Market Analysis Report: China’s Telecommunications Industry

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EXECUTIVE SUMMARY

- China’s telecommunications industry is subject to a range of regulatory restrictions and opportunities for foreign involvement which vary by segment:
  - The communications equipment segment provides the most opportunities for Israeli firms. The market for mobile communications equipment in particular has grown rapidly in recent years. Israeli companies should leverage their technological superiority to access the market.
  - The value-added services segment, while subject to a higher degree of regulatory restrictions, still presents opportunity for foreign firms.
  - Basic telecom services including mobile and fixed-line services are virtually inaccessible to both foreign and domestic firms.

- Primary drivers behind the success of China’s communications industry include the growing number of internet and mobile service subscribers and international demand for lower cost communications equipment manufactured in China.

- Converged communications which merge TV, mobile and internet services is a stated goal in the telecom industry, although progress has been slow to date.

- The communication application software segment is saturated with small-scale companies recording low levels of profit. Foreign companies have historically been less competitive in this segment.

- The instant messaging segment grew 30% in 2009, and is dominated by a few large players. Foreign enterprises looking to access this market will be required to establish a joint venture (JV).

- The Voice over Internet Protocol (VoIP) segment is underdeveloped in China due to an overly-restrictive regulatory environment.

- IPTV is still in a preliminary stage of development; the challenge is developing a successful, profitable and localized solution for IPTV commercial use in China.

- Online content, including music, gaming, advertising, and audio/video programming continues to be promising; foreign enterprises that can establish JVs have considerable potential for success in this segment.

- Opportunities exist for Israeli firms in China’s 3G transition. Israeli firms can support the transition by providing relevant equipment, especially wireless network equipment, network optimization, test and maintenance, switching equipment, optical fibers and cables, optical transmitting equipment, business application platforms, network management systems and equipment with 2G-3G converged features.

- Medium-term opportunities exist for Israeli firms that are able to provide equipment in support of future 4G development.
The graph below summarizes the opportunities for Israeli firms in China by segment. Based on a combined assessment of China’s regulatory environment and commercial opportunities, we believe that companies operating in the communications equipment segment (the top right corner) will have the most opportunities, while companies operating in the VoIP (the bottom left corner) will experience the most challenges. We omitted the mentioning of basic telecom services, as we believe that segment is virtually inaccessible at this point in time.
1. REGULATORY OVERVIEW

- Despite China’s accession to the WTO and subsequent concessions to lower barriers to trade, the telecom industry remains highly regulated.

- The telecom equipment market is the most accessible to foreign enterprises, especially those in possession of advanced technologies. Terminal equipment related to public telecom networks must apply for testing certificates and registration before deploying in China.

- The telecom value added services (VAS) market, while technically open to foreign investment, requires the establishment of a JV. The market is not inaccessible, but those looking to penetrate must be willing to expend considerable effort navigating the approval process. Content-related VAS need to be particularly aware of the sensitivities in this area, and the commercial difficulties of monetizing content in China.

- The telecom basic services market including fixed-line and mobile service operation is generally considered inaccessible to foreign enterprises at this time.

1.1 TELECOM EQUIPMENT

China does not currently have any concrete restrictions in place against importing communications related equipment. As Chinese incomes continue to rise, giving way to a growing culture of consumerism, and the nation makes preparations for transition to 3G telecom standards, the market for telecom equipment, and especially mobile communications equipment, is expected to continue its current trend of rapid growth (see market overview section).

Telecom equipment for public telecom networks must receive domestic testing certification and registration before being launched in China. This testing and registration process can be handled either through domestic import agencies or sales agencies located in the foreign enterprise’s home country. Normally for big projects such as 3G related purchasing, procurement will go through a public bidding process, with relevant information published on government procurement websites.

With respect to foreign investment, the Catalogue for Guidance of Foreign Investment (Amended in 2007) guides foreign investment in China and categorizes business sectors into three groups (encouraged, restricted, and prohibited). These guidelines either ‘restrict’ or ‘encourage’ foreign investment for the majority of telecom equipment. The items not mentioned in the Catalogue are regarded as “permitted” for foreign involvement into Chinese market.

Manufacturing telecommunication equipment for satellites, local area networks, ultra wideband (UWB) communication equipment, IP digital communication systems, high-end routers, network switchers, 3G and later generation mobile phones (development and manufacturing), base stations, core network equipment and network testing equipment are all activities listed as encouraged in the latest Catalogue. The majority of other communications equipment is not listed in the Catalogue, which means it automatically falls into the ‘permitted’ category.
In the absence of explicit barriers to trade or market entry in the telecom equipment segment, there are substantial opportunities for foreign firms looking to supply key equipment and technologies. However, recent moves by the Chinese government may suggest an increase in regulations to protect domestic firms. One such example was the removal in January 2009 of preferential Value Added Tax (VAT) policies for certain foreign communications equipment imports. The removal of this provision leveled the playing field for foreign telecom equipment producers, who are forced to compete with domestic rivals who often tend to be more competitively priced. As a result, Israeli equipment producers looking to access the Chinese market must increasingly rely upon technological superiority in order to gain a competitive advantage over more cost-effective domestic competitors.

