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Sector Report

The ICT Market in China
China’s ICT sector has grown rapidly because of the support of the Chinese government’s plans and policies. By the end of 2014, there were 630 million internet users and 1.29 billion mobile phone users in China. These numbers demonstrate the growth of the market for the ICT sector. Even though a catch-up process for technical innovation capacity is taking place, the overall high-tech innovation capacity of the Chinese ICT industry is still weak.

The ICT industry covers a wide range of products and services, including telecommunications, hardware, software, and IT services. European SMEs may find opportunities and niche markets in some of these sectors in China. However, because of complicated regulations and market barriers, EU SMEs may also encounter various challenges when entering the Chinese ICT market.

This report, updated in July 2015, highlights a growing number of opportunities for SMEs in China’s ICT sector, particularly in the area of mobile gaming, 5G, the Internet of Things (IoT), and IT outsourcing. Despite these new areas of opportunity, challenges remain, including issues surrounding intellectual property (IP), licensing, and regulation, as well as administrative restrictions.

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1. Definition

1.1. The ICT Sector

‘Information and communication technology’ (ICT) is a term that has been used by academic researchers since the 1980s. According to the United Nations International Telecommunication Union (ITU), ICT refers to equipment and services related to broadcasting, computing, and telecommunications, all of which capture and display information electronically.\(^1\)

In recent years, the ICT industry has developed intensely worldwide because of a series of new technologies, applications, and equipment that have been invented and marketed rapidly. This development has strengthened ICT’s role as an enabler for other industries and challenged simplified definitions. Telecoms’ over-the-top (OTT) services, FinTech, gaming, mobile platforms, and social mobile internet cloud (SMIC), wearables, big data, smart cities, e-health, and internet of Things (IoT) concepts now define the industry structure.

All of these new paradigms are fundamentally structured around four key technology areas, telecoms, hardware, software, and services, so we have arranged this broad industry overview along those lines.

1.2. Some Key Sub-Sector Definitions

Over-the-top (OTT) refers to the provision of various application services through the internet to end users without the involvement of telecom operators. Typical OTT services may include instant messaging, voice, internet TV, and other media.\(^2\)

Wearable devices refers to portable equipment that can be worn on the body directly or integrated into users’ clothes and/or accessories. They are hardware devices that are also capable of achieving greater functionality through software support and data and cloud exchanges. Usually, wearable devices are capable of connecting and connected to a smartphone; major product types of wearable devices include watches, shoes, and glasses.\(^3\)

Big data includes technology to handle datasets that are too large or unstructured for traditional data processing applications and so require new hardware, software, and analytics to process properly. These new approaches have strategic importance across most industries and can lead to revolutions in industrial methods or provide new market or social insights.\(^4\)

Cloud computing can be explained in several different ways but essentially allows application software and storage to be provided over the internet through public, private, or hybrid networks. The most widely accepted definition was developed by the US National Institute of Standards and Technology (NIST). According to NIST, cloud computing is a pay-per-use model that supplies available, convenient, on-demand network access into the shared pool of computing resources that can be configured (resources including networks, servers, storage, applications, and services). These

\(^{2}\) http://baike.baidu.com/link?url=75kzMsx69ECXww4vJFmmRTPVvsGEMIz6sgJREjrcGKEHw倔M_dft-r9Aaby6bMdyr5Em6U3lwPlzjqu5vEkaha.
\(^{3}\) http://baike.baidu.com/link?url=7ysZ8hCR21jksUx5r5wkPw9BI7zpl04ICtLXYHtZ9TRmlRZZzpPYL85ozKzvEy_zKv2jLeixC0EZINUBrMq.
\(^{4}\) http://baike.baidu.com/link?url=F0FjqgCz9DujiTMKqoZK0mChmoGQLEudESvyy7i3sAepHkDYolYN25KNUXBn9I4U n0fmaHO6WTdij81_ZBGjDFbXqg94cB5xHqD-rWK.
resources can be provided quickly and simply with less management effort and very little interaction with the service provider.\(^5\)

**Internet of Things (IoT)** refers to the connection of devices embedded with various information sensing equipment to the internet. The aim is to link ‘things’, which may include radio frequency identification (RFID) tags, refrigerators, wearable devices, and city streetlights, for example, to the network to facilitate the identification and maintenance/management and application of those devices. Increased connectivity is expected to accelerate automation in many industries and enable new types of interactions between devices, people, and communities, as well as providing ‘big’ data for new industrial methods and markets regarding the social insights mentioned above.

### 2. Policy Indications and Regulatory Structure

The main body regulating the ICT industry in China is the Ministry of Industry and Information Technology (MIIT),\(^6\) which replaced the Ministry of the Information Industry in 2008. It regulates the wireless signal, internet, broadcasting, communication, software, and electronic goods markets. In local regions, its support body is the Economic and Information Technology Commission (EITC).\(^7\) New nationwide policies for the ICT sector are published on MIIT’s [policy page].\(^8\) EITC level will support and implement with specific and localised terms at the provincial and municipal level.

The ICT sector is strongly promoted in China and has received support from the central government, which also encourages foreign companies to invest in the country. To attract foreign companies, some regions have issued beneficial policies for companies that offer high technology. Beneficial policies often come in the form of preferential tax policies, especially in clusters (more information on ICT clusters can be found in Section 5.2).

China’s telecommunications industry is dominated by state-owned enterprises (SOEs); therefore, there are higher entry barriers for this sub-sector than for others in the ICT sector. Foreign investment is allowed in the telecommunications sector; however, it occurs only through joint ventures (JVs), and any JV must be approved and overseen by MIIT. Table 1 shows the basic requirements for a JV in the telecommunications sector in China.

<table>
<thead>
<tr>
<th>Region</th>
<th>Business Type</th>
<th>Required Registered Capital</th>
<th>Foreign Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nationwide/Cross-provincial</td>
<td>Basic Telecommunications Business</td>
<td>&gt; EUR 150 million</td>
<td>&lt;49%</td>
</tr>
<tr>
<td></td>
<td>Value-added Telecommunications Business</td>
<td>&gt; EUR 1.5 million</td>
<td>&lt;50%</td>
</tr>
<tr>
<td>Within one Province</td>
<td>Basic Telecommunications Business</td>
<td>&gt; EUR 15 million</td>
<td>&lt;49%</td>
</tr>
<tr>
<td></td>
<td>Value-added Telecommunications Business</td>
<td>&gt; EUR 150,000</td>
<td>&lt;50%</td>
</tr>
</tbody>
</table>

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\(^5\) [http://baike.baidu.com/link?url=fhTCHXuU6SUmEO7wUJUFymVW9wM9qW1SQKR6QN0xjmUTIm0ECxUZK5P9vnB_MfCj14VPh3dZeyaRRk4vNQ].

