



Telecoms Infotech Forum

Briefing paper

Next Generation Wireless Services Development in Hong Kong

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Telecoms InfoTechnology Forum

The TIF is an industrial forum run on a regular basis by the Telecommunications Research Project (TRP) at the University of Hong Kong. Dr John Ure, associate professor and director of the TRP, and Dr Peter Lovelock, deputy director of the TRP, are also the directors of TIF. (See TRP Profiles @ <http://www.trp.hku.hk/profiles.html>.) The TRP provides background briefing papers for each TIF and posts these together with presentations and proceedings papers on the website <http://www.trp.hku.hku/tif> TIF is the source of funding of the TRP.

The output of the TRP is public domain research into economic, policy and regulatory aspects of telecommunications and related sectors such as IT, new media, Internet and e-commerce. The output of TIF is a series of industry and policy-focused forums that bring together all interested parties in a non-partisan way. The objective of TIF is to stimulate informed interest in the economic, policy and regulatory aspects of information and communications technologies (ICTs), to foster greater transparency and a better understanding of the economic and technological dynamics of the sector, and its impact on social welfare.

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Introduction: Echoes of an Ecosystem

For the past decade Hong Kong has been a world leader in mobile cellular, and widely regarded as a testbed for the industry globally. Cellular has put Hong Kong on the world map. The sector contributes around 2 per cent to GDP, and on TRP estimates the multiplier effects can add (or subtract) nearly 5 per cent to the GDP rate of growth.¹ With unemployment in the Hong Kong economy over 7 per cent, it is in Hong Kong's interests that this sector thrives in the era of broadband mobile communications, creating jobs and tradeable services in the applications side of the business.

The shift in the telecommunications business globally from “narrowband” to “broadband” markets poses challenges for networks and equipment vendors, service providers and regulators alike as voice-centric services give way to Web-centric and data services. At the heart of this shift lies the need to develop compelling content and enterprise-relevant applications. Hong Kong can call upon a rich tradition of media content and IT development to take advantage of this new growth sector. But to make this happen Hong Kong also needs to develop a wireless industry “ecosystem” to foster and promote this development. By “ecosystem” we mean a regular networking of interpersonal communications along the wireless sector value chain that goes beyond the purely impersonal market relations of the value chain. The latter is remote, indeed it can be global, while the former is neighbourly and local, and is likely to reward innovative thinking at all levels.

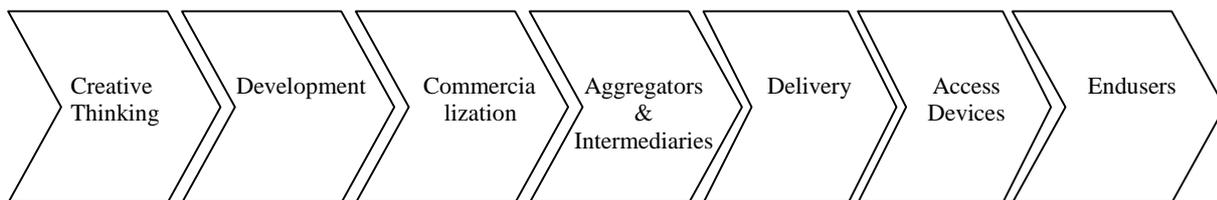
Next Generation Wireless Content Development

Wireless content and application development is changing the economics of the industry by placing innovation outside the corporate boundaries of mobile network operators. As a result, the wireless content value chain is playing an even more critical role in determining future business success. The value chain is itself a series of intertwined value chains, with multiple components, entry and exit points, and levels of engagement. The different links work and talk with one another in many ways, either impersonally through market mediation or personally through localized interaction. This briefing paper lays out the various links of the wireless content value chain and

¹ For example, if GDP grows at 4 per cent, the mobile industry contributes nearly 0.2 per cent of that 4 per cent.

summarizes the pressing issues that bedevil the different players, in general and in Hong Kong in particular. Roadblocks – or “bottlenecks” in the value chain – can be surmounted through content developers, hardware and software vendors, and network operators creating, facilitating, and participating in the right types of networks, or “ecosystems.” Compared to countries like Japan and South Korea, Hong Kong’s wireless content ecosystem is in its infancy, thereby presenting the Hong Kong government with an opportunity for positive intervention.