1.2 TELECOM VALUE ADDED SERVICES

China’s current regulatory framework governing the telecommunications services segment evolved from the Telecommunications Regulations promulgated in 2000, followed by a series of interpretations that categorized the telecom market into ‘basic’ and ‘value-added’ segments, and divided each segment into two categories (see the table on the following page). The fundamental difference between the two categories is the perceived impact on state security and assets. As a result, Category One is typically very closed off to foreign involvement while Category Two presents a bit more opportunity for foreign enterprises.

<table>
<thead>
<tr>
<th>IPR Issues in China</th>
</tr>
</thead>
<tbody>
<tr>
<td>While the protection of intellectual property rights (IPR) remains a contentious issue for companies operating in the China market, the country’s laws and regulations have progressed considerably in recent years, with the large majority now being compliant with the requirements of the WTO’s TRIPS agreement.</td>
</tr>
<tr>
<td>The main challenge surrounding IPR protection in China is the lack of effective enforcement of existing regulations. Enforcement issues arise from a range of root causes, including the relatively recent introduction of IPR legislation and concept of intellectual property in general, the absence of a fully independent judicial system, and provincial officials’ often protective attitude towards local, job creating counterfeiting industries.</td>
</tr>
<tr>
<td>While most foreign companies considering business operations in China may have to accept an unavoidable degree of IPR infringement, there are nevertheless a number of actions that a company can take in order to limit their IPR-related risk:</td>
</tr>
<tr>
<td>- Ensure to register your patents, copyrights, or trademarks with the relevant bureaus</td>
</tr>
<tr>
<td>- Ensure that your trade or other business agreements include clauses to protect your IPR</td>
</tr>
<tr>
<td>- Sign contracts or confidentiality agreements with staff that has access to key technologies and make sure that your policies on trade secrets and other relevant issues are properly communicated</td>
</tr>
<tr>
<td>- Be aware of China’s (often quickly changing) laws and regulations, and understand the different possible ways of redress, including administrative and judicial channels.</td>
</tr>
</tbody>
</table>
### 2003 Telecom Catalogue – An Overview of Services

<table>
<thead>
<tr>
<th>Basic Services</th>
<th>Category One</th>
<th>Category Two</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basic Services</strong></td>
<td>Fixed-line communication services (international fixed-line long distance telephone services, fixed-line network local telephone services, and fixed-line network long-distance telephone services)</td>
<td>Paging, trunked radio, VSAT</td>
</tr>
<tr>
<td></td>
<td>Cellular mobile communications services</td>
<td>Data communications services (covering packet-switched data transmission services)</td>
</tr>
<tr>
<td></td>
<td>Satellite services</td>
<td>Domestic communications facilities based services</td>
</tr>
<tr>
<td></td>
<td>Data communications (internet data transmission services, international data communications services, internet data transmission services)</td>
<td>Wireless local access</td>
</tr>
<tr>
<td><strong>Value Added Services</strong></td>
<td>Online data processing and transaction processing services</td>
<td>Store and forward services (covering voice mailboxes, X,400 email services, fax store and forward)</td>
</tr>
<tr>
<td></td>
<td>Domestic multi-party communications services such as teleconferencing and videoconferencing</td>
<td>Call centre services</td>
</tr>
<tr>
<td></td>
<td>Domestic internet virtual private networks (VPNs)</td>
<td>Internet access services (also known as internet service providers)</td>
</tr>
<tr>
<td></td>
<td>Internet data centers (IDCs)</td>
<td>Information service business (also known as internet content providers)</td>
</tr>
</tbody>
</table>

**Equity cap for foreign investment**

- **49%** for Category One
- **50%** for Category Two

VAS falling under Category Two represent the most accessible segment of the telecommunications services segment in China for foreign enterprises. Investment into the telecom VAS segment requires the establishment of a JV, with the foreign company’s stake limited to 50%. Additionally, in order to obtain approval the JV must meet specific registered capital requirements.

However in practice the Chinese government has continued to adopt stalling tactics to avoid introducing foreign invested JVs. Currently among approximately 22,000 licensed VAS companies in China, only approximately twenty involve foreign investment, with only relatively large and influential players succeeding in establishing VAS JVs. (such as Microsoft, Google, and ESPN). The remaining ten or so companies who have succeeded in this regard either have close government ties (such as SK China Unicom Information Technology Co., a JV effort between China Unicom (51%) and SK Telecom (49%)) or fall under the CEPA (Closer Economic Partnership Arrangement with Hong Kong and Macau) umbrella.

Additionally, VAS providers are subject to a wider range of regulatory issues, especially those involved in providing content. A company seeking to provide ICP (internet content providers) classified services in China must apply for an ICP telecom VAS license, and the company must be in compliance with foreign investment restrictions (i.e. for VAS no more than 50% foreign ownership). The ICP license is an umbrella category that covers all content related services either through wireless/mobile or internet access, including SMS, MMS, CRBT, WAP, IVR, music, gaming, advertising, audio/video program and
others. In addition, there are some services that require pre-approval from multiple regulators, including content related to news, publishing, education, medicine & health and medical devices.

These multiple obstacles foreign enterprises must navigate in order to legally participate in the telecom VAS segment in China have served to discourage widespread market entry from abroad. While the risk and effort that are associated with pursuing a VAS JV option are significant, the rewards that accompany success may be equally substantial, given the impressive potential that the telecom VAS market currently indicates.

