The accidental accomplishment of Little Smart: understanding the emergence of a working-class ICT

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Abstract
This article analyzes one of China’s most prominent working-class ICTs, Little Smart (xiaolingtong), an inexpensive wireless technology which offers limited mobility service at the price of a landline. The case analysis examines how the technology works and diffuses, why it could emerge so rapidly amid structural transformations of China’s telecom reform and the subsequent co-evolution between market dynamics and state policy at the local, national and transnational levels. Drawing from interviews and focus groups, the article discusses usage patterns and the key problems facing Little Smart. Besides the particularities of the case, the emergence of Little Smart has broader implications for understanding the relationship between working-class ICTs and the ‘information have-nots’ in general. It shows that working-class ICTs may materialize through accidental accomplishments with little prior planning by state or corporate players. However, without appropriate policy support, the emergence may not be sustainable in the long run.

Key words
Little Smart • local implementation • mobility • telecom policy • transnational formation • working-class ICTs
INTRODUCTION

Can wireless technology serve low-income communities? If we follow the reasoning of a deepening digital divide (National Telecommunications and Information Administration [NTIA], 1999; van Dijk, 2005), the answer would be pessimistic. The information ‘have-nots’ still lag behind in access to computer and the internet: how can they afford the latest mobile technology? However, this legitimate skepticism is contradicted by recent evidence from the developing world (Castells et al., 2006). In Africa, mobile phones are diffusing among microentrepreneurs (Donner, 2004). In Latin America, wireless local area networks (WLAN) are spreading in the countryside (Galperin, 2005; Galperin and Girard, 2005). In Asia, given the vibrancy of the region’s information technology (IT) industry supported by rapid market expansion and the ‘developmental state’ (Castells, 1998; Samuels, 1994), similar patterns of wireless growth can be observed including, in particular, the emergence of Little Smart (Xiaolingtong) in China.

Little Smart is a low-end wireless technology which allows subscribers to have mobile service at the price of a landline. In December 2006 it was used by 91.1 million Chinese, which would be the world’s fourth largest wireless user population following the number of regular cellphone subscribers in China, Japan and the USA, but more than the entire population of Germany (International Telecommunications Union, 2004).1 Conceptually, Little Smart is but one example of a series of working-class ICTs emerging in China, which also include other services such as Short Messaging Service (SMS), pre-paid mobile phone cards and internet cafes (Cartier et al., 2005; Qiu, 2006, 2007; Qiu and Zhou, 2005). These are low-end technologies with low prices, whose service quality may not be guaranteed. However, they have been growing phenomenally, constituting ‘the key development’ in China’s new urban mobility patterns (Cartier et al., 2005: 14). Together, they serve the ‘information have-less’, ‘an informational – and therefore social, economic and political – category in the evolving network society, which sensitizes us to a new set of phenomena, problems and policy options’ (Cartier et al., 2005: 10). The ‘have-less’ are people with lower socio-economic status, such as the unemployed, retirees, students and migrants, who have begun to adopt information and communication technologies (ICTs) on a massive scale.

A close look at Little Smart provides a good opportunity to explore the general issues and questions regarding working-class ICTs and the well-being of the information have-less. Although each working-class ICT is distinct and China is but one of many Asian countries, an in-depth examination of Little Smart is a necessary first step toward grounded theorization. For only through the peculiarities of particular information services can we piece together the larger picture of working-class ICTs with insights about the technosocial reality that go beyond a single unitary modernity.
Several research questions are posed with regard to the case of Little Smart to further our understanding of working-class ICTs empirically and conceptually:

How did Little Smart emerge so rapidly?
What are the formation processes of this low-cost wireless technology at the transnational, national and local levels?
How did major commercial stakeholders – China Telecom, China Netcom and UTStarcom – interact with national regulators and local state authorities in these processes?
How do Little Smart subscribers perceive and evaluate the service? How are they using it, and for what purposes?
Are they involved in the technology formation processes, if at all?
What are the problems in the development of Little Smart? Why?

Due to a general lack of scholarly research on Little Smart, this article draws on three types of data to answer these questions. First, Chinese-language materials from primary sources were collected and analysed, including news articles, official documents, IT industry reports, company profiles and a book-length collection of journalistic reports on Little Smart (Lin, 2005). Second, from 2002 to 2005 a series of face-to-face and telephone interviews were conducted with Little Smart subscribers as well as mid-level executives involved in the research and development (R&D) and marketing of the technology. Third, in 2004 and 2005, two focus groups were held among Little Smart users in Zhaoqing and Shanghai. Zhaoqing is a small city in South China, where the first commercial Little Smart service was launched in 1998. Shanghai, on the other hand, was the last big city to have Little Smart in 2004.

