Thus the online magazine *Milan Salon* was born. Another magazine is produced in collaboration with a local publishing company for children in the area. The library also supports patrons’ interest in the Beijing opera, assisting in the production of a user-driven Website designed to display opera-related videos, photographs, and commentary on performances. Links to all of these community resources are available to patrons on the main library Website.

TELEVISION SERVICE

The television services represent what is perhaps the library’s most innovative means of providing digital services to their patrons. In order to develop this service, the library had to collaborate with the city government and, for access to set-top boxes, Hangzhou’s local cable company. It includes an OPAC with the ability to search, renew, and reserve books; a “My Library” space for patrons; book recommendations by librarians and other readers; information on upcoming activities; a digital magazine service; and an audiovisual section that includes recordings of many of the lectures and community activities held at the library. The content of the lectures include internationally, nationally, and locally relevant top-

ics, thus furthering local community development and information provision. In total, there are two thousand digitized magazines and periodicals accessible through the service, as well as six thousand educational and scientific videos. Because cable TV subscription is more prevalent than home computer ownership in Hangzhou (with penetration rates of 93 and 63 percent, respectively), the television portal acts as a much-used alternate Web portal. Operated through the television remote control, this service makes many of the library's online services available to those without other ways to access the Internet. Due to the nature of the medium, the staff has endeavoured to keep the information presented through this service as visual as possible; and, deducing that these viewers would be unused to viewing large amounts of textual information on their television screens, they have also endeavoured to keep information presented therein concise.

MOBILE PHONES

The mobile service (m.hzlib.net/wapopac/web/index.jsp) is offered across a simple WAP platform in three styles for differing connection speeds. This allows for a wide range of mobile phone users to access the platform through browser software, rather than requiring a smart phone application. Initially, the mobile service simply offered news updates concerning the library's facilities, services, and upcoming activities, but it has since expanded to include other facets of service provision. Now, when accessing the site, patrons are presented with a simple log-in screen where they enter their library user ID. A full OPAC service can then be accessed, from which patrons can search, renew, and reserve items. The content of this service is largely restricted to the two thousand periodicals and digital magazines that are available in WAP format and that can be shown either with or without pictures (to account for patrons' various connection capabilities). These periodicals focus mainly on national and international issues, but a smattering of local Hangzhou- and Zhejiang-oriented publications are also available. Due to the ubiquitous nature of the mobile phone in China and the library's desire to offer quick access to as many patrons as possible, the library has devoted considerable attention to the mobile service.

USAGE LEVELS

Data about these services is available with varying granularity over time. Data for the Website was available from 2009—but not on a monthly basis; monthly data about television and mobile services is available—but only from the beginning of 2011 (the launch of the Three Digital Platforms' initiative) until the end of August 2012 (the date of the present study). Television usage figures—representing user "views"—were provided by the cable provider who carries the library's television services. Table

Table 1. Use Statistics for the Library Website in 2009/2010 and for the Three Digital Platforms in 2011 through August 2012

Year/Month	Website	Television	Mobile Phones
2009	344,900		
2010	455,011		
2011			
Jan	97,789	31,465	4,267
Feb	109,405	29,583	3,750
Mar	97,351	25,945	3,580
Apr	109,535	27,520	4,034
May	108,785	23,897	3,528
Jun	100,059	14,577	3,494
Jul	105,317	10,837	4,668
Aug	104,600	17,849	4,576
Sep	101,457	20,537	3,456
Oct	90,858	28,321	3,464
Nov	91,930	16,018	3,597
Dec	80,728	12,337	2,414
2011 Total	1,197,814	258,886	44,828
2012:			
Jan	97,532	14,717	3,477
Feb	93,394	8,083	2,580
Mar	115,601	9,463	3,518
Apr	100,052	10,817	3,535
May	105,488	11,510	3,686
Jun	102,960	14,547	3,589
Jul	118,888	27,934	4,612
Aug	112,110	25,593	4,407
2012 Total	846,025	122,664	29,404

Two's Google Analytics data was only available on a yearly basis from 2010 onwards, and so the two years selected correspond to October 11, 2010, through to October 11, 2011, and October 11, 2011, through to October 11, 2012.