The Wireless Content Value Chain



One: Creative Thinking

The starting point is content creation or the brainstorming of novel ideas – marked by their originality (games) or lack thereof (ringtones) – for wireless content. In this respect, Hong Kong has numerous creative sources and a good track record. It is blessed with a long history of film, advertising, music, and fashion creation. Films such as “Storm Riders,” “Shaolin Soccer,” and the forthcoming “DragonBlade” show off Hong Kong’s prowess in digital FX and computer-graphic animation. On the downside there has been much criticism leveled at the education system in Hong Kong for not promoting creative thinking. As one of the speakers at the TIF on Digital Entertainment put it “[Students] are great at memorizing textbooks [but] we are looking for the ones who will tell us ‘the story behind the picture,’ that have that creative ability.”² Silicon Valley is a place that has successfully created an ecosystem – or a massive “external innovation network” – to encourage the open flow of ideas and the successful cross-fertilization of different disciplines and industries. Yet it remains true that in Hong Kong the universities still cannot collaborate with one another to run multimedia

² TIF, March 2002: <http://www.trp.hku.hk/tif/papers/2002/march/0203summ.pdf>

training programs which leverage their individual strengths in computer science, computer graphics, communication technologies, media studies, fine arts, drama, and music through the transfer of college credits.

Other Issues

- Dearth of good ideas
- Engagement in cross-disciplinary knowledge exchanges
- Creating and “maximizing” a general culture of innovation, creativity, and openness
- High risk, tension, and plenty of speculative efforts in search of the next “new new thing”

Two: Development

The second link is the software development process, or putting those ideas for wireless content into practice. The people in demand are good software developers – “these far-out, rap-talking guys who go snowboarding and have parts of their bodies pierced” in the words of one American mobile operator – who understand the intersection between Web technologies and the wireless world. In this respect, Hong Kong universities, like HKUST, HKPU, City U, and Baptist University, are graduating good programmers. The more pressing issue is the lack of homogeneity in wireless content development platforms. There is a confusing array of heterogeneous programming standards (themselves only in the early stages of maturation) – see Table 1. Some are open while others are proprietary and smaller in scale. Developers are in dire need of drastically improved programming API (Applications Protocol Interfaces) and documentation from software vendors and network operators. They also need more timely information about the latest access devices and a better grasp of mobile features, including just how dependable wireless network connections are for data transfer.

Other Issues

- Each operator’s WAP gateway is “closed” and sends conflicting messages back to the developer
- No direct IP support when application passes through WAP gateway, thus data gets “filtered” before returning to handset, creating “tricky bugs”
- It is easier to run an application in offline mode when downloaded to one’s handset rather than in “real time” mode when network is involved because of difficulty of

doing session management between client and server (plus network operators want to keep circuits free for paying voice customers)

- Bandwidth limitations on applications: HK operators' WAP gateways aren't configured to run applications over 100k – keep it “thin and simple”
- Critical application testing & beta versions of applications: need for enhanced user emulation experience
- Developers should be able to query and interact with the network to fine tune their applications: a feedback loop
- Need a standard set of development tools & operators to “open up” their networks (access to customer information that is useful in application development)
- Understand distinction between hype and reality in 2.5G and 3G networks: GPRS “always on” feature in actuality has 4-5 seconds delay
- Dealing with the “complexity of shadows and ad hoc disconnects” which often results in bloated MIDlets (mobile data applications written in Java) that are “intermittently non-responsive”
- Ability to access cameras that are attached to phones and incorporate them into applications
- Difficulty with existing software platforms to do Chinese character encoding needed for reading Chinese script on phone screens (makes phones “hang”)
- Screen utilization & icons: access the whole “canvas” or just 80%
- Sound effects: .wav files are too big so must be sent as ringtone files

Table 1: Adrift in Heterogeneity

Platform	Community	Backers
SMS short messaging	Interoperability begets Asian and Scandinavian teenage SMS “cohorts”	Everywhere but in America
WAP micro browser	Inhouse development & closed systems; WAP Forum	OpenWave
Operating Systems for Multimedia Phones		
i-mode	30 million users in Japan	NTT DoCoMo, AT&T Wireless (mMode)
J2ME (Java 2 Micro Edition)	Java Community Process (JCP): 2.5 million members in Java developer community; Games	Sun, Motorola, Ericsson, Nokia, Siemens, Sprint PCS, IBM, Insignia, Texas Instruments, Philips, RIM, Zucotto
Brew (Binary Runtime Environment for Wireless)	Qualcomm discovers value in software; Qualcomm's existing customer base	Qualcomm, Verizon, KDDI, KTF, Unicom, Hyundai, LG, Samsung, Kyocera

Smartphone 2002 and PocketPC	Microsoft persuasion	Microsoft, Samsung, HTC (Taiwan), recent breakup with Sendo (UK), Orange, PDA manufacturers like Compaq and HP, Dell jumps into fray with Axim X5
Symbian & Nokia Series 60	Fear of Microsoft “siphoning” off bulk of profits	Nokia, Ericsson, Psion, Siemens, Samsung, Matsushita
Palm	Putting the “X” into PDA	PalmSource, Handspring

Three: Commercialization

The third link is commercialization, bringing ideas to the market, and is the critical link in “monetizing” ideas, fanciful or sober. The Hong Kong government recognizes the importance of this cog, and supports several initiatives. The Hong Kong Productivity Council and the Industrial Technology Center administer several incubation programs in wireless content development. ASTRI (the Applied Science and Technology Research Institute) takes a more basic and upstream approach to wireless content by focusing R&D on enabling technologies.