\(^6\) [http://www.miit.gov.cn/n11293472/index.html].

\(^7\) [http://www.bjeit.gov.cn/].

\(^8\) [http://www.miit.gov.cn/n11293472/n11293832/n11294042/n12876231/index.html].

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In 2014, the MIIT and Shanghai’s municipal government jointly released a policy that opens opportunities in telecommunications for foreign companies in China in the (Shanghai) Pilot Free Trade Zone. In the government’s explanation of this new policy, it stated that foreign companies’ shareholding of information service business (app stores and data storing and forwarding) is no longer limited. The shareholding of online data processing and e-commerce was increased up to 55%. Furthermore, businesses in call centres, multi-party communication, internet access services, and virtual private networks (VPNs) were opened to foreign companies without shareholding restrictions.

Other ICT sector regulations depend on the industry itself; for instance, in the software and hardware sectors, regulations are based on content and usage. For example, on 1 May 2015, the Local Administration for Industry & Commerce (AIC) and the Municipal Commission of Transport launched an investigation of Uber’s Guangzhou office (and later its Chengdu office), as the Guangzhou province considers car-hire services that use private drivers illegal and are therefore investigating Uber for allegedly operating a taxi service without the appropriate license.

In early 2015, Dididache (similar app to Uber) was asked by the Beijing Municipal Commission of Transport to change its current business practise of using private cars and drivers to transport its clients.

2.1. MIIT’s Plans from 2014-2030

In June 2014, MIIT issued its national-level document to promote the integrated circuit (IC) industry, considered the core of the ICT sector.

By the end of 2015, MIIT predicts that the sales volume of the IC sector could exceed EUR 50 billion (RMB 350 billion). MIIT further expects that 32/28 nm technology could be applied to mass production and that mobile smart terminal and internet telecom technology could be developed further to meet international standards.

By 2020, MIIT plans for China’s IC design industry’s capability for mobile smart terminals, internet telecoms, cloud computing, IoT, and big data to be developed to international standards along with the development of world-leading mass production of 16/14 nm technology. MIIT aims for China to become less reliant on imports and foreign technology.

By 2030, MIIT predicts that the value chain for the IC industry will be mature and world leading.

Given these plans, the relevant sub-sectors will be promoted, including materials (large silicon wafers, etc.), machinery (lithography, ion implanter and encapsulation), and design (relevant software, etc.)

MIIT also plans to establish the following:

- A dedicated team to develop plans, coordinate and optimise resources, conduct research, and provide suggestions on regulations.

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12 These were all limited to under 50%.
• A national industry investment fund to attract and encourage venture capital (VC)/private equity (PE) investment in the IC industry.

The manufacturing sector will be the most supported, as:

• Preferable taxing policies for encapsulation, testing, materials, and equipment companies will be implemented.

• Tax exemptions for imported key machines/parts/materials for large projects will be implemented.

• Cooperation with IC companies/institutions will be encouraged.

3. Market Size

The Chinese central government’s preliminary GDP growth rate for 2014 was 7.4%, the lowest rate in 24 years. GDP growth is predicted to be 7.0% in 2015, and China’s economy is expected to see further slowdowns in growth. This slowing of GDP growth represents what the government is calling a ‘new normal’ as China transitions from an export-led economy to what they hope will be a more sustainable high-tech and service sector-oriented economy with increased reliance on internal demand.

In line with this macroeconomic restructuring toward high-tech industries, the International Data Corporation (IDC), a provider of market intelligence, predicts that China’s ICT sector will exhibit strong growth throughout 2015 and be valued at an estimated EUR 433 billion. IDC further predicts that the value of the IT market will reach EUR 197 billion (+45% y-o-y) and that the telecom services market will be worth EUR 236 billion (+55% y-o-y) in 2015. The ICT industry’s revenue is estimated to have grown by 8% in 2014 to EUR 246 billion. In the five-year period between 2009 and 2014, revenue grew on average by 13.5% annually.

It is predicted by IDC that the construction of ‘smart cities’, deployment of the IoT, big data and cloud services, and mobility and consumer IT products will be the main drivers of the Chinese ICT market growth.

According to statistics released by CCID.net, a leading IT website, 400 million mobile phones were sold in China in 2014. The sales volume and sales value of smart phones have continually increased as a proportion of the total mobile phone market in recent years. In 2014, over 92% of all mobile phones sold in China were smart phones.

Research by EnfoDesk, a think tank, demonstrated that China’s big data market began to increase quickly in 2014 with almost 30% annual growth. EnfoDesk further estimates that, by 2016, the market size for big data, including the market for internet user data and online financial market data, will exceed EUR 15 billion. Big data are relevant to companies that operate offline, too, such as big data platform development by IT companies.

According to Forrester, a US-based research institute, the total value generated from IoT-related technologies will be 30 times larger than that of the internet. The China Forward Industry Research Institute has conducted research to analyse the potential market driven by IoT application needs; it

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16 http://www.idc.com/getdoc.jsp?containerId=prCN25364315.
19 http://www.askci.com/chanye/2015/01/20/146381q04_all.shtml.
forecasts that, by 2015, the entire market size of China’s IoT market will reach EUR 1.1 trillion, with a compound annual growth rate of 30%.  

In 2014, 4G began to replace 3G on mobile networks, and many manufacturers switched to 4G product lines. By the end of 2014, the 4G mobile phone market had produced 90 million smart phones and exceeded 20% of the existing mobile phone market in China. The consumer research group Gesellschaft für Konsumforschung (GFK) foresees that, in 2015, ‘smart homes’ and wearable devices will drive the smart phone market to further innovation. In 2014, PCs, tablets, and mobile phones became increasingly integrated, and industry insiders predict that the distinction between these devices will be further blurred in 2015.

In 2014, the TV market also showed new emerging trends. The growth of smart TVs operated via internet browsers saw increased growth, up 26%. Furthermore, 30% of smart TVs offer smart phone control and other apps that can be easily accessed and interact with smart phones and other devices. This is predicted to be a new driver for the consumer electronic market in 2015.