THE SERVICE AND ITS DIFFUSION
‘Little Smart’ is only one of many names for this wireless service, which is delivered mostly via conventional landline telephone systems using a combination of specially designed base stations, controllers and management software as the last-mile solution to transmit voice and data to and from inexpensive wireless handsets. The officially designated name by China’s Ministry of Information Industry is ‘wireless city phone’ (wuxian shihua) in order to categorize the service as part of the landline market in regulatory terms. The most popular term, ‘Little Smart’ was originally the main character’s name of a popular science fiction series by China’s most accomplished sci-fi writer Ye Yonglie (Lin, 2005: 45). The fictional name first became a brand of UTStarcom, which brought the technology from Japan to China. It was then adopted by the landline operators, China Telecom and China Netcom.

Because the service began as a localized operation in late 1990s, it was named differently by the local branches of China Telecom such as City Phone
Connection (*Shihuatong*) in Shenzhen and Duanzhou Connection (*Duanzhoutong*) in Zhaoqing, a city whose ancient name was Duanzhou. Meanwhile, there are an array of informal derogatory terms created by subscribers to refer to Little Smart due to its low service quality, at least during the initial years. These include nicknames such as ‘Hello–Hello Call’ (*Weiweiko* – because users are always saying ‘Hello, hello?’), ‘Toilet Connection’ (*Shikengtong* – to indicate the very low standard of service) and, in the city of Zhaoqing, ‘Duanzhou Disconnected’ (*Duanzhousai*). Although most of the disparaging names are no longer in use due to the improvement of services, Little Smart’s multiple names, together with those assigned by regulators and telecom operators, reflect the complexity of technosocial issues involved in the formation of this working-class ICT.

In technical terms, Little Smart is known as the Personal Access System (PAS) developed by UTStarcom on the basis of Japan’s Personal Handy-phone System (PHS) (Liu, 2004). It is a variant of Wireless Local Loop (WLL) technology, which includes the Digital Enhanced Cordless Telephony (DECT) system in Europe and its modified version, corDECT, in India as well as the Cordless Telephone second generation (CT-2) in Korea. But like the PHS in Japan, all these low-end wireless technologies have been unable to achieve a similar growth result as Little Smart in China (Castells et al., 2005; Yuan et al., 2006).

Little Smart is a limited mobility service. Its subscribers cannot roam beyond city limits because most handsets do not have a SIM card and the spatial range of coverage for each Little Smart base station is limited to hundreds of metres in radius, as opposed to ordinary cellular base stations which can cover areas kilometers or tens of kilometers away (Tan et al., 2005). The Little Smart signal is also less reliable and less clear, especially in moving vehicles, compared with the Global System for Mobile Communications (GSM) and Code Division Multiple Access (CDMA) system. As a result, a widely observed usage pattern is that people carry two handsets: a Little Smart phone for not-so-important calls and a regular mobile phone for important ones (for example, with one’s supervisors or clients). Meanwhile, Little Smart’s services tend to be limited: subscribers in most cities could not send or receive SMS on their phones until 2004. Although advertisements claim that Little Smart allows for low-cost international calls, one focus group participant in Shanghai complained that he was never able to use this function. Finally, because Little Smart handset makers try to lower production costs, some basic functions of mobile handsets, such as the silent and vibration modes, are not provided in certain low-end models, thus making the user experience significantly inferior.  

Despite these drawbacks, the diffusion of Little Smart has been exponential, increasing from 0.6 million in 1999 to 91.1 million in 2006 (Figure 1). The average annual growth rate is significantly higher than regular mobile phone services (Figure 2). While it took seven years (1993–2000) for
GSM subscription to increase from 1 million to 50 million in China, it only took Little Smart five years (1999–2004). Although since then the growth rate for Little Smart dipped to 6.8 percent in 2006, as opposed to 17.3 percent for regular mobile phone, this wireless working-class ICT has already registered most impressive expansion in the first half decade of the new century.

Price is a key factor that drives growth. Because the service belongs to landline business in regulatory terms, Little Smart subscribers only need to pay when they call or send messages to others, whereas two-way charging is applied for regular mobile services. Thus, the operational cost is halved. In some cities, Little Smart users can pay a monthly flat rate of about $8 for unlimited airtime while GSM or CDMA users need to pay more than $12 for 200 to 270 minutes airtime per month (Liu, 2004; Tan et al., 2005). The Little Smart handset is also much cheaper. As opposed to ordinary mobile handsets costing from $100 to about $850, the price range of Little Smart phones ranges from under $50 to about $170. All the participants and focus group participants who began to use the service from 2002 onwards paid under $100 for the handset. During promotional periods, several of them paid under $30 to get the phone, while some others got handsets for a nominal fee of $0.12, or even totally free after signing a one-year contract and pre-paying amounts of airtime expense for the coming year (about $60 in Shanghai and $36 in Zhaoqing). Little Smart users in Wuhan (central China), Shanghai and Hangzhou (east China) also reported that they used pre-paid internet

- Figure 1 Year–end total for Little Smart subscribers in China, 1999–2006 (million)


- Figure 2 Annual subscriber growth rates of Little Smart and regular mobile services (GSM and CDMA) in China, 1991–2006

protocol (IP) services in addition to Little Smart to bring the cost of domestic long-distance calls down to less than one cent, which is even less expensive than local calls through a landline.