Israeli firms that want to take advantage of the telecom VAS market but would prefer to not get involved in the risky JV application process can opt for a “backdoor” approach, i.e. creating an agreement with local firms that already have VAS licenses. Typically this type of agreement involves foreign firms providing technological support in return for a shared portion of the domestic firms’ revenues, in the form of a service or leasing fee. However, this business model has inherent risks as well, as from a regulatory standpoint it exists in a grey area.

1.3 **TELECOM BASIC SERVICES**
While technically China allows for foreign enterprises to invest in up to 49% in a JV providing basic services in the telecom industry in order to make good on its WTO accession commitments, the reality is that the market is currently dominated by an oligopoly comprised of three state-owned enterprises, with further entry barred by the Chinese government.

One good example is Vodafone, a UK-based MVNO (mobile virtual network operator) who invested in China’s biggest mobile operator China Mobile in 2000. After a decade long attempt to enter the basic service market, Vodafone finally sold off its 3.2% stake in China Mobile in September 2010 as an effort to roll back its fruitless expansion in the Chinese market.
2. MARKET OVERVIEW

- China’s 3G transition is expected to be a crucial driver behind industry growth for the near future.
- Converged communications merging TV, mobile and internet services is a stated goal in the telecom industry, although progress has been slow to date.
- The communications equipment market will continue its rapid growth. This segment provides the most opportunity for foreign firms with superior technology and equipment. Wireless handset parts and handsets make up the biggest portion of China’s communications equipment imports, followed by Ethernet exchangers, switching apparatus parts and wireless network interface cards.
- The mobile value-added services segment is expected to maintain rapid growth. Foreign firms looking to access this market will face a more challenging regulatory environment.
- The communication application software segment is saturated with small-scale companies recording low levels of profit. Foreign companies have historically been less competitive in this segment.
- The instant messaging segment grew 30% in 2009, and is dominated by a few large players. Foreign enterprises looking to access this market will be required to establish a JV.
- The Voice over Internet Protocol (VoIP) segment is underdeveloped in China due to an overly-restrictive regulatory environment.
- IPTV continues to develop; the current challenge in the segment is developing a successful, profitable and localized solution for IPT commercial use in China.
- Online content, including music, gaming, advertising, and audio/video programming continue to be promising areas; foreign enterprises that can successfully establish JVs have considerable potential for success in this segment.

2.1 INTRODUCTION

Sustained by phenomenal economic growth, the communications industry in China has thrived over the past decade. As illustrated by the accompanying chart, China has made significant progress in increasing the number of mobile subscriptions as well as internet users in the past few years.

To understand China’s communication industry, it is important to first look at the oligopolistic nature of the country’s telecom operation market.
While previously, China had a number of major state-owned telecom carriers competing in the market, in May 2008 China’s telecom regulator, the Ministry of Industry and Information Technology (MIIT), initiated an industry restructuring process which, through a series of mergers, reduced the country’s major state-owned telecom carriers to three, namely China Mobile, China Telecom and China Unicom.

The move was aimed to enable each of the three operators to offer full telecom services and compete with equal service base in the market, which had previously been dominated by four broad players, two in fixed-line and two in mobile. The other objective of the restructuring was to set the stage for 3G telecom operations. After the industry shake-up in early 2009, the three operators were awarded 3G licenses and subsequently launched their respective 3G services to the market. 3G technology is expected to provide the largest impetus for the next wave of telecom growth and will present enormous business opportunities for all market participants.

The most important segment of China’s broad communication industry is the equipment segment, which had total sales revenue of USD 129 billion by 2009. Mobile VAS, which currently has a USD 27 billion market, has also shown potential to expand significantly in the next decade, especially in light of the roll-out of 3G operations in China. Communication application software, instant messaging and IPTV sub-markets, although much smaller compared to the equipment and mobile VAS segments, are all expected to grow.

The geographic clustering of information and communication technology investment and markets follows China’s general pattern of development. Eastern and coastal provinces and cities (especially Beijing and Shenzhen) have the strongest capacity and largest user bases in the communication sector, while western regions where economies are less developed are less competitive in the sector (for a map of China, please see Appendix II).

### 2.2 THE COMMUNICATIONS MARKET

From 2004 to 2009, the total number of China’s telecom users increased at an average annual growth rate of 10.4%. At the end of 2009, over 1 billion out of China’s 1.3 billion citizens subscribed to telecom services. This 1 billion telecom subscriber population is comprised of roughly two thirds mobile telecom users and one third fixed-line users. While the number of mobile users continues to consistently increase, the fixed-line market has been losing subscribers since 2007. This trend
will continue as more and more users in the saturated fixed-line market shift to mobile services.

The internet population in China tripled in the past five years and has today reached nearly 400 million reaching 28.9% of the country. China now has the largest population of internet-users in the world.

The continuous expansion of China’s telecom user base has been the central driver for the growth of communication equipment and services industries. For more than a decade, turnover in the communication industry and telecom operators’ revenues have maintained strong growth rates (over 25% and 10%, respectively). In 2009, the communications industry turnover grew 14% to USD 384 billion, accounting for 7.7% of China’s GDP. In 2009, the country’s basic telecom service providers reported accumulated revenues of USD 126 billion, over 60% of which was generated from mobile communication services, 16% from fixed-lined services and 11% from data services.