This is also the area where funding sources play a vital role. The Hong Kong government has sponsored venture capital funds to aid innovators, efforts which unfortunately have met with less than stellar results. In addition, after the dotcom bubble burst, venture capitalists and banks have been reluctant to fund wireless content SMEs in Hong Kong. The cost of performing due diligence is no less for an SME than for a larger company with an established product and lineup of customers. In a throwback to the early dotcom days, Hong Kong SMEs have turned mainly to friends and family for angel capital. On the bright side, the minimum funding level to develop many wireless applications is small in comparison to the desktop PC environment.

In general, the two ingredients in any successful venture are (1) the quality of the product and (2) the market potential. For product quality to be assured, not only are good developer skills needed, but also required are good management, marketing, and sales skills. It is on the marketing and sales side that SMEs incur their highest cost of doing business and face their biggest knowledge (“knowing-doing”) gap. As far as market potential is concerned, the structure of the market can become a roadblock. In a large market like Japan there is a dominant mobile player who has benefited from regulatory and policy issues. But NTT DoCoMo’s dominance has led to greater

standardization and the proliferation of diverse content. On the other hand, in a small market like Hong Kong there is fierce competition and an absence of standardization as competing carriers try to differentiate themselves. It is difficult under such circumstances for SME content developers to write an application that can run on all platforms without substantial and costly revisions.

Due to the lack of interest shown by most venture capitalists in HK SMEs and the diminutive size of the local market (defined as the 6.7 million inhabitants of Hong Kong), HK SMEs must focus on access to the Greater China market of Hong Kong, Taiwan, and mainland China. In the long run, the potential realization of this market will be their most critical success factor. In the near term, HK SMEs should not discount the importance of the Southeast Asian market or North Asian market as “stepping stones” to the Greater China market. For now, Southeast Asia remains an easier place to do business and to meet up with entrepreneurs and officials. Places like Singapore are also far more similar to Hong Kong in terms of market scale and demand. In addressing short- and long-term business prospects, the WASP (Wireless Application Service Provider) model, as illustrated in Box 1, is one way forward for HK SMEs into Southeast Asia and eventually mainland China.

Other Issues

- Ensuring Intellectual Property Rights (IPR) protection
- Partnership formation: indiscriminant use of Non-Disclosure Agreements (NDAs)
- Relationship building: time, power, trust
- Direct and indirect engagement with powerful intermediaries and the ecosystems of wireless operators
- Ability to come up with viable idea and business plan (value proposition) that creates a user for mobile operators and ties in to their business models

Box 1: WASP, A Potential Stinger?

HK enterprises are notoriously reluctant to spend money on IT and view IT more as a cost than as an investment. This view has unfortunately been reinforced by the considerable hype and inconsistencies of the IT vendors in the past few years. Thus, in viewing market opportunities there are certain realities that must be frankly acknowledged. HK SMEs cannot realize the economies of scale to compete with established players. And it is doubtful whether HK should risk squandering its resources on becoming a

center of basic high tech development. Instead HK SMEs would be better served if HK concentrated on IT applications. This focus would give SMEs the opportunity to adapt recent IT to local and Asia-wide enterprise needs. IT applications usually only have 2-3 years before they reach maturity. Then the established players step in and throw their weight around. Consequently, SMEs must constantly be expanding into new areas as IT develops and matures.

How could HK SMEs be encouraged to develop into new areas of IT application? This is mainly done through sales. But how to get sales? In Singapore, the government partly subsidizes both the endusers and the SME developers by issuing grants. In Hong Kong, the government did try something similar by putting public money into a couple of VC funds. The problem encountered is that the VCs are not in a position to perform extended due diligence on every SME. Many VCs also know little about the technical aspects of the businesses they are investing in. What happens instead is that VCs give enormous sums of money to SMEs still under development; funds that go wasted on too rapid an expansion (due to slack controls and an elusive grab for marketshare or “eyeballs”) before firm orders for products are forthcoming.