How could Little Smart have such a price advantage? Besides one-way charging, PAS technology contains a few features to reduce infrastructure cost as it was designed initially to cover small areas such as a building or residential complex. First, it uses switches for the landline network and ‘requires no modification to the central switching office, nor does it require investing in mobile switching hardware’ (Frost and Sullivan, 2003: 7). Second, it is can be scaled to fit areas of different user density, which varies greatly in Chinese cities.5 Third, it is relatively easy to set up. Landline operators only need to add the base stations, some controllers and management software to their existing networks (Tan et al., 2005). It only takes three to four months to deploy Little Smart in a large city of 10 to 12 million potential users (Frost and Sullivan, 2003).

From the perspective of subscribers, although low cost remains the main reason for adoption, participants in the focus groups in Shanghai and Zhaoqing reported that another of their considerations was the health risk caused by mobile phone radio wave emission. They believed that Little Smart has much lower emissions than GSM and CDMA, which resulted partly from commercial promotion launched by service providers. The belief is reinforced by the fact that the battery of Little Smart phones usually lasts longer, which is a major advantage for users. A focus group participant in Shanghai, for example, revealed that she only needed to charge her Little Smart handset once or twice every week, whereas regular mobile phones often need to be charged every day. These handsets, made in China in most cases, usually have a sleek look hardly distinguishable from ordinary mobile handsets. They also tend to be lighter in weight.

Most importantly, the reliability and service quality of Little Smart systems have improved significantly in recent years, especially in smaller cities. In Zhaoqing, local China Telecom executives boasted that their Little Smart works well in moving vehicles. One participant in the eastern city of Ningbo is a widowed pensioner living by himself. Without a landline at home, Little Smart was his only telephone. He chose to do so because the service was reliable enough for him to conduct all his life activities through Little Smart, including arranging gatherings with families and friends and using it as his lifeline. However, not all cities have such a high level of service reliability, especially in major metropolitan centres such as Beijing and Shanghai, which are late adopters of this low-end technology.

Finally, working-class consumers like Little Smart because ‘limited mobility’ is a feature that reflects their daily life patterns. According to a survey by China Post, 80 percent of the Chinese population spends 80 percent of their time within their respective city limits (China Telecom, nd). Shopkeepers in a
local store, university students, pensioners, factory workers – many of these people need to move around within the city but not to far flung places, at least not frequently. As a result, in the initial stage of Little Smart deployment there were many instances where supply could not meet demand (Lin, 2005). Hence in most cities, subscription was limited to those who were registered as local long-term residents, including micro-entrepreneurs (many of whom were unemployed), students and retirees. These groups of information have-less remain the bulk of the market today. Meanwhile, the restriction on residential status has been relaxed in recent years to appeal to a wider scope of users, especially migrant workers.

CO-EVOLUTION OF MARKET AND POLICY

A few key transformations have been underway in China’s telecom industry, setting the stage for the emergence of Little Smart. The first and most profound transformation is the overall modernization of the national economy, which has led to growing geographical and social mobility among all classes, including the information have-less. A new set of market dynamics emerged given the country’s continuous economic boom, on the one hand, and tremendous informational demands of the have-less, on the other (Cartier et al., 2005). Being uprooted from rural villages and state-owned factories, these people need to adapt to rapid social change. They are in search of employment and education opportunities, social support and networking resources to meet daily informational needs in housing, transportation and health care, which collectively create the new ICT market. It is within this structure of social stratification and the growing consumption capacity of the have-less that Little Smart has become a popular technology.

Meanwhile, the country’s telecom market has been reformed from a single state monopoly to limited competition among four players including two landline operators (China Telecom and China Netcom) and two mobile operators (China Mobile and China Unicom), all of which remain state-owned but are now listed on stock markets. The real change here, when it comes to providing connectivity to low-income communities, is not deregulation or liberalization, but the receding universal service commitment and the reshaping of the telecom industry based on the logic of profit maximization (Zhao and Schiller, 2002). In this process there is a partial opening up which allows for more competition within the domestic market and more international participation including not only global telecom giants, but also emerging transnational players such as UTStarcom.