Growth rates in communications operations have seen a relative slowdown since 2005, reflecting a global adjustment in the telecom industry. In 2009, the growth in both industry turnover and operating revenues in China saw further slowdowns. This was largely due to the global economic crisis and China’s telecom industry restructuring starting in May 2008.

3rd Generation Telecom Operation
After decades of flourishing, China’s telecom market has come to a point where the 2G telecom technology-based operation can no longer sustain further market expansion. As the market evolves, consumers have raised their expectations of telecom services, and are calling for new communication technologies that offer a wider range of more advanced services. In a bid to spur a new round of telecom growth, China officially licensed the country’s three major telecom service providers, (China Mobile, China Telecom, and China Unicom) to carry out 3G telecom operations based on China’s homegrown TD-SCDMA, the US-based CDMA2000, and the European WCDMA 3G standards, respectively.

3G has become a focal point in the past few years for almost every element of China’s telecom sector. It is expected to serve as a major boost to the industry and has presented tremendous business opportunities for players throughout the telecom value chain, including telecom carriers, equipment manufacturers, terminal producers and a wide range of VAS providers. According to investment plans announced by the three
major telecom operators, a total of USD 57.6 billion will be pumped into 3G network construction between 2009 and 2011. The providers invested USD 23.8 billion for 3G development in 2009 alone.

**Converged Communications**

Another frequently mentioned keyword in China’s communication sector has been converged communication, which is the merging of internet, television and telecom services. It is generally perceived as the primary goal of communications development, and the industry has already made progress in certain areas of network integration, such as wireless internet and IPTV. However the development of network convergence in China is still in its initial stages, with most of the businesses running on a relatively small scale. The reason for that has been the lack of effective business models and an obscure regulatory environment largely resulting from infighting among different industry authorities.

Nevertheless, the integration of telephone, video and data networks has begun to take shape in China. On June 6 2010, the draft plan of the network convergence trials was finally approved by the Chinese government with the first list of 12 trial cities announced. This was a strong indication of the central government’s determination to push network convergence as a national strategy. Some industry experts have predicted that China will need to have invested at least USD 86.3 billion between 2009 and 2011, before network convergence businesses can reach the desired scale.

**Value Added Services**

The continued investment in broadband infrastructure, booming e-commerce activity, and the development of the 3G-driven online VAS provide the impetus for the steady increase in China’s internet user base.

According to a recent survey by the China Internet Network Information Center (CNNIC), the four most popular uses for the internet are online music (83.5%), online news (80.1%), search engines (73.3%) and instant message (70.9%). Commercial applications in general grew the fastest with a yoy increase of 68% in 2009. Specifically, the number of online payment users grew by 80.9% with a focus on tourism, stocks, e-banking and e-shopping.

Mobile internet has also grown to become one of the major methods for accessing the internet in China. Its market size is estimated to reach RMB 15 billion by end of 2010, creating enormous opportunities.
2.3 SEGMENTS WITHIN THE COMMUNICATIONS SECTOR

2.3.1 Communication Equipment
Sales revenue of China’s communications equipment manufacturing industry in 2009 totaled approximately USD 129 billion, of which 49.8% was from mobile communications and terminals equipment and 31.4% from switching equipment. In 2007, yearly growth rates fell sharply to under 10% (previously 16%) due to the fluctuation in international demand.

The main players in China’s communications equipment industry include domestic leading companies such as Huawei, ZTE, Datang, Putian, FiberHome, and international giants like Cisco, Ericsson, Nokia Siemens Networks, and Alcatel-Lucent. There are also medium and small equipment makers, who specialize in and target specific market segments of equipment manufacturing.

In 2009, China imported USD 19.33 billion worth of communication equipment, up 1.3% from the previous year. Handset parts (50%) and finished handset products (9%) were the two most imported communication products. They were followed by program-controlled exchangers, Ethernet exchangers, multi-function printer (MFP) and optical communication equipment. The fact that communications equipment imports grew only 1.3% in 2009 compared to a much
higher growth in industry sales (6.5% in 2008) is a clear indicator of the increasing competitiveness of domestic communications equipment producers. The ability of domestic firms to compete is significantly assisted by the January 2009 repeal of the preferential VAT policies for foreign enterprises. As such, foreign enterprises looking to successfully enter the communications equipment market will need to rely upon technological superiority to distinguish themselves.

The table below lists China’s communications equipment imports experiencing the highest growth rates in 2009.