The major problem facing SMEs is finding the customer. Here, it has been suggested that the HK government could do several things to nurture innovative SME developers. It could subsidize actual sales by giving an SME developer a grant when they actually have a customer ready to sign on the dotted line. This would be akin to putting money into a real sale and the grant could be made in the form of a soft loan. The other move is to encourage SMEs to offer enterprise services rather than hardware – i.e. to become a Wireless Applications Service Provider, or WASP. The WASP model gives SME users the agility to expand into new IT areas by offering them the opportunity to buy the service rather than the hardware and software of the product. This is seen as a way to create a market that otherwise local SMEs would not want to pay for.

A WASP could be combined with an MVNO operation (see Point Five for more on MVNO model).

Four: Market Makers

The fourth link is the aggregators and intermediaries – the “market makers.” These are firms which not only package, aggregate, and market content but also serve to create market demand for more advanced handsets and wireless applications. Especially at the outset, when the market is still immature and ill-defined, market makers play a key role in crafting opportunities for content SMEs. When the market structure is not fully developed, the major problem facing SMEs is the prohibitive cost of gaining access to potential customers, especially on the enterprise side where search and acquisition costs are high. Market makers, with their greater resources, can help SMEs find enterprise

customers. For example, a market maker can outsource the development work on a “suite” of wireless enterprise solutions to specialist SME software companies. It later packages the various software pieces with other bundled services into a convenient “one-stop-shop” solution for large manufacturers or retailers. Another example is provided by the creative use of Tetra radio trunk technology – see Box 2.

Market makers are active in three distinct market possibilities: consumer, enterprise, and e-government.

In the consumer market, one has seen an explosion of short messaging (SMS) and applications built on the SMS platform. Many predict that multimedia messaging (MMS), SMS coupled with the ability to transmit digital images and photos, will be the next big consumer hit, once wireless networks are upgraded to higher data speeds and MMS-enabled handsets are introduced on a wide scale. Others speak about the popularity of consumer applications that allow for “killing time,” such as games. In the end, what people will download to their handsets is extremely difficult to forecast. In truth, there is no such thing as a “killer application” on the consumer side. [“The killer application syndrome was a dream of the nineties. What you have is mass customization or providing 10,000 applications to the customer, a market where everyone’s got their own killer application.” – American wireless operator] In such a “hyper” environment, one can conceivably envision an enduser perusing data through their broadband mobile device, finding the information useful, and downloading it to their broadband PC at home – in part because large downloads to mobile handsets are impractical, in part because the broadband PC monthly bill is far cheaper. “Pervasive” broadband adds up to a *greater* service for the consumer and will drive demand for unified billing.

In the enterprise market, there is far greater concern with the issues of security and standards – all the more heightened against the backdrop of a global recession. Some major business endusers of IT in HK have expressed concern over standards as a reason for freezing IT investment. But it is a far more straightforward proposition to measure IT “value” in the enterprise market than in the customer market. For the enterprise user, the pitch is about “making time” (more time through the application of IT to do more sales) or saving money through the “ROI sale.” Thus, enterprise applications are geared

to solving, amongst other things, billing, customer tracking, and procurement problems. Potential heavy endusers are utilities, logistics firms, and financial services organizations, doing parts B-to-C and parts B-to-B.

Box 2: Tetra Outside The Box

Tetra wireless network technology could be deployed in a “market maker” manner. Tetra is currently used (in a PBX or VPN mode) by emergency services world-wide and the HK police force. Tetra digital trunk radio would allow for enterprise applications, specifically tailored to the data needs of the HK police, to be hosted on a network server or enterprise server. In this sense, the HK police becomes a “market maker.” In the US, Nextel uses iDEN technology, the American equivalent of Tetra, to offer a “direct connect” service where by the press of a button on the side of the handset a single dispatcher can broadcast a message in “walkie-talkie” fashion to more than 10,000 truck drivers – [Financial Times (November 3, 2002)].

A third important market is e-government, or government-to-citizen services such as those offered in Hong Kong by ESDLife. It is a privately-run company established in 2000 under the Hong Kong government’s Digital 21 strategy to maintain a Web portal delivering online government services, like booking marriage dates, purchasing government publications, booking sports and leisure facilities, and registering to sit for public examinations. The site has been extremely popular for searching job vacancies in Hong Kong (www.jobs.gov.hk). One could also expect people to regularly use their handsets to make appointments with the social welfare or housing departments. In this regard, particular government concerns with security can sometimes be overblown. For simple transactions such as booking an interview the need for security is low.