Much has been written on the reform of China’s telecom policy and telecom market since the early 1990s (e.g. Guan, 2003; Lee, 1997; Mueller and Tan, 1997; Xu and Pitt, 2002). It is only necessary to recount the most essential developments to show the shifting emphasis from universal service to average revenue per user (ARPU). This is a decade-long transformation to
which the case of Little Smart belongs. In 1993 China Telecom, the only state monopoly since the funding of the People’s Republic, began to be separated from the Ministry of Post and Telecommunications. The Ministry of Post and Telecommunications was merged with the Ministry of Electronic Industry to form the Ministry of Information Industry in 1997. In 1998, China Telecom was stripped of its mobile communication division, which became China Mobile, by far the largest wireless provider in the country. This was followed by the transference of half of China Telecom’s assets into the ownership of China Netcom in 2002, thus creating two similarly sized landline companies.

While the reshuffling proceeded, landline business came under tremendous pressure to increase profit, measured by ARPU, because both China Telecom and China Netcom began to be listed on stock markets including the New York Stock Exchange. The landline market was growing slowly with very little, if any, ARPU increase. Yet sales for mobile phones and services grew in leaps and bounds, with total subscriptions increasing from 43 million in 1999 to 207 million in 2002 and the emergence of a series of value-added services such as SMS, ringtone downloads and General Packet Radio Service (GPRS), all helping to boost ARPU in the wireless sector (Xu, 2004). Sharp contrast between the lucrative wireless market and unimpressive growth in the landline sector created the major incentive for China Telecom and China Netcom to offer limited mobility services.

However, the emergence of Little Smart resulted as much from the policy environment as the market situation, including both formal policymaking at the national level and more practical and sometimes informal processes of policy implementation at the local level (Jiang, 2003; Liu, 2004). On this dimension it is essential to acknowledge that multiple policy rationales have been interwoven to produce the complex and uneven development of Little Smart, and that these rationales do not have to be consistent with each other for they emerged from particular policy contexts, local or national. Indeed, the most critical factor in this process is the capacity for landline service providers to operate at multiple scales, taking advantage of long-existing centre–periphery tensions in the political system and the ability to scale the technology.

Figure 3 summarizes the trajectory of policy change with regard to Little Smart at the national and local levels. Underpinning this series of events are three crucial processes, the first being the lingering of China’s socialist commitment to universal service, at least in the initial years of 1996–9. During this period, China Telecom began to experiment with this low-cost solution in order to increase telephone penetration in mountainous areas (Liu, 2004). At the time, there was little pressure to pursue higher ARPU; neither was there much recognition for the significance of working-class ICTs. The main reason was because China Telecom attempted to use the wireless ‘last-mile’ solution to reduce infrastructure and operational costs so that telephone penetration could grow faster in mountainous regions.
This happened to meet the needs of some local governments because telephone growth is among the major criteria for evaluating local state performance. Hence, in cities where the relationship was particularly strong between local officials and the long-time state monopoly, China Telecom, the two sides would want to work together to foster Little Smart regardless of discouraging or prohibitive national policy.

First, it is important to note that Yuhang and Zhaoqing, where Little Smart was first launched, are not just any small cities. They are located not far from the central metropolises of Shanghai and Guangzhou in the country’s two wealthiest regions, the Yangtze River Delta and the Pearl River Delta,
respectively. Such a location ensures relatively easy access and control by China Telecom in the processes of constructing, maintaining and modifying the technology. The local governments here also control more resources compared with most other small cities, while enjoying relatively more latitude in policy implementation. Moreover, because the two deltas sustain China’s most globalized regional economies (Cartier, 2001), the market demand is also stronger than elsewhere.

Second, however, Little Smart encountered strong resistance at the national level, as testified by the Ministry of Information Industry’s repetitive request to suspend the service or raise Little Smart prices during 1999 and 2000. Both China Mobile and China Unicom, the two main mobile operators, campaigned vehemently against Little Smart for fear of competition. At the same time, central decision-makers in Beijing hesitated to support Little Smart because it was believed to be ‘outdated technology’, and the spectrum used by Little Smart reportedly overlapped with 3G communication (Bao, 2004; Jiang, 2003; Yuan et al., 2006). What the national regulators did at this time was to issue the abovementioned ordinances to appease the mobile operators at least for a while, whereas the Ministry of Information Industry did not really halt all Little Smart projects, whose number continued to rise throughout China (Kuo, 2003). Such a loose way of implementation was taken as a de facto green light in local state practices. When the February 2001 Ministry of Information Industry ordinance came out, ruling that Little Smart could not enter big cities, this was a sign of recognizing Little Smart in small cities.

Third, the process, which is a joint consequence of the first two developments, has a spatial pattern of Little Smart diffusion known in China’s telecom industry as ‘countryside surrounding cities’ (nongcun baowei chengshi), a phrase borrowed from Chairman Mao’s military strategy. To be precise, Little Smart began in small cities rather than the rural countryside. But this metaphor vividly reflects that the service was first available in the more ‘peripheral’ places before entering urban centres such as Beijing and Shanghai. Moreover, the development, especially in its early periods in small cities such as Zhaoqing, was marginally legal, sometimes completely underground, subverting the official regime from its fringes, in ways similar to Mao’s guerrilla war.