<table>
<thead>
<tr>
<th>Item</th>
<th>Import Value (USD mill)</th>
<th>’09 y-o-y Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile communication exchangers</td>
<td>35</td>
<td>364%</td>
</tr>
<tr>
<td>Program-controlled exchangers (including mobile comm. one)</td>
<td>796</td>
<td>113%</td>
</tr>
<tr>
<td>WDM optical transmission equipment</td>
<td>37</td>
<td>41%</td>
</tr>
<tr>
<td>IP telephone signal convertors</td>
<td>24</td>
<td>0.7%</td>
</tr>
</tbody>
</table>

Source: China Customs Statistics

Asian countries are the biggest source of China’s communication equipment imports, with Israel ranking 15th in terms of the overall value of exports to China. For exports, China was one of the world’s largest manufacturing countries in 2009, exporting communication equipments valued close to USD 84 billion to mostly the Asian and US market.

| China’s Major Communication Equipment Importing/Exporting Countries/Regions (2009) (In USD million) |
|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|
| EXPORTING TO CHINA                              | IMPORTING FROM CHINA                            |
| Rank | Country/Region | Value | as % of total | Rank | Country/Region | Value | % of total |
| 1     | Korea          | 3,904 | 20.2%         | 1     | Hong Kong      | 24,571 | 29.4%       |
| 2     | Japan          | 1,770 | 9.2%          | 2     | U.S.            | 11,353 | 13.6%       |
| 3     | U.S.           | 997   | 5.2%          | 3     | Korea           | 6,969  | 8.3%        |
| 4     | Taiwan         | 859   | 4.4%          | 4     | India           | 4,232  | 5.1%        |
| 5     | Malaysia       | 750   | 3.9%          | 5     | Japan           | 2,740  | 3.3%        |
| 6     | Thailand       | 605   | 3.1%          | 6     | Hungary         | 2,251  | 2.7%        |
| 7     | Hong Kong      | 422   | 2.2%          | 7     | Netherlands     | 1,704  | 2.0%        |
| 8     | Philippines    | 375   | 1.9%          | 8     | U.K.            | 1,590  | 1.9%        |
| 9     | Germany        | 351   | 1.8%          | 9     | Mexico          | 1,545  | 1.9%        |
| 10    | Finland        | 320   | 1.7%          | 10    | Germany         | 1,473  | 1.8%        |
| 15    | Israel         | 101   | 0.5%          |        |                  |        |            |

Source: China Customs Statistics

The Chinese communications equipment market is expected to continue to grow, with an increasing proportion of it driven by increased domestic demand. China’s transition to 3G services, growing popularity in a wide range of mobile VAS, continually growing mobile service coverage, and the recently announced “Home Appliances to the Countryside” policy (under which the Chinese government will provide a 13% subsidy to mobile phones
purchased in rural areas in China) will all continue to drive the growth of China’s mobile telecom subscriber base.

<table>
<thead>
<tr>
<th>2010-2011 China Comm. Equipment Market Forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit</strong></td>
</tr>
<tr>
<td>GSM ′000 carrier frequency</td>
</tr>
<tr>
<td>CDMA ′000 carrier frequency</td>
</tr>
<tr>
<td>3G ′000 carrier frequency</td>
</tr>
<tr>
<td>Optical Transmission billion RMB</td>
</tr>
<tr>
<td>Optical Fiber million core-km</td>
</tr>
<tr>
<td>CDMA Handsets million units</td>
</tr>
<tr>
<td>GSM Handsets million units</td>
</tr>
<tr>
<td>3G Handsets million units</td>
</tr>
<tr>
<td>Data Comm. billion RMB</td>
</tr>
<tr>
<td>Broadband million lines</td>
</tr>
<tr>
<td>Fixed-line Network million units</td>
</tr>
<tr>
<td>Terminals</td>
</tr>
</tbody>
</table>

Source: China Market Intelligence Center

The relative ease of entry to the Chinese market, from a regulatory standpoint, combined with a huge and growing market, makes the communications equipment segment an extremely attractive one for foreign enterprises looking to penetrate China. Foreign enterprises should leverage technological advantages they may have in this segment in order to most effectively enter and gain market share in this promising segment.

2.3.2 Mobile Value-Added Service

In 2009, the mobile VAS market in China reached USD 27 billion, a 23.5% increase over the previous year. Spurred by rapid 3G market development and a steadily growing mobile phone user base, the wireless VAS market is expected to achieve a sustainable 20% annual growth rate over the next three to four years. Another factor behind this projection is the fact that growth in the traditional mobile services market has started to slow down, prompting telecom operators to develop a new business model (mobile VAS) to maximize profit growth.

Short message service (SMS) accounted for over 60% of the overall mobile VAS revenue, making it the largest mobile VAS business followed by multimedia messaging service (MMS), polyphonic ringtones, and wireless application protocol (WAP). The increased information transmitting capacity in the 3G network will likely drive the growth of content-intensive mobile VAS services such as mobile games, TV and music, while generally promoting the diversity of service offerings. At present, 3G-featured applications such as mobile audio/video, mobile payment and mobile gaming have been growing fast within a large group of users.

According to a CNNIC, the four most popular uses for the internet are online music (83.5%), online news (80.1%), search engines (73.3%) and instant message (70.9%). Commercial applications in general grew the fastest with a yoy increase of 68% in 2009.
Specifically, the number of online payment users grew by 80.9% with a focus on tourism, stocks, e-banking and e-shopping.

There has been an increasing trend in recent years for major operators to run their own mobile VAS to gain access to the fast-growing market. As the market continues its expected growth, domestic non-government service providers active in the market such as Sina, NetEase, Sohu, TOM, Beijing Newpalm, and Shenzhen SkyInfo, will continue to prosper.

2.3.3 Communication Application Software
At present, the communication application software market in China is far from mature with over-competition and low profits among a multitude of small-scale companies. Some relatively larger companies include AsiaInfo, Linkage, Neusoft, Bright Oceans and SureKAM. Foreign companies such as Portal, CSG and Siebel have also entered the market, though they have mostly been less competitive because of higher pricing and insufficient localization.