4. ICT Sub-sectors

As the ICT industry covers a very wide range of EU SME products and services, this report will focus on four sub-sectors:

- Telecommunications
- Hardware
- Software
- IT services

Table 2: ICT sub-sectors

<table>
<thead>
<tr>
<th>ICT Sub-sectors</th>
<th>Telecommunications</th>
<th>Hardware</th>
<th>Software</th>
<th>IT services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic service and value-added services</td>
<td>Computers</td>
<td>Software products</td>
<td>Network services</td>
<td></td>
</tr>
<tr>
<td>Telecommunications equipment</td>
<td>IT network equipment</td>
<td>System integration and support</td>
<td>System integration</td>
<td></td>
</tr>
<tr>
<td>OTT</td>
<td>Storage devices</td>
<td>Embedded software</td>
<td>IT outsourcing services</td>
<td></td>
</tr>
<tr>
<td>Mobile virtual network operators (MVNOs)</td>
<td>Consumer electronics</td>
<td>Software-related IT consulting</td>
<td>Maintenance and support services</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wearable devices</td>
<td>Design and development</td>
<td>IT consulting services</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Smart phones</td>
<td>Big data and cloud Analytics</td>
<td>Education and training services</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Data centers</td>
<td></td>
<td>E-commerce</td>
<td></td>
</tr>
</tbody>
</table>

New Paradigm

The ICT industry has been changing rapidly in recent years. New applications and areas have become more popular, and this has become the key driver and enabler of the ICT industry’s development. Developing areas include IoT, e-commerce, and big data and cloud computing. The new applications mentioned do not fit into the traditional four categories shown in Table 1; they contain elements that span across the traditional sectors, giving rise to the development of new sub-sectors to categorise them.

For instance, the key to IoT’s development is sensors and integration. Sensors can be considered hardware, whilst integration refers to IT services. E-commerce also spans across sectors that combine retail and ICT. Even from an ICT perspective, the platform development and operations can be categorised under IT services while also involving hundreds of servers and other IT equipment to support and deliver services, which are classified as pure ICT hardware. Big data also involve a large number of servers to compute; however, the most value-added part is data analysis, which involves software and IT services.

These new popular areas have given rise to new trends in the ICT sector as newly founded sub-categories are changing the traditional categorisations.

5. Key Growth Drivers

5.1. Strong Support from the Government

In 2006, the Ministry of Industry and Information Technology (‘MIIT’) published the ‘2006-2020 National Informatisation Development Strategy’. This guideline outlined the overarching goals for the Chinese ICT industry by 2020. The key points were as follows:

- To grow the economy through high technology rather than capital investment by fully utilising the ICT industry
- To develop indigenous innovative core technologies rather than imitating or introducing them from abroad
- To establish a world-leading, reliable, and safe information system
- To make government and military affairs paperless

Detailed plans were developed and updated in subsequent policy papers regarding the ICT sector, such as in the national 12th Five-Year Plan (2011 to 2015). The Five-Year Plan is widely considered the most important document for enhancing economic and social development in China. Although the 13th Five-Year Plan has not yet been published, it is foreseeable that ICT will still be an important sector in China, as the Chinese government realises that ICT is the key to other industries’ modernisation.

In 2013, to achieve the planned objectives under the MIIT’s guidelines, it published a further document called the ‘Informatisation Development Plan’ based on the progress of the Chinese ICT sector. In this plan, several encouraged sub-sectors were listed, such as informationised logistics with e-commerce, traceability of agricultural products, epidemic surveillance, smart healthcare systems, and intelligent transportation systems.

A number of policies were also initiated to support the ICT industry’s development. The major policies included the following:

23http://www.miit.gov.cn/n11293472/n111505629/n111506609/n111968195/n11968300/n11968375/12031418.html
24http://subo.miit.gov.cn/n11293472/n11294447/n11294588/n11295539/16523835.html
25http://www.miit.gov.cn/n11293472/n11293832/n11294072/n13605287/15721731.html
EU SMEs with a competitive technology advantage could be presented with more opportunities during China’s ICT industry development, as the country is interested in developing sustainable industries with more advanced technologies. For instance, Sondrel, an IC design company from the UK, has established its China head office in Shanghai and a further office in Xi’an. It has also cooperated with many well-known Chinese universities. Furthermore, it has established an institution called the Nottingham-Sondrel School of VLSI Design with Ningbo Nottingham University in Ningbo, Zhejiang Province.

5.2. ICT Clusters

Cluster development of companies from similar industry sectors has deep roots in the economic development and innovation transformation of recent decades. China’s central government has given support to cluster development, and local governments have provided incentives, such as favourable land/tax policies, enhancement of local infrastructures, establishment of industrial parks and trading locations, organisation of trade fairs, support for enterprise technology upgrades, and coordination of the link between industry and research. Almost all the important ICT companies and start-ups with leading technologies are connected with ICT clusters; thus, they can enjoy favourable policies and take advantage of the close cooperation with other companies in the same ICT cluster.

The favourable policies of different regions mainly involve taxation and financing, but on a different scale. The less developed a region is, the more benefits companies could gain. For example, in the Hangzhou Yuhang Economic and Technological Development Area, 100% of taxes can be refunded to eligible companies in the first two years after establishment, and 50% of taxes can be refunded from the third to the seventh year.

Typically, such clusters focus on only one industry sector and are open to any company as long as it is in the relevant sector and meets the basic requirements, e.g. environmental friendliness. Foreign companies can approach them directly from contact details provided on the clusters’ websites and can enjoy the same favourable policies as Chinese companies. Moreover, many of these clusters prefer to have foreign companies located inside them to promote the cluster; this may assist foreign companies when negotiating conditions.

Certain cities are developing industrial clusters particularly rapidly. For instance, there are already over 200 IT industry clusters in Shanghai, many of which are small. In Hangzhou, the capital of Zhejiang Province, close to Shanghai, there are 13 ICT-related industry parks.

26 http://www.sondrel.com/
27 http://www.nottingham.edu.cn/cn/icpd/ourservices/industry/enterprises/sondrel/index.aspx
5.3. Development of Cutting-Edge ICT Technology

The ICT sector has always been driven by new, leading technologies. E-commerce is a booming industry sector that has revolutionised Chinese traditional consumption behaviour. Alibaba is a leading Chinese company with innovative technologies focusing on improving the customer experience, such as the ‘Smile to Pay’ feature demonstrated by Jack Ma, Alibaba’s CEO, during the 2015 CEBIT in Germany. This application enables users to pay via smart phone by smiling into the phone’s front camera.