As the data in table 1 demonstrates, the launch of the Three Digital Platforms led to a significant increase in Website usage: the yearly user numbers increased from 344,900 in 2009 to 1,197,814 in 2011 (the year after the platforms' implementation). Numbers stood at 846,025 after the first eight months of 2012, which seems to indicate a slight yearly increase. The Website appears to be the main beneficiary of the project, with usage almost tripling in the year and a half since the launch. Usage of the television service was highest at the start of 2011. It levelled off during the first four months of 2012, but picked up again to very healthy levels during the 2012 school holidays. If current trends continue, the number of users accessing the television services will have decreased by approximately 30 percent (from 258,886 in 2011 to around 180,000 in 2012). The mobile service has been accessed by a relatively consistent number of users; although these numbers range—on the extreme edges—from about 2,400 to 4,700, they generally hold at 3000–4000 per month. If current trends continue, usage levels of the mobile service will have remained roughly consistent in 2011–2012 at 40,000–45,000 users per year.

Table 2. Website Use Provided by Google Analytics

Analytic factor	Visits/Visitors/Views/Duration	
	10/11/2010–10/11/2011	10/11/2011–10/11/2012
Visits	313,378	410,670
Unique visitors	161,321	218,763
New visits	161,701	209,024
Returning visits	151,677	201,646
Visits from Hangzhou	238,308	334,059
Mobile device visits	3,502	13,665
Page views per visit	3.16	2.94
Views	989,667	1,209,088
Average duration of visit	00:03:19	00:03:39

The Website usage information provided in table 2, however, suggests that patrons do not frequently use their mobile devices to access the library site. Only 13,665 visits out of 410,670 originated from mobile phones or tablets between October 2011 and October 2012—up from only 3,502 during the previous year. The detailed Website data in table 1 reveals that page views represent more complex usage patterns. The number of unique visitors has increased over the last two years from 161,321 to 218,763. This increase includes new visitors, returning visitors, page views, and visits from Hangzhou. The percentage of visits from within Hangzhou actually increased over the two years, with the 238,308 representing 76.04 percent of all visits between October 2010 and October 2011 (Beijing is next in line, with 1.77 percent) and the 334,059 representing 81.34 percent of all visits between October 2011 and October 2012 (with Shanghai second at 1.57 percent). The average duration of each user's visit increased from 3 minutes, 19 seconds to 3 minutes, 39 seconds. The average number of pages viewed per visit remained steady at around three.

Table 3 displays the number of activities held in the library since it opened in 2008 and the total number of attendees for each year. This has grown steadily over the last two years since experiencing an explosive increase after the first year of opening. Due to the increases seen previously, the conclusion cannot be drawn that the launch of the three platforms program has had a significant impact on attendance at activities, but there was an increase during 2011, and the data here again helps to reinforce the community emphasis of the library. As stated previously, 60 percent of these activities are organized by community groups with support from library staff.

Table 3. Number of Activities and Number of Attendees per Year

Year	Activities	Users
2008	137	28,256
2009	690	173,460
2010	805	254,378
2011	843	280,635

DISCUSSION

The Three Digital Platforms program clearly represents a leap forward for Hangzhou's public library services. While it would appear that the usage levels for each platform are decreasing slightly and fluctuating from month to month, the drop-off from their initial implementation was probably predictable due to the marketing that accompanied the launch. The indications are that the Website is the most successful and widely used of the three platforms, followed by the television service and then the mobile service. The mobile service is potentially hampered, as was admitted by the librarians in Hangzhou, by its nature as a WAP platform; many of the library's patrons will from now on use smart phones capable of browsing the Internet to access the Website directly. While analytics data supports this to a certain degree, at the moment, far more people use the WAP service than access the Website through a mobile or tablet device. This suggests that most mobile users are using WAP to interact with the library online. This could potentially change if an app for Android or IOS operating systems became available; it would likely increase the usability of smart phone access and provide a one-stop source for library information with functions suited to the smart phone software environment. The WAP service, however, should be maintained since it provides an access point for those more at risk of being informationally marginalized by the smart phone revolution. It also may well be that the majority of mobile users across the world only have access to WAP-enabled mobile technology. Thus the WAP site will be maintained to allow access for those mobile users without a smart phone. The library also plans to introduce a system involving QR codes located in the library and on individual items, which will offer users with camera-enabled smart phones yet another way to find information.