The communication application software market is expected to reach USD 2.3 billion by 2011, mainly driven by the launch of increasing 3G services in China. BSS (Business Support Systems), OSS (Operation Support Systems), and MSS (Management Support Systems), and the segments of billing, network management, customer management and security in particular,

Flagship Telecom Companies

AsiaInfo
Founded in 1993, it specializes in the development of business and telecom software solutions and IT security products. In 2008 its revenues grew 32% to USD 175.5 million.
- Its software solutions and services covering IP, VOIP, broadband, wireless and 3G, include business and operation support systems, service application solutions and network infrastructure solutions.
- Also offers IT security products and services, which are focused on firewall and VPN technologies.
- Has a long record of entering new business segments through acquisition.
- Major customers include China’s major telecom carriers, as well as leading international IT companies

Tencent Inc.
Founded in 1998, China’s largest and most used Internet service portal. It generated USD 1.03 billion in revenues in 2008.
- Greatest competitive advantage comes from popularity of instant messaging platform.
- Also offers online media, interactive entertainment, E0commerce, and mobile and internet VAS.
- Formed strategic partnerships with a number of foreign companies, including IBM and Intel.
will become some of the main development and investment areas to support future 3G construction in China.

2.3.4 Internet Messaging and VoIP

The number of users of Internet Messaging, or Instant Messaging reached 270 million by the end of 2009, with a y-o-y growth rate of 22%. Among the total, one third are mobile IM users.

For personal user, Tencent and MSN are the two top giants that dominate the Chinese IM market. For company use, the top players in China are Tencent (RTX), Microsoft (OCS), IBM (Lotus Sametime), Dianji Tech (GKE), InfowareLab (Easy Touch), IMO and Jingoaol. Tencent enjoys 70% market share in the enterprise IM market. Mobile handset-wise, mobile QQ (Tencent), mobile Feixin (China Mobile) and mobile MSN are top three market share holders, occupying over 96% of the whole mobile IM market in China.

Foreign enterprises looking to access the IM market are required to establish JVs, facing the same hurdles discussed in earlier sections. Cooperation with Chinese companies through technology support could be one option for foreign companies with no direct investment plan, but remains subject to regulatory and commercial risks, given the grey area in which this approach would require the foreign enterprise to operate.

VoIP, also known in China as “broadband phone” or “multi-directional communication” systems, is classified as a Category One VAS. While less restricted than basic services, it
remains a difficult segment for foreign investment or involvement. China’s three telecom operators are licensed to provide both basic and value-added telecom services across China, including VoIP. However, given their incumbent nature, operators have been slow to pursue VoIP which undermine existing revenue and profit structures.

ISP (Internet Service Provider) and ICP (Internet Content Provider) licensed domestic firms are permitted to provide internet access and internet content services in China, respectively. However, those firms are not permitted to access or provide service related to PSTN (Public Switched Telephone Network) voice networks. Voice terminated or generated via the PSTN must be provided by an operator. PC-to-PC service provision by an ICP / ISP licensed firm is possible; however PC-to-phone would require the involvement of an operator and could not be conducted (legally) with just an ICP / ISP license. As a result, the VoIP market in China is still far from developed due to the tightly-restricted regulatory environment.

2.3.5  IPTV and Content Delivery
IPTV (Internet Protocol Television) services in China fall into two categories:

- IPTV through broadcasting networks
- IPTV through internet networks

Thanks to the network convergence trials plan which started in mid-2010, both these categories are promising but still in initial trial stages and only in first-tier cities. As such, IPTV is far from being commercialized in China. While relevant technologies are already widely available in the market, the key challenge at the moment is to provide a profitable and localized solution for IPTV commercial use in China.

IPTV has experienced rapid growth in recent years, with a y-o-y user increase of over 100% for the past three consecutive years. By the end of 2009, China had 4.6 million IPTV users, and expects to hit 14 million by end of 2011. IPTV equipment providers include ZTE, Huawei, Konka and Skyworth. IPTV solutions are led by firms including ZTE, Huawei, FiberHome and Onewave. ZTE is a full-package solution provider which accounts for over 50% of the IPTV equipment market in general.

In 2009, the internet gaming market reached USD 3.9 billion, growing 40% over the previous year. Overall market revenue is expected to hit USD 9.87 billion by 2011 with an
average growth rate of over 20%. MMORPG (Massively Multiplayer Online Role Playing Game) dominates the Chinese internet gaming market with market share over 75%, followed by entertainment games and web-games that are also booming in China. The two main revenue models adopted in China are virtual item sales model (dominating around 67%) and pay-to-play model (calculated by login time). Around 50% of the internet gamers make zero expenditure while playing, and 20% spend less than USD 1.44 a month on games. As a result, developing gaming models that increase average gamer expenditures, either through virtual item sales model or subscription tiers model will be a key driving factor for further growth.