5.4. National Development and Strong Market Needs

Although urbanisation is rapidly developing across China, there are still many less developed regions that will keep generating opportunities, such as IT services and electronic products. Many industries in China still lag behind international levels of development. It is expected that the Chinese government will take steps to increase levels of the 13th Five-Year Plan (2016-2020). For example, the Chinese government is introducing reforms and increasing expenditures on healthcare and environmental protection, amongst others. Increased expenditures are likely to result in increased markets for IT solutions, high-performance sensors, and intelligent regulators.

Enthusiasm for fashionable electronic products in China, especially mobile phones and tablets, also provides opportunities. Samsung and Apple have already benefited from this trend. Smart mobile equipment and wearable devices are likely to increase in popularity and therefore offer opportunities to foreign companies.

6. Market Structure

6.1. Telecommunications

**Definition**

Telecommunications is the science and technology of communication at a distance by the transmission of electrical, electromagnetic, or optical signals. This section of the report focuses on the telecommunications industry.

**Figure 1: China's mobile subscribers**

China’s telecommunications industry is dominated by three state-owned enterprises (SOEs): China Mobile, China Unicom, and China Telecom. China Mobile is the world’s largest mobile phone operator, and at the end of 2014, it had more than 800 million subscribers. China Unicom is China’s second largest mobile phone services and telecommunications provider, and China Telecom is the largest fixed-line services and telecommunications provider in China. Figures 1 and 2 present China’s mobile phone subscribers and 3G subscribers in 2014. China Mobile has the largest number of 3G users, with 246 million subscribers.

Communication equipment manufacturers, such as Huawei and ZTE, are important players in China’s local market.

In 2014, 4G was initiated in China, and by the end of the year, China Mobile announced that the number of its 4G subscribers had reached 90 million. China Telecom and China Unicom have fewer 4G users, as China Mobile obtained its 4G licence earlier in the year, leading to a high penetration rate and broader network with more users. (China Unicom and China Telecom have not yet published their 4G user numbers).
According to an MIIT report,\(^{32}\) the total telecommunication revenue from the three providers was EUR 18.9 billion in January and February 2015, representing a decline in growth. This is largely attributed to the fact that voice and SMS service revenues dropped notably by 15% as a result of apps that provide free messaging services, such as WeChat. Simultaneously, the data flow through 3G/4G is increasing and now represents 25% of total telecommunication revenue.

MIIT is encouraging private capital to invest in the MVNO sector. The dominance of China Mobile, China Unicom, and China Telecom in the telecommunications market is expected not to change in the near future. However, it is expected to be more diversified, with more MVNOs entering the market. Many large domestic companies have shown interest in this business. For example, Alibaba has already established a branch company running as an MVNO.\(^{33}\)

### Main Players

- **China Mobile** is the largest company dominating the telecommunications market in China, and it has the largest subscriber base in China.
- **China Unicom** is the only Chinese telecommunications operator listed on the stock exchanges in New York, Hong Kong, and Shanghai.
- **China Telecom** is the largest fixed-line service and the third largest mobile telecommunications provider in China.

### Foreign Presence

- **AT&T** has provided communications services in China for over 25 years. It provides traditional voice and data solutions to multinational business customers through relationships with local telecommunications service providers. AT&T is also one of the main high-speed bandwidth providers for China’s internet service providers (ISPs). AT&T coordinates its operations in China through a wholly foreign-owned enterprise (WFOE) in Beijing and has branches in Shanghai, Guangzhou, and Shenzhen.
- **Nokia Siemens** has 54 offices across located across Mainland China, Taiwan, and Hong Kong, serving customers including China Mobile, China Unicom, China Telecom, Chunghwa Telecom, Taiwan Mobile, and China Railway, as well as enterprises and the government sector.
- **Alcatel-Lucent** China’s head office is located in Shanghai. It mainly serves China Mobile and China Unicom by providing hardware and software solutions.
- **Ericsson** has over 16,000 employees in China. China is Ericsson’s third largest market in the world. Its head office is in Beijing.

### Potential Opportunities for EU SMEs

Below is a list of sub-sectors that EU SMEs could consider exploring in China; companies that have already established a presence in the market are noted after potential opportunity areas:

- Network services and broadband routers (Electronic Media Services\(^{34}\))
6.2. Hardware

Definition

Hardware in this report refers to the physical elements used in ICT, such as computer hardware and smart phones.

Size and Trends

China has become a computer production base in recent decades and is currently regarded as the largest market for computer products in the world. Growing demand from Chinese and international markets has been driving the development of hardware such as computers and mobile phones. Chinese ICT production, including those for export, is mainly concentrated in coastal regions, namely Guangdong, Jiangsu, and Shanghai.

Technology for smart phones and tablet development has been improving rapidly in recent years, which has driven consumption demand and promotes product upgrading.

Mr Bo Su, the deputy minister of MIIT, stated in March 2015 that China’s manufacturing industry is in a revolutionary phase and aims to be innovative, intelligent, and environmentally friendly. He further stated that ICT manufacturing is the key to reaching this target.39

The Chinese government is making great efforts to support the development of computer, integrated circuit, and display technology. High-performance computing, grid computing, and intelligent computing technologies are the key technologies at present. For integrated circuits, there is a focus on developing core chips such as system on chip (SoC) design technology,40 micro-electro-mechanical systems (MEMS) technology,41 and high-density integrated circuits. For display technology, it aims to develop such display components as plasma, organic light emitting, and projection technology.

In January 2015, Premier Li Keqiang visited Makers (‘innovators’) in Shenzhen, where he stressed that the innovative spirit of Makers is very important to China’s development; this represents the

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35 http://www.emeraldcomms.co.uk/
36 http://www.websense.com/
37 http://www.txosystemsinc.com/
38 https://www.mooc-list.com/
39 http://subo.miit.gov.cn/n11293472/n11294447/n11294588/n11295539/16523835.html
40 System on a chip: an integrated circuit (IC) that integrates all components of a computer or other electronic system into a single chip.
41 Microelectromechanical systems: technology for very small devices.
government’s encouragement of innovation.\footnote{http://www.gov.cn/xinwen/2015-01/06/content_2801467.htm}

According to Canalys, a leading market knowledge analyst company, Asia-Pacific (APAC) shipments of notebooks and desktops are expected to decline in 2015; it predicts that shipments of desktops will reach 43.8 million, a year-on-year decrease of 5% and notebooks will reach 62.6 million, a year-on-year decrease of 7.5%.\footnote{APAC client PC forecast overview 2015-2019, Canalys, 29 May 2015.} Canalys further predicts that:

- *China’s client PC\textsuperscript{44} shipments will increase by a compound annual growth rate of 3.3% to reach 101.1 million units in 2019.*
- *Client PC shipments in 2015 will reach 88.6 million, with tablets accounting for 39.9%.*
- *Tablets will account for 52.2% of China’s total client PC shipments in 2019, up from 35.2% in 2014.*
- *Two-in-ones will grow at an average growth rate of 17.7% from 2014, recording 2.7 million units in 2019, accounting for 2.7% of market share.*\footnote{People’s Republic of China (mainland) client PC forecast overview 2015-2019, Canalys, 1 June 2015.}

**Main Players**

- **Lenovo** is a Fortune 500 company. Its products include PCs, tablets, servers, smart phones, and smart TVs.
- **Founder Group** provides industry solutions for hardware and software. It has received investment from international companies such as Omron and Intel. It owns six listed companies worldwide and has over 35,000 employees in China.
- **Haier** started in China as a white goods manufacturer. With its market advantages, Haier’s digital products have gained significant market shares in China.
- **Tsinghua Tongfang** is a high-tech company established in 1997. It focuses on ICT-related areas, including computers, IoT, microelectronics, and digital TVs.
- **Xiaomi** is a Chinese smart phone company that also manufacturers smart TVs and routers and is growing rapidly.

**Foreign Presence**

- **IBM**’s hardware products in China include servers and storage devices; it sold its computer business unit to Lenovo.
- **HP**’s laptop market share in China has been ranked in the top five for several consecutive years.
- **Dell** has had high market shares for the sales of its laptops and servers in China.
- **Apple** is considered one of the top three high-end smart phone manufacturers in the Chinese market.
- **Samsung**’s smart phone sales volume in China has increased, although there is competition from

\textsuperscript{44} Client PCs are defined as desktops, notebooks, two-in-ones, and tablets by Canalys.
many Chinese brands such as Lenovo, Huawei, and Coolpad.

**Potential Opportunities for EU SMEs**

Below is a list of sub-sectors that EU SMEs could consider exploring in China; companies that have already established a presence in the market are noted after potential opportunity areas:

- IC design (Sondrel\(^6\))
- High-tech casings (Laird\(^7\))
- Broadband routers (Electronic Media Services)
- Recycling or re-use of old telecom equipment (TXO systems)
- HealthTech devices (Medpod\(^8\))
- Education and training
- IoT systems (RFID, sensors, wireless, networking) (Neul\(^9\))
- Supply chain of ‘indigenous’ players (Huawei, ZTE, Digital China, Founder)
- Shenzhen hardware ecosystems (Chinese investment)
- Closed-circuit TV (CCTV) cameras (Indigo Vision)
- Optical touch keyboards (Neonode)

### 6.3. Software

**Definition**

Software in this report refers to programmes that are relevant to ICT and provide solutions for particular industry requirements.

**Size and Trends**

China’s software industry has shown steady progression. In 2014, the total revenue of the software industry in China reached over EUR 560 billion.\(^{50}\)

Overall, China’s software market is dominated by local companies, while global software companies currently have an edge in the more high-end software sectors. Local companies are catching up because of the accumulation of experience, increasingly skilled workers, and government support. According to MIIT, the software industry can be divided into six segments:

- Software products
- System integration
- Operation services
- Embedded software
- IT consulting
- IC design

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\(^6\) [http://www.sondrel.com/](http://www.sondrel.com/)
\(^7\) [http://www.lairdtech.com/](http://www.lairdtech.com/)
\(^{50}\) [http://www.miit.gov.cn/n11293472/n11293832/n11294132/n12858477/16421558.html](http://www.miit.gov.cn/n11293472/n11293832/n11294132/n12858477/16421558.html)
Figure 3 shows the revenue of China’s software industry in 2014.\textsuperscript{51} Software production was the largest market followed by system integration.

![China's software industry chart]

\textit{Figure 3: China’s software industry}

Software as a service (SaaS) technology is an on-demand information technology trend. SaaS applications such as Web conferencing and team collaboration activities already occupy huge markets. CCW Research, a research organisation, pointed out that SaaS in China developed suddenly in 2014, especially in the development of tools such as online meetings, education, training, and games as demand has grown.\textsuperscript{52} In 2014, there were over 38,000 software companies (medium-sized or large) in China.\textsuperscript{53}

China’s government is taking steps to crack down on online sharing and intellectual property rights (IPR) infringements. For instance, on 10 June 2015, the National Copyright Administration, the Ministry of Public Security, and MIIT announced plans to take action against internet piracy regarding the illegal sharing of online music, apps, games, literature, and software.\textsuperscript{54}

Console gaming is an area that offers potential opportunities for companies. At present, pirated CD games dominate the market because of their low prices.\textsuperscript{55} However, if piracy issues could be solved, opportunities may arise for companies.

**Main Players**

- **Kingdee** provides enterprise management software and cloud services to companies and government organisations in China.

- **ZTE** is a leading provider of telecommunications equipment and network solutions.

- **Neusoft** is a large IT solutions and services provider in China with a global presence. It covers industries including mobile, automotive, medical, business process outsourcing, finance, security

\textsuperscript{51} http://www.miit.gov.cn/n11293472/n11293832/n11294132/n12858477/16421558.html.

\textsuperscript{52} http://www.ccwresearch.com.cn/report_detail.htm?id=262147.

\textsuperscript{53} http://www.miit.gov.cn/n11293472/n11293832/n11294132/n12858477/16421558.html.


and insurance, and information technology.

- **Founder Group** provides industry solutions for hardware and software. It has received investment from international companies such as Omron and Intel. It owns six listed companies worldwide and has over 35,000 employees in China.

- **Haier** started in China as a manufacturer of white goods. With its market advantages, Haier’s digital products have gained significant shares in China.

**Foreign Presence**

- **Microsoft** is a world-leading company in computer science. Its head office in China is located in Beijing.

- **Oracle** entered the Chinese market in Beijing in 1989. It is one of the largest software providers in the world.

- **SAP** established a China branch company in 1995. It now has a presence in several cities in China.

- **Cisco** started its business in China in 1994 by setting up a representative office in Beijing. In 2014, it established headquarters in Hangzhou.

- **IBM** provides industries with IT solutions and digital products.

**Potential Opportunities for EU SMEs**

Below is a list of sub-sectors that EU SMEs could consider exploring in China; companies that have already established a presence in the market are noted after potential opportunity areas:

- Logistics software (Paragon Software[^56])
- Network security software (Websense)
- Graphics processing software
- Software consulting
- Embedded software (IoT)
- Game design (Rockstar[^57])
- Education and training
- Automated software testing (Testplant[^58])

**6.4. IT Services**

**Definition**

In this report, IT services focus on services for information technology and interactions with users.