‘Countryside surrounding cities’ was not a deliberate choice by China Telecom or UTStarcom. Were they given the chance to choose, Little Smart probably would have entered Beijing and Shanghai first. But it began with the decision of the Ministry of Post and Telecommunications to import PAS in 1996 under the promise that it would help to enhance teledensity in remote areas (Liu, 2004). Hence, it began in relatively peripheral places, but not too far from the big cities. Meanwhile, there was considerably less resistance in small cities, where China Mobile and China Unicom had barely entered, not to mention existing working relationships with the local state. National decision-makers were also more likely to tolerate the situation as temporary experiments
in third-tier cities, where teledensity was low anyway. Thus Zhaoqing and Yuhang became the first small cities for such ‘localized’ experiments.

In 1999, Kunming and Xi’an were the first two provincial capitals to adopt Little Smart, both of which are located in inland western China (Jiang, 2003). At this time, according to Duncan Clark, the process of legalizing Little Smart had gone ‘from a policy of “grow quietly, but grow” to one of almost no regulation at all’ and ‘the ministry line now is, “We will neither support nor hinder”’ (Kuo, 2003). In May 2004, following Beijing and Guangzhou, Shanghai finally began to provide Little Smart service. Hence the triumph of the ‘countryside surrounding cities’ strategy – unplanned, accidental and ad hoc as it was – within the context of multi-scale co-evolution between policy processes and market dynamics.

THE TRANSNATIONAL OPERATIONS OF UTSTARCOM

In addition to its national and local dimensions, the rise of Little Smart involves major transnational operations as represented by UTStarcom, a company founded by returning overseas Chinese students in the USA, which played a central role in the formation of this working-class ICT. There are certainly other transnational dynamics, such as the listing of China Telecom on the New York Stock Exchange or Ministry of Information Industry’s changing policy priorities, which were shaped partially by the transnational discourse emphasizing competition in telecommunications. However, UTStarcom is remarkably different from China Telecom and the Ministry of Information Industry as a transnational player in and of itself, as shown by its history, management team and corporate positioning.

As the leading equipment provider, UTStarcom represents a third force that is crucial to the co-evolution of policy and market other than telecom operators and state policymakers. With the rapid diffusion of Little Smart, a number of manufacturers such as ZTE, Huawei and 25 mobile phone firms have all entered this market, producing a range of products, including more than one hundred models of Little Smart handsets (Liu, 2004). There is an entire production chain for the Little Smart business, which carries considerable political clout that influences policymaking and implementation. Meanwhile, with the multiplication of equipment providers, the market share of UTStarcom has declined to 65–70 percent, although it continues to play a dominant role.

In retrospect, the development of UTStarcom looked like a textbook example for successful telecom start-ups with its annual revenue growing from about $10 million in 1995 to $2929 million in 2005 (Figure 4). Although the company invests in other businesses such as broadband internet access and has ambitions in such markets as India, Japan, Taiwan and the USA, its development trajectory matches closely the expansion of Little Smart in mainland China, with a most impressive growth between 2000 and 2003 and a slow-down of growth rate since 2004.
How did UTStarcom grab the opportunity offered by Little Smart and become the main equipment provider? What is unique about this company? The answer lies in UTStarcom’s transnational operation, especially in connection with Japan and the USA. Returning overseas Chinese students, as the spearhead of transnational ‘brain circulation’ (Saxenian, 2005), have been very active in China’s telecom industry. UTStarcom stands out from other companies founded by returning students because, while most companies of this kind only have certain kind of connections to the USA, UTStarcom enjoys support from players in Japan and the USA, especially Masayoshi Son’s Softbank in the case of the former.

UTStarcom has been a transnational enterprise since its inception. Although most of its revenues come from mainland China, its global headquarters are located in Alameda, CA. The company has eight R&D centres around the world, including three in the USA (New Jersey, California and Chicago), four in China (Beijing, Hangzhou, Hefei and Shenzhen) and one in India. It has 30 branch offices not only in China and the USA but also in Australia, Germany, India, Israel, Japan and Vietnam. In April 2003, UTStarcom had close to 4200 employees, including about 700 in the USA and 3400 in China (see www.utstar.com).

The senior management team of UTStarcom consists of four core members – Hung Lu, Ying Wu, Bill Huang and Johnny Chou – all of whom were former overseas Chinese students in the US. The remaining six members of the management team are of American and European decent, including mostly managers from American high-tech companies such as Lucent, 3M, Cisco and a former official from the US Commerce Department during the first Bush Administration.