In 2009, the online advertising market hit USD 3 billion with a y-o-y growth of 78%. It is expected to reach USD 5.32 billion by 2011, with branding advertising and search engine advertising accounting for USD 3.41 billion and USD 1.91 billion in revenues respectively. Allyes AdNetwork, Hylink Ad., Catch Stone Ad. and Tensyn Interactive Ad ranked as the top leading online advertising companies in China. Search engines, rich media and other new models of online advertising will become the main driving factors behind this market. In terms of sub-sector market share, there is a declining trend for display and rich media advertising, while search engine advertising has been experiencing growth in recent years. Search engine advertising is likely to exceed display and rich media advertising to become the top form of online advertising revenue generator by 2010. Big Chinese players as service providers include portals like Sina, Sohu, NetEase, Tencent and TOM, and specifically Lianzhong (ourgame.com) and Shanda for gaming, and Tudou, PPStream and Yule for audio/video programming.

Online content, such as music, gaming, advertising and audio/video programming, falls into the VAS category two, which is less restricted by Chinese government, but still requires an ICP license for service providers. Content services related to healthcare, education and news also require extra specific licenses before applying for an ICP license.

Sino-Israeli technology cooperation and technology support will be much easier in these sectors from a regulatory perspective. Such a business model would involve setting up a financial agreement whereby the foreign firm would provide technology support to a domestic firm that has an ICP license, and in return the domestic firm would share a portion of its operating revenue with the foreign firm in the form of a service fee or a leasing fee. However, such a business model exists in a grey area in terms of regulatory administration, presents high risks for foreign participation and only serves for short-term business purposes.

### 3. MARKET OPPORTUNITIES

<table>
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<th>Opportunities and Recommendations</th>
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<td>- The main areas of opportunity are 3G deployment and relevant services, converged communications (telecom, broadcasting and internet), and unified communications.</td>
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<td>- China’s 3G transition is expected to generate huge opportunities for those capable of</td>
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China’s Telecommunications Sector - Prepared for IEICI
Updated November 2010 (Original April 2009)
providing equipment in support of the 3G development, especially wireless network equipment, network optimization, test and maintenance, switching equipment, optical fibers and cables, optical transmitting equipment, business application platforms, network management systems and equipment with 2G-3G converged features.

- In the medium term, support of 4G capability developments will provide opportunities for Israeli firms capable of providing supportive services.
- Israeli firms that sell equipment or applications to service providers (fixed & mobile) need to recognize that there are only three such companies and they are all state-owned. This places Israeli vendors at a commercial disadvantage and application vendors in particular (often smaller companies) have sometimes been squeezed to the point of closure (China Mobile has also began developing applications in-house). Consequently, foreign companies often choose local partners to access the market.
- Israeli telecom equipment vendors should recognize that the cost structure of domestic Chinese vendors with similar equipment or technology will almost inevitably be more competitive and they will also have easier access to customers. Opportunities are still there, but the competition is tough.
- Israeli firms that already sell equipment or solutions to mainstream international vendors (Cisco, Ericsson, Nokia-Siemens, Alcatel-Lucent, etc.) may wish to look for opportunities to capitalize on those relationships in China. These companies have invested a great deal of time and resources into cultivating customer relationships with their operators.
- For Israeli firms hoping to license technology to a domestic Chinese telecom equipment manufacturer, the main stumbling blocks tend to be the valuation of the technology, the protracted negotiation process and the IPR risks involved.

### 3.1 CURRENT OPPORTUNITIES

**3G-driving Equipment Purchase**

Telecom operators will invest approximately USD 24.5 billion into 3G network development in 2010 (and USD 57.6 billion in total by 2011, to serve 150 million users) which will continue to drive the telecom equipment industry. In terms of investment structure, a quarter of the total USD 24.5 billion, or USD 6.12 billion, will go towards wireless network access equipment. Switching equipment, optical fibers, cables and optical transmitting equipment are expected to each receive 5% of the total investment, totaling USD 1.22 billion. Network optimization, test and maintenance will receive 12% of the investment, 2% for network management system and 6% for business application platforms.

Assisted by the 3G expansion, manufacturers of wireless network access equipment and optical equipment are expected to enjoy rapid growth in the coming years. Equipment with 2G-3G converging features will also become increasingly popular among telecom operators.

Taking the lead in developing China’s home-grown 3G TD-SCDMA network technology, China Mobile will continue its planned RMB 120 billion 3G investment from 2009 to
2011. By the end of 2009, China Mobile had completed its third-phase TD-SCDMA network construction, with its nationwide TD-SCDMA network covering over 70% of the country's cities. China Mobile plans to add 140,000 TD base stations from 2009 to 2011 and will extend its 3G network coverage to all Chinese cities by the end of 2010.

Foreign firms with the capability to contribute to the 3G transition by providing up-to-date equipment have an excellent opportunity to access the Chinese market, especially given the relatively relaxed regulations regarding foreign sales of equipment into China.

4G Evolution
Though China is still in the middle of the transition to 3G services, it is already under considerable time pressure to make the eventual upgrade to the 4G systems. Most developed nations already began implementing 3G systems 8 years ago, and it is believed the 4G evolution will take place between 2010 and 2012. China has a long way to catch up given its late entry into the 3G market.

As China's only 4G standard, TD-LTE has been successfully applied at the Shanghai World Expo and is becoming popular around the world. The development of 4G in China has created great opportunities for equipment vendors and companies such as Datang, Motorola, Ericsson, and Alcatel-Lucent. It is expected that China Mobile and Datang will take the lead in TD-LTE deployment. China Mobile recently confirmed that 60% of future investment in China will be spent on TD-LTE.