[^56]: http://www.paragon-software.com
[^57]: http://www.rockstargames.com/
[^58]: http://www.testplant.com/
Size and Trends

China’s IT services industry has developed rapidly in the past five years because of growing local demand and government support. IBIS World, a market report provider, estimated in October 2014 that the IT service industry revenues would reach EUR 104 billion in 2014. Many internet-based IT services, such as mobile apps, e-commerce, online gaming, and cloud computing have become increasingly popular in China.

China’s mobile app market is developing with an ever-increasing number of smartphone users. Many apps have more than 100 million users, such as Tencent’s WeChat, an instant messaging (IM) service for mobile phones that had more than 500 million users in China by the end of 2014.

The Chinese e-commerce market is highly developed. There were 310 million e-shoppers in China by the end of the first quarter of 2014. In 2014, the value of China’s e-commerce transactions reached EUR 1.95 trillion, a year-on-year increase of 25% or half of the total retail sales in 2014.

Gaming is one of the largest and fastest growing markets in China; it generated EUR 17 billion in 2014 with around 517 million users. Online gaming is becoming a very important business unit for many companies. For instance, in 2014, Netease’s total revenue was EUR 1.8 billion, of which EUR 1.5 billion was from online gaming.

Cloud computing is also making progress and is expected to drive the next growth cycle forward for the ICT sector. CCW Research also estimated that, in 2014, the market size of cloud services reached EUR 24.8 billion, a year-on-year increase of 28%. China is rapidly developing cloud computing, covering all relevant technologies and applications – cloud data centres, broadband usage, software services, and terminal installations. Many internet technology companies are already using cloud services, such as Alibaba, Tencent, and Baidu.

Main Players

- Tencent was founded in 1998 and has grown to become one of China's largest and most frequently used internet service portals. Tencent provides value-added internet, mobile, and telecommunication services and online advertising.

- Baidu was established in 2000 and is the largest Chinese language search platform, providing full internet applications such as cloud computing, games, and documentaries.

- Alibaba was established in 1999 and has grown to become a global leader in online and mobile commerce. Its related companies operate leading wholesale and retail online marketplaces as well as internet-based businesses offering advertising and marketing services, electronic payment, cloud-based computing, network services, and mobile solutions.

59 http://www.ibisworld.com/industry/china/it-services.html
62 http://www.bj.xinhuanet.com/hbpd/hbrj/rjy/2014-05/05/c_1110544369.htm
63 IDC China eCommerce Market Report
64 http://game.163.com/15/0210/07/AI2VKNDK00314K8F.html
• **Netease** was founded in Guangzhou in 1997 and is a leading internet technology company in China. It develops internet applications such as a mailbox and cloud services.

• **Insigma** is a global strategic service provider working with Fortune 500, mid-sized, and small companies to bring innovation and competitive differentiation to their businesses. Insigma leads in the areas of e-government, social security, citizen cards, digital city management, city information resources directory and exchange systems, and smart transportation.

**Foreign Presence**

• **IBM**’s hardware products in China include servers and storage devices; it sold its computer business unit to Lenovo.

• **HP**’s laptop market share in China has been ranked in the top 5 for several years.

• **Dell** has had high market shares for sales of its laptops and servers in China.

• **Microsoft** provides games and communication platforms such as Skype and Outlook.

• **Ubisoft** was established in Shanghai in 1996. Its game products are very popular in China.

**Potential Opportunities for EU SMEs**

Below is a list of sub-sectors that EU SMEs could consider exploring in China; companies that have already established a presence in the market are noted after potential opportunity areas:

• Travel/e-commerce (Skyscanner\(^{66}\))
  • Game design (Rockstar)
  • Mobile apps (numerous peer global platform system)
  • IT outsourcing (Emerald Communications)
  • Cloud services (must be hosted in China)
  • Ecommerce operations (Amazon are on Tmall\(^{67}\))
  • Education and training
  • Digital marketing (RedAnt, \(^{68}\) ReadingRoom, \(^{69}\) Beabloo, \(^{70}\) Trisonacustica\(^{71}\))

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\(^{68}\) [https://www.redant.com/](https://www.redant.com/).


7. The ICT Value Chain and Main Players

While by no means comprehensive, Table 2 presents the more visible ICT players in China.

*Table 2: ICT players*

<table>
<thead>
<tr>
<th>Network infrastructure suppliers</th>
<th>Network operators and service providers</th>
<th>Suppliers of computer/mobile hardware and software</th>
<th>Media, providers, platforms</th>
<th>Content e-commerce platforms</th>
<th>ICT consultants and systems integrators</th>
<th>Web/app/game developers and design/marketing agencies</th>
<th>Distributors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreign</td>
<td>Alcatel-Lucent Networks Ericsson Cisco Nokia-Siemens AT&amp;T</td>
<td>IBM HP Dell Apple Samsung Microsoft Oracle SAP, Cisco CDC Software</td>
<td>Amazon Groupon</td>
<td>IBM HP</td>
<td>OligyOne Ubisoft Electronic Arts Rovio</td>
<td>Ingram Micro</td>
<td></td>
</tr>
</tbody>
</table>
Among the listed companies, the major players losing out have included Google, Groupon, Amazon, Eachnet (eBay), HP, Nokia, ZTE, and Dangdang; their market share is decreasing because of competition difficulties of the business environment in China. Meanwhile, other players, such as Samsung, Lenovo, Xiaomi, Meizu, Alibaba, Jingdong, Tencent, and Baidu, are proving successful in taking advantage of the market opportunities from the rapid development of mobile internet and smart terminals.

8. Opportunities for EU SMEs

China’s ICT industry has developed rapidly and is not far behind the international level. Although domestic ICT companies dominate the Chinese market, there are still opportunities for EU SMEs in sectors such as innovation and creativity.

As China’s government aims to move away from reliance on foreign technology, in the coming decades, training and consulting in high technology could be a long-term opportunity for EU SMEs. For example, IC design companies in China are encouraged to cooperate with foreign companies that can provide leading technology.72

In the short term, niche markets may present opportunities for EU SMEs; niche markets are not limited to those listed below, as market trends will lead to new niche markets. These niche markets include the supply chain of the gaming industry, smart phones, apps, intelligent households, wearable devices, IoT, and industry solutions (automation, high precision, low cost).