Transactions requiring a higher level of security can be done over a secured PC line. Enabling certain government services to be conducted wirelessly is about giving the informed consumer the right to choose what access medium they want to use. Lastly, halfway between the customer and enterprise markets is government procurement, or B-to-G services. Looking across the border, B-to-G has enormous potential in mainland China. The HK government should set a positive example by actively rolling out e-government wireless applications and thereby become a “market maker” in its own right.

The trend in convergence on content, as noted above, also draws attention to the issue of fixed-mobile convergence. That it no longer matters whether the content is delivered over mobile or a fixed network has serious regulatory and commercial implications. Currently there exist different sets of regulations for fixed and mobile network operators. The Hong Kong regulator will have to grapple with the issue of convergence between fixed and mobile regulations. Network operators will have to grapple with convergence between physical networks on the ground and striving for the right type of company regarding firm structure and asset mix.

Other Issues

- Revenue share model and third-party billing resolution
- Network access
- Finding the right mix of middleware providers that offer content conversion tools from wireline to wireless: synchronization, integration, customization, filtering, compression, content repurposing, security, accommodation of multiple data and OS formats
- Forecasting demand and profitability, both highly uncertain variables
- Aggressive or passive aggregation

Five: Delivery

The fifth link is the network operators, those who distribute content over their networks. They are struggling with the issue of stimulating the development of new applications that leverage wireless capacity. In the initial deployment of WAP applications, network operators mostly opted for the “walled garden” approach and ended up doing a lot of inhouse application and services development – see Box 3 on the Vodafone approach. In highly competitive markets, networks are pressured to differentiate their service offerings by making service interoperability difficult if not impossible to happen. However, this behavior has the danger of segmenting the market and does not encourage the emergence of a mass market characterized by an application’s ease of use across different operators’ platforms – unlike the NTT DoCoMo approach where market dominance results in standardization, see Box 4. For instance, in a walled garden model the online games proffered by one operator cannot be accessed by the subscribers of another operator. Take-up in a new service or

application has been shown to be far greater when interoperability exists than when it is absent – see the surge in SMS – or when the application resides on a server accessible from any network. Operators in Hong Kong are now trying to implement interoperability for MMS. In doing so, they face two problems: (1) how to sort out billing and (2) technical issues such as different network specifications. Just how sustainable a wall garden model is in Hong Kong is questionable. It risks slowing down the pace of innovation on the wireless content side because a substantial amount of the future consumer market will be made up of quirky applications – “cool wireless applications for some small audience niche, like weather nuts or wine buffs or skate punks” – developed by some “little dude” on their own. Here, openness – “because the Internet after all is a pretty big place” – becomes a competitive advantage.

Box 3: Vodafone Keeps It Inside

Typifying one extreme end, Vodafone has decided to pursue inhouse content development. They create a customized version of well-known applications – like Instant Messaging (IM), calendaring, email, and remote access to corporate information – that are traditionally thought of as wireless data. Even though Vodafone might outsource the actual development work on some of these applications, the final product is branded, maintained, and closely associated with the carrier. In this case, IM becomes Vodafone IM which does not necessarily connect the Vodafone subscriber to any other IM community.

Box 4: While DoCoMo Keeps It Unwashed

“Anyone caught working on an application at DoCoMo gets fired.” – [DoCoMo partner]

Being a virtual monopoly in Japan, DoCoMo is not beset with the traditional carrier fear of commodization and being reduced to a “bit pipe.” DoCoMo represents the other extreme end from Vodafone and does not develop anything inhouse. Instead it offers third-party billing services to application service providers who ride on top of its network. DoCoMo sweeps up many of the applications and services available on the Web, qualifies some for its branded service, and allows its subscribers to make up their own minds what they want to do – “Here is a lot of ‘unwashed’ stuff. Do with it what you want.”

Somewhere in between the two extremes lies the Golden Middle. Many carriers do some inhouse development on a limited number of applications deemed critical to doing business. One example is customer care applications, like “self care” service for customers to manage their own accounts. An operator can cut costs this way as well as raise its customer satisfaction level.

For HK SMEs, a walled garden makes their life difficult, not only because the focus is more on inhouse development than external collaboration. If an SME developing a

game application decides to go it alone, it must get a server, do its own marketing, do its own billing, and deal with the bad debt problem on its own. The SME incurs all the costs involved in running a business. In working with a network operator, the above factors partly determine the SME's revenue share. If the network operator agrees to cover the marketing costs and underwrite the bad debt problem, the SME developer will receive less of the revenue share, perhaps around 9%. If nothing is underwritten by the operator, the SME may receive around 25% of the revenue share. Deals vary on a case-by-case basis.