Within this team, the key character is Hung Lu, the chairman and CEO of UTStarcom. Born in Taiwan, Lu moved to Japan at age six and went to the University of California-Berkeley, where he also gained entrepreneurial experience. He founded Unitech in 1991 and merged it with Ying Wu’s Starcom to form UTStarcom in 1995. Lu has strong Japanese connections.
because he is a close business partner of Masayoshi Son, Japan’s leading IT investor, who regards Lu as his ‘blood brother’ since the two became friends at Berkeley (Global Entrepreneur, 2004). Son’s Softbank provided the first major venture capital of $30 million for UTStarcom in 1995, although the annual sales revenue of the company was only $10 million. Without Lu’s connection with Son, it would have been difficult for UTStarcom to raise such an amount of venture capital from any investor.

The Japan connection proved vital when UTStarcom began to import PHS equipment and handsets from Japan while making modifications on the technology to create its PAS system. Notably, the company did not have its own model of Little Smart handset until late 2001, and it is only since then that UTStarcom had invested more heavily in adapting the technology to the needs of the local markets, for example, by making more powerful base stations. Given the unstable policy environment at the time, the reliance on Japan for technology transfer was crucial.

UTStarcom also draws heavily from its US operation given the company’s history, research and development centres and branch offices in America, although there are two particular aspects that need more emphasis. First is the listing on Nasdaq. When UTStarcom completed its IPO on Nasdaq on 3 March 2000, its stock price soared 278 percent on the first day. The continual progression of UTStarcom’s performance on Nasdaq was parallel to the growth of Little Smart in China, where subscriptions increased by 362 percent during 2000 and 2001. Thus strong signals were sent to the company’s management team that it should capitalize on the Little Smart business and invest more in the research and development of PAS. Second, when UTStarcom expanded at a later stage into other markets such as Taiwan and Vietnam, it always used the corporate identity as an American company in order to gain more trust from international business partners.

It was the combination of these various transnational factors – in terms of technology transfer, venture capital, stock market investment and corporate identity – which made UTStarcom a central player in the Little Smart phenomenon. This means that UTStarcom’s leadership role in the limited mobility market should not be taken for granted. It is rather a joint product of the particular China–USA and China–Japan connections overlapping in the organizational structure of the company at the time.

A PREMATURE DECLINE?

The success of Little Smart, as remarkable as it was, needs to be understood with caution. The essence of the above analysis shows that the rise of this working-class ICT owes a host of institutional and historical factors operating on transnational, national and local levels, whose unplanned overlapping, interaction and co-evolution helped to create a conducive situation which happened to meet the demands of the information have-less. The pending
question is, how long can this accidental achievement last? To what extent is the success of Little Smart a ‘shooting star’ (liuxing)’ (Jiang, 2003: 1)? These are salient concerns, since the landline operators and Little Smart equipment providers have realized, painfully, that this low-end market segment, despite its growing size, has been suffering from ‘drastic decline in ARPU’ since 2004 (IT Management World, 2004: 17). A national taskforce was established to ‘save’ Little Smart on 13 December 2004 (IT Management World, 2004), reflecting a sense of crisis that sits at odds with the rapid speed of growth.

As mentioned earlier, similar limited mobility services such as Japan’s PHS, India’s corDECT and South Korea’s CT-2 never took off as Little Smart did, not because the technologies were not good enough or the other countries did not have enough telecom talent. Market demand, especially in India, has been considerable. However, in Japan, for example, the PHS was regulated as a low-end mobile phone rather than part of the landline (Ma and Liu, 2004). The target consumer group is mostly schoolchildren, who tend to be more fashion sensitive than price sensitive and therefore unlikely to be attracted. The interaction of regulatory policy and market dynamic in this case failed to produce conducive conditions.

The case of India illustrates another possible scenario, where the attraction of corDECT has been widely acknowledged as the ‘poor man’s mobile phone’, and whose total subscription increased from about 100,000 in September 2001 to 7.55 million in March 2004 (Department of Telecommunications, 2003–4; O’Neill, 2003). This impressive, but still smaller, scale of growth as compared with Little Smart was achieved under the condition that India’s telecom authorities were much more supportive of this limited mobility service than their Chinese counterparts. While the Ministry of Information Industry was trying to curb Little Smart growth, the Indian Department of Telecommunications issued its guidelines endorsing corDECT in 2001 with an explicit goal in enhancing universal service (McDowell and Lee, 2003). However, the institutional framework for telecom policymaking is less centralized in India than it is in China. Subsequently, mobile operators in India were able to launch a legal challenge against the right of landline operators to provide a limited mobility service (O’Neill, 2003), something China Mobile and China Unicom were unable to do. Given the lower average income in India, the market demand was also smaller. Meanwhile, under the less than favourable legal and market conditions, corDECT systems in India usually cover small places, such as individual buildings or neighbourhoods, rather than entire cities (McDowell and Lee, 2003).

This article cannot provide more systematic international comparison due to the limits of space (see more discussion on this in Castells et al., 2006). However, it is clear that, although Little Smart did well in comparison to similar services in Japan, South Korea and India, it also faces serious problems of its own.
The slowdown of subscription growth (as shown in Figures 1 and 2) is but one indicator of the beginning of the end. As with any technology, the diffusion curve will plateau, but this is more than a situation of natural market saturation. It also results from co-evolving policy and market conditions since 2004.