8.1. Niche Markets

Gaming

With a huge 3G and 4G-subscriber base, mobile online game user numbers are increasing rapidly because of the better user experience enabled by high-speed networks. In 2014, China’s gaming industry revenue was worth EUR 22.8 billion, of which mobile gaming accounted for EUR 4 billion.73 The most popular and profitable segments are those still using virtual currency/tool and extra features (e.g., online role-play games – RPG – based on Chinese culture) or free games with ads. Nevertheless, the RPG market in China is difficult to enter for EU SMEs, as they often lack an understanding of Chinese culture or the traits of characters.

Mobile developers/publishers are also seeking to expand into the international mobile game market, and they have growing ambitions. Content design, publishing, and marketing should be localised, catering to local market demand, which may bring opportunities for local SMEs in the game industry.

For example, Chinese mobile game publisher Allstar Games will launch in the UK in 2015 and is spending EUR 3.8 million on the venture to promote both Allstar Games and Allstar Heroes. During 2015, Allstar Games will invest EUR 9.3 million in its marketing campaign across Europe.74

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In addition to the localisation of Chinese games in Europe, there are also opportunities for EU game companies to identify game publishers or distributors for their own developed games in China.

For instance, one of the top IT companies in China, NetEase, currently distributes international mobile games. It recently cooperated with Social Networking Games (SGN) to release the popular mobile game Cookie Jam from SGN on NetEase’s platform. NetEase conducted the translation and localisation of the game.

**Telecommunication**

5G is in the spotlight in China even though 4G is not yet popularised. Major market players such as Huawei and China Mobile are investing in this area. Professional expertise in specific sectors from EU SMEs may be welcomed.

In addition, mobile virtual network operators (MVNOs) have opened with limitations. An eligible company must have domestic owners with more than 50% investment. For companies listed overseas, the foreign company shares held should be less than 10%.

With the world’s largest telecommunication subscriber pool, there is a large profit potential for EU SMEs that have industry experience and the ambition to expand into China.

**Internet of Things**

IoT is an important sector encouraged by the Chinese government. It has comprehensive application fields, such as ‘smart cities’ with intelligent transportation and healthcare. ICT is vital for mechanising manufacturing, as opposed to traditional manual manufacturing techniques, and is beneficial to various sectors in making operations more efficient and accurate.

For example, the smart auto is emerging in China, and many leading local ICT companies are pursuing opportunities together with car manufacturers, aiming to build the world’s largest car consumer market. Huawei has already established partnerships with two large SOEs, Dongfeng and Chang’an. Huawei plans to provide car networks with intelligent communications.

Generally, in the IoT system and other related industries, sensor technology and high-performance chips are designed for robust, dynamic, and compatible systems; however, in China, these areas are relatively weak, and this is a potential area where EU SMEs have a technological advantage.

**IT outsourcing**

75 NASDAQ: NTES.
76 http://www.sgn.com/.
77 http://ssqq.163.com/.
78 http://www.miit.gov.cn/n11293472/n11293832/n11293907/n11368223/15417711.html.
79 IDC China 100 Smart Cities Insights.
80 http://www.dfmc.com.cn/index.aspx; Dongfeng has JV brands with Peugeot and Nissan.
China’s efforts to become a future IT outsourcing powerhouse are supported by both the central and local governments. Various science parks have been built in different cities with a focus on outsourcing services. Within these parks, both foreign and Chinese companies can benefit from favourable policies (subsidies and tax rebates). In addition, for well-established European companies in China that need to outsource part of their business process, the parks also provide market potential.

Most of the world’s 500 Fortune companies have a presence or have invested in China. Though there are many domestic IT companies, EU SMEs with expertise still have opportunities for cooperation with large international companies that focus on their own business area and are therefore keen to outsource IT services, including ICT companies themselves. An example is a Shanghai-based IT service company, Newtouch Software, which has established local offices in many major cities in China and serves Alibaba, Dell, and Lenovo.

8.2. Opportunities by Region

China is not a single market, and it is important to understand more about the differences in each of its regional markets. Various regions in China have different focuses; for instance, Guangdong Province is a manufacturing centre for electronic parts and consumer products, Dongguan, a third-tier city, is an important manufacturing location for computers and telecommunication equipment, and in Jiangsu Province, it was recently reported that over 360 companies from the world’s Fortune 500 list had invested in the province.83

Outsourcing opportunities may be focused in Hangzhou, the capital city of Zhejiang Province, which is also an ICT cluster where many top local companies such as Alibaba are located. The Shanghai Zhangjiang High-Tech Park is a leading industry park in China. There are over 140 companies in the integrated circuit industry and over 300 companies in software development, e-publishing, online games, and animation.84 Zhongguancun in Beijing is the hub for top universities and has a high concentration of R&D organisations. Many science parks have been created around Zhongguancun with support from both the central and local governments.

9. Challenges

9.1. Policy/Regulation-Led Market Barriers

National information security strategy

In February 2014, the Leading Group for Central Network Security and Informatisation was established, chaired by President Xi Jinping. In mid-2015, the Leading Group will publish a report detailing the national strategy and planning on information security.85 The Leading Group’s report is expected to recommend IT infrastructure localisation for all nationally critical areas and to support indigenous enterprises.

The Leading Group plans to build an information security network that can be applied to office software, servers, PC operating systems, and databases to achieve full localisation. The preliminary

83 http://news.163.com/15/0401/03/AM383OS100014Q4P.html.
test of domestic-made central processing units (CPUs) and PC operating systems in selected
government and state-owned enterprise (SOE) offices has already begun. It is expected that alternative
larger domestic IT infrastructure programmes will be implemented in other key national organisations,
including the Communist Party and central government offices and national defence, finance, and
insurance departments.

The central government is focusing its attention on national information security and is determined to
courage and support the localisation of IT hardware infrastructure and related technology. However,
it is unlikely that local alternative IT infrastructure programmes will be compulsory for regional
offices and expanded to commercial procurement.

Particularly, to control internet information, internet content provider (ICP) licenses are required for
all internet information/service providers in China.  

**Government procurement practices favouring local companies**

Some international leading IT equipment and service providers have been excluded from the central
government’s procurement list since mid-2014; this includes companies such as Apple, Kaspersky,
Symantec, IBM, and Microsoft.