HK SMEs' difficulties underscore the fact that there is no wireless content ecosystem yet in Hong Kong. In the US, Sprint PCS executives periodically participate in "Web-learning trips."

Two weeks ago, we organized a visit by the CEO, CTO, CIO, and CMO of Sprint PCS to visit six companies in the San Francisco Bay area. Three were large, household names. The other three were up-and-comers. Call it a "web learning" trip. These companies are all doing innovative things, not all tied to wireless – one's on the personal financial services side, another is doing work on Internet identity management (profiling), and smaller things. The team had a "mindmelt" for an hour-and-a-half. Such an event is low cost to organize, and the small companies like it. We just "dump" on them: here is what's going on in the wireless industry (according to our biased view). "We want you to see us as your friends." "There is no such thing as a dumb question – since we don't understand your business." It was good to get our CTO face-to-face with these folks.

– Sprint PCS

In Hong Kong there are few if any such face-to-face interactions. HK operators are not knocking on the doors of HK content SMEs to seek their input and capitalize on their energy. This is regrettable because ecosystems have proven useful to American wireless operators, who are far from altruistic in their relationships with the developer community, for several reasons.

Functions Of An Ecosystem
Very early insights into the application space
Threat identifier: help operators learn more about market threats than technology threats: "Developers will tell us they're doing this application on the other guy's network, something which we haven't even noticed or thought about." – [American wireless operator]
Protect operators from being surprised by rapid change in the wireless sector
Better knowledge of customer requirements
Source of important feedback: "We like to go to other 'experts' who have different experiences to share

with us. Expertise is what we seek in establishing good partnerships... What kind of expertise do we really need? As a national carrier, we provide access to everyone, business and consumer. We have to support every application for every consumer segment. This is a daunting task. You would need a staff of thousands who are experts on everything. Our ecosystem is very efficient at providing us with good market data, buying criteria, and changing customer requirements. They help us support so many permutations out there.” – [American wireless operator]

Provide filters to weed out vendor propaganda and misinformation

Time to market: crucial partner in the rush to deploy new services

Extension of an operator’s reach

Relationships in an ecosystem, populated by nimble start-ups and established players, can be formal or informal, within organizational boundaries or outside, virtual or incorporating a physical presence. Some of these relationships will be transitory – “short-lived opportunistic responses to environmental changes” – while others become mainstays and truly collaborative. [Institute for the Future, September, 2002]

An important environmental change for HK network operators is the one taking place in China. There are future possibilities around a Mobile Virtual Network Operator (MVNO) model (whereby a service is provided by buying excess capacity from a licensed mobile operator who owns the spectrum) taking root in China. This would offer HK network operators and their content partners an entry into the China telecoms market – see Box 5. The WTO telecoms agreement that China signed allows for up to 50% foreign equity and national coverage in two years time in value-added services – [see the TRP website for a complete listing of China’s WTO commitments in the telecoms sector³]. These conditions are far more liberal than those for basic services where the opening up is a much more gradual and elaborate process. For now, mobile is defined by the Ministry of Information Industries (MII) as a basic service. But there is intense international lobbying pressure to reclassify mobile as a value-added service – by redefining resell as a VAS (similar to the redefinition of a Value Added Network Operator or VAN as a VAS) – thereby opening the door to an MVNO model. International carriers are trying to persuade the MII that they possess the special skillsets needed to make value-added services take off in China and that they will bring in new funding. Foreign telcos can also dangle membership in international roaming packages as an additional sweetener. Until now, there have been one or two temporary MVNOs allowed, between Unicom and a couple Chinese state-owned enterprises

³ See <http://www.trp.hku.hk/infofile/china.html>

(SOEs) – deals which are slated for termination at the end of this year. If the MII were to grant MVNOs, this could be a window of opportunity for HK operators.

Box 5: Chinese Boxing

Content has been a pleasant surprise for Chinese mobile operators. China Mobile saw 28.2 billion SMS sent in the first six months of this year – 8.5 billion alone in June! Distressed Chinese portals Sina, Sohu, and Netease are all of a sudden experiencing tremendous revenue jumps due to mobile data. Yet there are clouds gathering on the horizon. Unicom has entered into a partnership to tap SK Telecom’s wireless data expertise for its “Uni-Info” service. This move is widely seen as a preamble to cutting off its existing content partners. China Mobile has had enormous difficulty building an effective third-party billing engine. Content providers are given a torn piece of paper detailing their monthly revenue shares. Failure to tackle the technical challenge of third-party billing has prevented China Mobile from using (abusing?) its market dominance to adopt the highly successful DoCoMo model. Instead, many SMS content providers fear that China Mobile is starting to “wall” them out by shifting its focus away from Monternet, which works with independent content providers, to the walled garden M-Zone. [Duncan Clark, “Small Fry At Risk As Big Fish Eye Content Sector,” South China Morning Post, September 24, 2002]