The television service is perhaps the most innovative of the three services available and aims to bridge the digital divide and allow access to the Website's content by broadcasting through the most popular medium in town. Because the penetration level and diffusion of television outstrips that of personal computers (and possibly WAP-enabled phones) it provides an access point beyond traditional computing methods. Before the advent of digital television, something similar could perhaps have been possible through teletext services or static-image broadcasting on local television, but until now, truly interactive services were unimaginable. And although using the television portal offers a different experience than the Website or WAP service, it is uniquely tooled to take advantage of the medium—and to appeal to patrons who are used to television but not ICTs. The inclusion, within television-accessible collections, of videos of lectures held at the library also provides citizens of Hangzhou who live furthest from the library (or who cannot attend for other reasons) the opportunity to take part in ongoing activities.

In keeping with the ideals of community informatics, the library is clearly attempting to encourage Hangzhou's citizens to participate in the network society and form an open community. The Three Digital Platforms are an integral part of this ethos. They provide access points to those who are already involved with the local community and the library, while simultaneously increasing the ways that new community members can become functioning netizens. As the Google Analytics data demonstrate, a large percentage of Website visitors are from the Hangzhou area, indicating a strong local community uses the site. It appears that the growth of activities depicted in table 3 has potentially resulted from the increase in cyberpower the three platforms offer. As more patrons become aware of the range of activities offered, participation increases. The actuality → virtuality → actuality model (Williams et al., 2012) used to visualize the process inherent in creating cyberpower and community development suggests that the three platforms have helped to develop a new actuality in Hangzhou. This is an example of transformation of local culture through the virtual space—as illustrated in particular through the events surrounding the production of *Milan Salon* magazine. The magazine itself enhances cultural life in Hangzhou and increases the cyberpower of the participants involved in the project and in the broader community. The previous reality has been enhanced through the utilization of ICTs, producing a different reality where people are capable of harnessing ICTs for their own and others' benefit.

All three services aim to make an “informatics moment” as Williams described it (2012), easier to manifest, with options for interaction and information-seeking via popular and user-friendly mediums. While much of the content of the Three Digital Platforms is nationally or internationally focused, there is a strong emphasis on local Hangzhou and Zhejiang traditional arts and culture. Collaborations between patrons and library staff have given rise to online magazines for adults and children and to Peking opera performance information. These collaborations highlight the networking elements of the library's services and their transformational role in the community. It is not a simple one-way transmission of information but rather a multisided exchange that strengthens community ties and spreads the use of ICTs. The historical community of Hangzhou is being digitized through the cyber-organizational work of the library and its patrons and through the virtual community in the city. A networked community is being created. Many public libraries create this kind of community; but in this case, there is the added front of television and high levels of active involvement from outside the library. Hangzhou Public Library is taking its role beyond that of simply providing access. It is attempting to make relevant content for its patrons, distribute that content through usable and suitable formats, and develop an integrated community of patrons that excludes none of the city's residents. This thereby enhances the

cyberpower of library users by allowing them to transfer traditional forms of social capital into the online sphere.

THE FUTURE

The Three Digital Platforms initiative appears to be providing a solid platform for reducing information inequality and offering access to the library's services beyond the traditional channels. The WAP service, though considered almost anachronistic by staff members, also enables the online services to be utilized by those patrons without smart phones; those patrons with smart phones, meanwhile, can access the library's Website through browser applications. The high level of community involvement in Website-based content increases the strength of local connection to the library while encouraging participation in library- and community-run activities. The television service is the most effective of the three in reaching the local community in Hangzhou. Though its current user base is not particularly high, it has enormous potential to reduce information inequality since the company providing the service has wide reach within the city. More importantly, although Hangzhou is a developed city with modern information architecture, a significant number of its residents have no home access to the Internet. These individuals now have access to many of the library's services through the television-based portal. The combination of the three platforms—with the possible addition of a still-to-be-developed app for smart phones—offer expanded, convenient access to the library's online services. It also supports community ties. Although the levels of collaboration and funding that this project—and the television platform, especially—requires makes the Three Digital Platform model an impractical option for many other public libraries, its inclusive nature does offer an example of what is possible in a library context.

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