The Stimulus Plan's Effect on the Electronic and Information Industry
When the Chinese government announced its general stimulus plan, specific stimulus spending was directed towards supporting the electronics and information industry which reflects its priority as a long-term development area. Investments are focused on spurring the progress of 3G mobile communication services, promoting the use of digital TVs, developing national science and technology projects, and encouraging Chinese electronics and information enterprises to expand overseas. The plan included RMB 600 billion for 3G, NGN and digital TV. However, it is believed 3G will receive most of the investment with RMB 550 billion directed towards it in the next three years.

New-generation information technology has been highlighted along with six other industries by the "Speeding up Cultivating and Developing Strategic and New-emerging Industries" circular issued by the State Council in early September 2010. There will be specific funds, financial incentives as well as supporting policies for carrying out these plans. It is expected that new-generation information technology development will include network infrastructure, new-emerging communication services innovation and industry informatization. 3G, wireless broadband and optical networks are expected to boom even faster from the effects of the government stimulus plan.
3.2 Key Industry Events

P&T/Wireless & Networks Comm China 2011
(2011 年中国国际信息通信展览会)
China International Exhibition Centre, Beijing
September 26-30, 2011
With strong government and local industry support, this event has been held 19 times with both local and global participants. It currently ranks as the largest global-level ICT Expo in Asia. MIIT (the key stakeholder regulating the telecom sector in China) is the main organizer, with China’s three basic service operators, China Mobile, China Telecom and China Unicom, serving as co-organizers of the event. Participants come from all parts of the industry chain, including carriers, equipment and terminal manufacturers, channels, service providers, software vendors as well as academic institutes and industry associations.

Website: http://www.ptexpo.com.cn

2011 NextComm Expo & CENC (Spring Session)
(下一代网络通信展暨中国企业网络通信大会)
Beijing
April 19-21, 2011
CENC (China Enterprise Network Communications) is China’s most high-profile and influential next generation network & telecom event, taking the form of both a conference and exhibition. It is held twice a year, once in Beijing and once in Shanghai. The event attracts thousands of professionals from all parts of China’s IP communications supply chain including carriers, end users (especially key accounts from various vertical markets and large enterprises), channels, manufacturers, software vendors, VASP (value added service provider), along with numerous channel distributors and SIs. This year’s areas of focus include:

- IP Communications and UC (Unified Communications) in China for both carriers and enterprise markets, the status quo, deployment rate and speed and the future perspective
- IPT, IP Call center market in China
- Wireless IP communications; Mobile internet
- NGN/IMS/FMC
- China market for video communications (conference, monitoring)
- The market perception and reception of IP-based VAS

Website: http://cecc.nexcomexpo.com/
APPENDIX I: INVESTMENT ROADMAP

The following shows the general process by which a foreign firm would apply to establish a VAS JV in the China’s communication industry. General approval for a VAS JV has four stages:

- Approval to establish a VAS JV from MIIT
- Approval to establish a foreign invested telecom VAS JV by Ministry of Commerce
- Sectorial service approval from the MIIT
- Business license approval from the State Administration of Industry and Commerce (SAIC)

Flow chart of VAS JV Application Procedure

N.B. The pre-approval process at the local level will require approaching different government organizations in different provinces, due to different degrees of progress in a current push to restructure provincial governments.
# APCO CONTACT DETAILS

For further information please contact:

<table>
<thead>
<tr>
<th>BEIJING</th>
<th>SHANGHAI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greg Gilligan, Beijing Managing Director</td>
<td>Murray King, Greater China Managing Director</td>
</tr>
<tr>
<td>16/F, NCI Tower</td>
<td></td>
</tr>
<tr>
<td>12 A Jianguomenwai Avenue</td>
<td>2102 CITIC Square</td>
</tr>
<tr>
<td>Chaoyang District</td>
<td>1168 Nanjing Road West</td>
</tr>
<tr>
<td>Beijing, China 100022</td>
<td>Shanghai, China 2000041</td>
</tr>
<tr>
<td>Phone: +86.10.6505.5127</td>
<td>Phone: +86.21.5298.4668</td>
</tr>
<tr>
<td>Fax: +86.10.6505.5257</td>
<td>Fax: +86.21.5298.4669</td>
</tr>
<tr>
<td><a href="mailto:ggilligan@apcoworldwide.com">ggilligan@apcoworldwide.com</a></td>
<td><a href="mailto:mking@apcoworldwide.com">mking@apcoworldwide.com</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HONG KONG</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Larry Snoddon, Chief Executive Officer, APCO Asia</td>
<td></td>
</tr>
<tr>
<td>19/F, Cambridge House, Taikoo Place</td>
<td></td>
</tr>
<tr>
<td>979 King's Road</td>
<td>979 King's Road</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>Hong Kong</td>
</tr>
<tr>
<td>Phone: +852.2866.2313</td>
<td>Phone: +852.2866.1917</td>
</tr>
<tr>
<td>Fax: +852.2866.1917</td>
<td></td>
</tr>
<tr>
<td><a href="mailto:lsnoddon@apcoworldwide.com">lsnoddon@apcoworldwide.com</a></td>
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