Other Issues

- Complexity of building reliable third-party billing engine for wireless data applications in a fast-changing environment: use of middleware to connect to mainframes
- Creating a portal (software interface) for the developer community to equip them with the right set of tools
- Rogue code checks (certification)
- Positive and negative intermediaries: danger of losing “personal touch” with the developer
- Assessing what are and what are not strategic relationships and partnerships
- Role of internal Product Council & Branding & Tariffing for wireless data
- Managing transition to higher data speeds: legacy systems, interoperability, testing

Six: Access Devices

The sixth link are those who build the handsets. 3G device evolution so far has proven to be a nebulous space. The journey was kicked off with an inordinate amount of vendor hype only to be plagued by inconsistencies, severe product delays, product line

gaps, standards battles, and financial turmoil. Problems are now slowly beginning to be reversed – see Box 6. Vendors are jockeying with one another and forming alliances (see Table 1) to persuade software developers to choose between rival camps – a process tabbed as evangelism. Each handset maker has devised their own executable code, making even J2ME portability difficult. Instead of “write once, deploy to many” it has become “write once, test everywhere” as code must be fine-tuned for each phone.

Other Issues

- No dual use handsets (2G/3G)
- 3G standards and costs still “up in the air”
- Getting a handle on device capabilities: form factor, input method, screen resolution, memory, microprocessor, software complexities, etc.
- IP technology in handset (end-to-end)
- Realizing economies of scale & question of vendor financing & testing & handset subsidies

Box 6: Smart Phone Plethora

From a trickle to a torrent... smart phones are starting to “flood” the market in ever increasing numbers. They combine clamshell lids, color displays, elaborate graphics, polyphonic sounds, digital assistants (organizers), multimedia, detachable keyboards, Internet access, built-in cameras and are enabled for GPRS or 1xRTT networks and Brew or J2ME applications. Of course, voice remains the main application. Here’s a quick rundown on new models hitting the streets.

The Brew-enabled Verizon Sharp Z800 retails for US\$399. Three visits to AirInfo (flight schedules) cost US\$0.99 and downloading a theme song US\$1.49.

Sprint PCS’s Samsung A500 retails for US\$300 and comes with a digital camera attachment for an extra US\$70. Monthly US\$10 covers charge for 2M of data downloading & uploading. A user pays US\$3.99 for games like “Monkey Ball” and “Motocross GP” which vibrates the handset to simulate a crash. Sprint PCS also sells the Toshiba 2032 for US\$800, an integrated personal organizer and phone, which can receive emails complete with attachments.

Other new models are the Sony-Ericsson T68i and T300, Nokia 7650, MmO2 Pocket PC, HP Jornada 928, RIM Blackberry 5810, Audiovox Thera Pocket PC, Handspring Treo, Motorola iDEN i95c, Siemens S46, LG 3000W, and Kyocera QCP6035.

Seven: The Enduser

The enduser, the person who uses the content, is the last link in the value chain. The enduser is concerned with service transparency (or from an operator perspective, seamlessness), accessibility to content, affordability, billing information, privacy, and security. Diffusion and adoption of new services throughout society has traditionally followed an endogenous S-curve model where word of mouth (and force of example) spreads knowledge from a group of innovators to early adopters then on to early maturity and late maturity groups before finally reaching the laggards. But there are additional exogenous factors to take into consideration. Lots of things – such as compelling content, interoperable mobile networks, and fixed-wireless interconnectivity to name a few – must be in place for a new service to be adopted widely. There is also a need for understanding the deeper social context of people and places when new services and applications are introduced – see Box 7. Each place has its own social system and consumer characteristics for adopting and using new technologies. [A beleaguered American father called his cellphone “the essential tool of the divorce family.” – (Wall Street Journal, 2001)] No matter how promising the technology is, failure to heed differences in social outlooks and behavior is likely to seal any venture’s doom.

Box 7: Future Chinese Consumer Characteristics

The Center for the Future of China (CFC) of Beijing University has done recent work on the diffusion of lifestyle innovations in China and classified the characteristics of China’s new consumer groups.

Relevant “guideposts” are listed below.