An alarm signal is sent by UTStarcom’s drastically decreasing profitability (Figure 5). The ratio of the company’s net profit versus total sales revenue was about 11 percent in 2002 and 2003, but it was only 2.69 percent in 2004. As for 2005, the company failed to file its annual report on time, for which it received a warning from Nasdaq for delisting on 22 March 2006 (PRNewswire, 2006a). When the annual report was finally released, the company had a net loss of $487.4 million in 2005. On 16 November 2006, UTStarcom received a second delisting alert for failing to file its July–September quarterly report on time, which cast further doubt on the company’s performance (PRNewswire, 2006b).

The declining profitability of Little Smart results from the fact that, after UTStarcom’s earlier success, both domestic and foreign players had entered the low-end wireless market, creating a new set of dynamics. Responding to the competition posed by Little Smart, ordinary mobile phones became less expensive: for example, the Motorola C115 costing under $50 per handset in August 2005. Mobile service providers also lowered subscription fees, offering less expensive packages, such as China Mobile’s M-zone. In other cases, some local Unicom branches already had begun to use a one-way charging scheme, which technically violated national regulation. The branches, again, tended to be in smaller cities, thus strangely echoing the strategy of ‘countryside surrounding cities’.

Low price is again the key factor underlying the above competitive moves launched by the regular mobile phone sector against Little Smart. Because Little Smart handsets and service packages are inexpensive, the cost is low for one to shift from Little Smart to a low-end GSM service. The same factor that

![Graph showing declining profitability of UTStarcom, 2002–2005 ($ million)](image)

**Figure 5** The declining profitability of UTStarcom, 2002–2005 ($ million)

*Source: NASDAQ.*
contributed to the rapid diffusion of Little Smart a couple years ago may become a disadvantage for Little Smart manufacturers and operators with the heightening of market competition.

Another threat to the sustainability of Little Smart is China’s plan for third-generation (3G) mobile services. A commonly held view in the policy circle is that Ministry of Information Industry will hand out 3G licences soon, and that landline operators will join mobile operators to hold two 3G licenses. As a result, both landline operators, especially their branches in major metropolitan areas, are holding off investments in Little Smart in the anticipation of large-scale development in the 3G market. Meanwhile, there is also the argument that Little Smart is using part of the core frequencies designed for 3G deployment (Yuan et al., 2006). Although some UTStarcom executives maintained that they could make Little Smart compatible with 3G, one can easily foresee the scenario that, when 3G licenses are issued, regardless of whether Little Smart loses its frequency or not, most of the investment by service and equipment providers will be shifted to this new area of growth. The stock market will then respond, exerting pressure on the remaining Little Smart business.

Finally, the informational needs of the have-less are recognized in a post hoc manner for commercial exploitation. They are not acknowledged in order for telecom players to serve working-class consumers, enhancing universal service and promoting upward social mobility. Therefore, there is little institutionalization, especially at the national level, for the mechanisms to protect long-term sustainability of Little Smart – a common problem that probably faces all working-class ICTs. When such mechanisms exist, they tend to be in small cities where the market dominance of Little Smart has been established already. For example, in Zhoushan, Zhejiang Province of east China, local residents can receive a reward of $122 for reporting a blind spot in the city where there is no Little Smart signal. But such a level of commitment to high-quality services is the exception rather than the rule when considering local landline operators throughout the nation. Moreover, such a local mechanism is not backed up by structural guarantees at the national level, where the ultimate policymaking power resides. This means that even the more benevolent local service providers may abandon their current strategies supporting this wireless working-class ICT at another time.

The migration of interests has already begun in the Little Smart industry, moving away from the original goal of capturing the low-end market to the targeting of more affluent consumers. For example, UTStarcom has been pushing a range of value-added products based on Little Smart, such as its mobile internet solution called ‘MiMi C-Mode’ (Xu, 2004). SMS, ringtone and handset wallpaper are among the other value-added services promoted by various local providers, following the same marketing routine used by GSM and CDMA operators which targets the middle class (Xu and Xu, 2004).
In late 2004, some China Telecom and China Netcom employees even proposed to give roaming capacity to all Little Smart phones by a mandatory ‘upgrading’ of the systems on 17 May 2005, World Telecom Day (Shen, 2005). Fortunately, this proposal triggered immediate opposition among telecom analysts and has been postponed indefinitely.

The problem here is not whether Little Smart can be used technically for all the non-voice activities, but whether users need these new services. The unequivocal answer emerging from the interviews and focus groups in this study is negative – most of the Little Smart subscribers do not need these add-ons, except for SMS. From their perspective, it is far more important to improve voice communication signals rather than advanced data services that few will use.