- Young Chinese identities and lifestyles are shaped by powerful external drivers: groups of teens will be significantly different from each other in 3-to-5 year increments
- China has a unique diffusion S-curve (much of China is poor and rural) creating an illusion of diffusion of new ideas: rapid diffusion in urban areas does not imply rapid diffusion nationally
- Chinese not very “other-oriented”: most new ideas not permanently adopted
- China will remain a utilitarian consumer society: consumers more influenced by value, price, and function more than by brand, fashion, or image
- Workplace is undergoing rapid transformation and will become major source of new concepts and innovations in identity, social relationships, and technology. Innovation will diffuse from workplace to household – [“China’s New Consumer is China’s New Worker”]
- Technology as key to new identity and success: younger Chinese generations are “nerdy”
- China will become unique information society: more value placed on adoption of new concepts and ideas and on distinct new lifestyles than on new products

Some of the business implications to be drawn are

- Some “hot” consumer subgroups but majority wary of spending their money (fraud, cheating, poor quality control, bad service)
- Market segmentation will change frequently, as China’s mass society moves to class society, as rural becomes urban
- Chinese consumers fundamentally different from Asian consumers: main influences to come from within China than from outside
- External innovations get changed as they get assimilated into Chinese life

“China’s Generations: The Transformation of Daily Life,” CFC, 2002, www.china-future.org

Conclusion

Each link of the value chain identified above needs to be brought into an ecosystem.

This includes the different parts of the industry, the investment finance sector, Government and public sector bodies, universities, research institutes, and training bodies. Because of the special role SMEs will play in this process, the forum has made an extra effort to invite SMEs to participate and offered free facilities to display their products. We are thankful to our sponsors for the funds that make this possible.

This forum will be followed up in early 2003 by a Government-led seminar. The input to the seminar will include the output of this forum. For that reason we have suggested an Action Plan for discussion that runs throughout the agenda of this forum.

The Wireless Content Value Chain: A Multifaceted, Multisplendored Organism

Value Chain	Domain Knowledge Nodes	Typologies	Companies: Traditional and Non-traditional
(1) Creation	Ideas	Start-up: “small companies with young people that will do the innovation and build up the industry”	Watch This Space (Hong Kong)
(2) Development	SMS, WAP, open XHTML, J2ME, Personal Java (P-Java), Brew, XML, Microsoft Windows	Consumer and Enterprise (Intranets) applications; Mobile email; Instant messaging; Location-based services; Voice-enabled services; Entertainment; Gaming; Web-hosting; MP3	Jamdat; Pollen Mobile; Tiger Woods PGA Tour Golf; Botfighters (It’s Alive); Computer Associates; Verisign; Mobile Games Interoperability Forum (MGIF); Vindigo Restaurant Finder; Rocket Mobile’s go2 Directory
(3) Commercialization	IPR, NDA, contract law, Fundraising	SME funds from angel investors; GEM	Legend Mobile (USA) & Playboy Magazine
(4) Market Makers	Middleware messaging; Security & SSL (encryption, authentication, and authorization); Microsoft .NET; Marketing savvy	Wired-to-wireless portals; Wireless network operator portals; Independent wireless operators; Application platforms; Content management; Corporate data access; Systems integration; Consultants; Mass media; Retailers; Utilities; Government Agencies; vertical ASPs	Club Nokia; Yahoo; Reuters: Sonera’s Zed; DoCoMo’s I-mode; SK Telecom’s “Nate”; China Mobile’s Monternet and M-Zone; AOL Mobile; CNN Mobile; China Motion; Sims Online; EverQuest; Messaging: Logica, CMG; IBM; Oracle; Siebel; HK Police; MSN; Starbucks; Walt Disney; Tom.com; Sina; Vizzavi (cautionary tale)
(5) Delivery	GPRS/Edge; 1xRTT (1xEVDV, 1xVDO); Soft switch; New air interfaces (WCDMA, CDMA2000, TDSCDMA); VoIP; WLAN (WiFi, 802.11b); Free Space Optics; Multimedia gateways, servers, and transcoders; Packet Data Serving Node (PDSN); Triple A security protocol	IP networking; New information economics; Alternative revenue models	CSL; SmarTone; Sunday; NTT DoCoMo; Vodafone; Virgin; Juniper; Cisco
(6) Access Devices	Ipv6; Bluetooth; Graphics engine; Smart SIM cards; Brew-enabled or J2ME-enabled?	“Multimedia” phones; “All-in-one” phones; Open Mobile Architecture; Becoming like PC industry?	Nokia; Motorola; Ericsson; Intel template; Samsung; Siemens; Matsushita; Handspring; Research in Motion (RIM); TCL; Bird; Zhongxing
(7) Endusers	No one “gives a damn about technology” except for CTOs and CIOs	Individual consumers; SMEs; Large corporations	Dazed and confused