CONCLUSION
This article began with the question: can wireless technology serve low-income communities? It shall end, first and foremost, with a positive note. The strong message sent by Little Smart is that even though public and private stakeholders may not try deliberately to serve the information have-less, it is still possible for low-cost working-class ICT solutions to materialize. The logic of profit maximization, despite its obvious limitations, can create a serendipitous momentum for development-oriented wireless build-up at certain historical conjunctures.

However, such a technosocial emergence is not guaranteed to succeed. It is conditioned by a few factors which may be generalized to other forms of working-class ICTs, pending further empirical investigation. These involve, first, the institutional settings of the telecom regulatory system, including both formal rules and informal practices; second, market dynamics produced by the informational needs and consumption patterns of the have-less populations, shaped by their everyday mobility patterns; and third, the co-evolution of policy arrangements and market dynamics with the main commercial players being situated in an increasingly transnational context.

The process and result of conditioning are historically specific. Hence the ‘accidental accomplishment’ of Little Smart, which does not take us by surprise because, arguably, historical and geographical coincidence has been a key element in the making of Silicon Valley by drawing together specific raw material, capital and labour in a serendipitous fashion (Castells and Hall, 1994; Saxenian, 1994). In the case of Little Smart, it was first initiated as an attempt to promote universal service in the mid- to late 1990s and then transformed into a major source of profit by landline operators and equipment providers during 2000 to 2003. The same pursuit for higher ARPU, in a different period since 2004, can also become a disincentive that hampers the development of this working-class ICT.
Equally important is the spatial dimension of the technology, which shows that, above all, wireless mobility can be localized; and that localized mobility can suit the daily life patterns of the information have-less very well. Moreover, the rise of Little Smart involves a complex scaling process from the transnational to the national and then to the local level of operation. We have only begun to explore these scale relationships, although one suspects that the most crucial operational scale would be the local state, especially city governments, whose power in policy implementation and the social shaping of the technology was shown in the diffusion process of the 'countryside surrounding cities'. To what extent this pattern applies to other working-class ICTs is a question deserving future research.

The overlapping of historical and spatial conditioning explains why large cities such as Beijing and Shanghai lag behind smaller cities in terms of their local Little Smart service quality. This creates a major drawback because the large metropolis is the centre of urban development, where have-less populations are concentrated to serve an increasingly transnational economy. But in some of these places where market demand is the highest, the actual quality of Little Smart service is the lowest, creating one of the most troubling problems regarding this working-class ICT.

Sustainability remains the most formidable challenge. Based on the combination of conducive factors at the transnational, national and local levels, the success story of Little Smart is essentially an accidental achievement based on the serendipitous match between state and enterprise interests, on the one hand, and long-ignored market demands, on the other. Recalling that China’s pager subscription, the world’s largest in the late 1990s, fell from 48.8 million in 2000 to 0.97 million in July 2005 (Ministry of Information Industry, 2004, 2005),9 who can promise that Little Smart will not become a disposed technology in a few years? This challenge over time is a key lesson which can be drawn from this analysis of the Little Smart. In other words, in whatever condition ICT services are technologically, the solutions have to be social, involving public and private stakeholders as well as the information have-less themselves. This is probably the most enduring issue emerging from this study, which shall inform future studies on working-class ICTs in Asia and beyond.

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Notes

1. It is important to note that the official number for regular mobile phone users in China does not include Little Smart, which is counted in regulatory terms as part of the landline market.

2. Interviews with subscribers were conducted with people from 15 cities and nine provinces spreading across China’s western region (Sichuan Province and Shaanxi Province), northern region (Beijing and Tianjin), central region (Hubei Province), eastern region (Shanghai, Zhejiang Province and Anhui Province) and southern region (Guangdong Province and Hainan Province). Interviews with telecom executives were conducted in Guangzhou (South China), Hangzhou and Shanghai (East China).

3. Participants of the Zhaoqing focus group included one local government employee and five others from local business enterprises. The Shanghai focus group consisted of five university students and one high school teacher. Although there is a lack of information about the general subscriber profile nationwide, it is confirmed through the interviews and observations here that local business people and university students are two of the main subscriber groups of Little Smart.

4. Interviews with users in Shanghai.

5. Interview with UTStarcom executives in Hangzhou.

6. Participants in the Zhaoqing focus group all recalled the period in 1999 and 2000 when they heard that the Little Smart service in their city would be stopped. Two of them reported that they delayed their plan to adopt the technology precisely because of this ‘rumour’.

7. Interview with UTStarcom manager, Hangzhou.

8. Focus group discussion in Shanghai.

9. See Cartier et al. (2005) for more discussions on the wax and wane of pagers in China.

References


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Tan, Z., S. Chen and X. Liu (2005) ‘Adoption of Limited Mobility Services: Little-Smart in China as a Case’, paper presented at the Hong Kong Mobility Roundtable, Hong Kong, 2–5 June.


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