Information released by an IT engineer who worked for the Public Security Organisation showed that,
in the past few years, IBM was one of the brands that the organisation purchased for IT infrastructure
enhancement. However, since 2014, all related suppliers have been changed to Chinese companies
such as Huawei, ZTE, Inspur, and Lenovo. Such practices have been widespread across
government offices and SOEs, such as the Ministry of Finance, National Development and the
Reform Commission (NDRC) and other national departments, which were given targets to achieve
100% local IT product procurement services.

According to market insiders’ analysis, this was a result of the impact of the ‘Snowden event’ in
June 2013, resulting in the central government’s determination to achieve the localisation of IT
suppliers to guarantee information security.

Although this type of procurement plan will not be implemented at all levels of the government and in
all SOEs, it will potentially influence other procurement plans.

**Limited practical significance of the Shanghai Pilot Free Trade Zone**

Shanghai was the first city in China to establish a Pilot Free Trade Zone, which has opened new areas
for foreign investment, including telecommunications. However, industry analysts hold opposing
views on whether this will fundamentally change the telecommunications industry or create new
opportunities in value-added services, including application stores, call centres, internet access, and
internet virtual networks.

The three major telecommunication operators (China Mobile, China Unicom, and China Telecom)
have built a well-established network across China. It would be difficult for competitors to enter into
this market, even if they were only investing to make a profit, as these companies dominate the
market. Unless major policy changes are announced in the Shanghai Pilot Free Trade Zone, it will
remain difficult to enter this market.

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86 [http://www.gov.cn/fwxx/bw/gjgbdydszl/content_2263004.htm](http://www.gov.cn/fwxx/bw/gjgbdydszl/content_2263004.htm).
88 [http://www.cnii.com.cn/industry/2015-04/03/content_1556426.htm](http://www.cnii.com.cn/industry/2015-04/03/content_1556426.htm).
**Foreign-owned shares sold at a high-price**

The market to purchase shares in the three SOE telecommunications companies has opened provisionally to foreign investment. Spanish telecommunication provider Telefonica and British telecommunication provider Vodafone were allowed to purchase shares in China Unicom and China Mobile. Vodafone purchased 3.2% shares of China Mobile for approximately EUR 3.03 billion.

According to a market insider, holding a small portion of China Mobile, China Unicom, and China Telecom shares would not allow a company to make significant changes. Investing in one of these three large telecommunications companies requires large investments, thus making it almost impossible for SMEs to make an impact and purchase shares within these companies. However, if these companies become more internationalised in the future, the scope to work with them more closely may change.

### 9.2. Operational Challenges

**No tax refund**

In an earlier stage of China’s reform and opening-up, the Chinese government issued a series of tax refund programmes to attract more overseas investment; however, after 30 years of development, the government has started to reconsider the benefits granted to foreign enterprises and has gradually withdrawn and adjusted the programme since 2006.

At the end of 2010, the Chinese government stated that foreign enterprises will no longer be eligible for additional tax benefits.

**Human resource management**

Human resources are often seen as the most prominent challenge for foreign companies, particularly for SMEs. Retaining dedicated staff in key positions often proves difficult, resulting in high staff turnover. The turnover of staff in the ICT industry is much higher than the average staff turnover rate, particularly for middle-level engineers and project manager positions, especially those who have good industry knowledge and technical skills. Companies need to consider the amount of time required to find experienced and capable managers for local entities in China. The rapidly growing cost of labour is another factor that should be accounted for in long-term human resource planning.

**Rise of office rents**

In line with the general trend of increasing property prices in China, office rent in China has risen dramatically in recent years. Some companies have reported an increase of over 50% since 2008, especially in first-tier cities such as Beijing and Shanghai. Unanticipated and unexpected rises in office rents have exerted pressure on EU SMEs when establishing and maintaining business operations in China. Although companies within an ICT cluster may receive subsidies for rent, the price of office space is still challenging for EU SMEs.

### 10. Practical advice for EU SMEs

In Europe, SMEs are recognised as a key source of growth, entrepreneurship, innovation, competitiveness, and employment. SME’s generally have access to fewer resources compared to

larger companies, and this increases the complexities and challenges when entering a new market, especially in the Chinese ICT market. Although the Chinese market presents opportunities, EU SMEs face several challenges when entering the market. EU SMEs should assess the opportunities and challenges and develop informed decisions to identify whether and how to enter the market. This section outlines practical advice for SMEs to consider when approaching the Chinese market.

**Understand the market**

Companies often make decisions to expand their business without conducting in-depth market research to understand both the risks and opportunities, resulting in misconceptions and negative consequences. The Chinese ICT market is more complex than most markets because of government regulations, standards, customers, distribution, and competitors, which are areas that must be researched prior to entering the Chinese market. To gain a further understanding of the market, many companies consult experienced support organisations, such as a local chamber of commerce, trade associations, or established consulting firms with local knowledge and proven networks.

The EU SME Centre has published a diagnostic toolkit titled ‘Are You Ready for China?’ which provides a step-by-step introduction to the Chinese business environment that allows SMEs to gauge their preparedness in conducting business in China. The documents can be downloaded from the Centre’s website at [http://www.eusmecentre.org.cn/content/diagnostic-kit](http://www.eusmecentre.org.cn/content/diagnostic-kit).

**Be present in the market**

EU SMEs should use market research reports to provide background information about the market. Companies should also become present in the market, which will require multiple visits to China to communicate and meet with market players, which could include industry associations, potential partners, customers, competitors, investors, and research firms. By being present in the market, EU SMEs can develop networks and their companies’ physical presence. SMEs will benefit from using this by gaining a comprehensive overview of the macro- and micro-level ICT market and making contacts within the industry, which are vital for long-term business growth in China.

**Focus on a niche market**

It is advisable for EU SMEs to focus on a specific niche market in China in which they have expertise or specialised knowledge and products to make them stand out in the market, as the ICT market has an extensive range. Section 7 of this report outlines potential opportunities that EU SMEs may consider, as they may have a competitive advantage specific to the Chinese ICT market.

**Build partnerships with local industry leaders**

Partnerships are particularly important when entering the Chinese market, and it is advisable for SMEs to partner with industrial leaders to make suitable investments in terms of future trends for technological developments. Chinese partners will be able to assist with regulations, technology advancement, and standards, which are areas where potential challenges may occur. International players in the Chinese market dominate the main standards and core technologies. However, domestic players such as Huawei are rapidly becoming industrial leaders in the local and international markets. EU SMEs should consider partnerships with Chinese industry leaders to understand the market and to
develop unique competencies in the industrial value chain.

Potential cooperation partners for EU SMEs may be domestic companies that lack ICT-related knowledge where EU SMEs can assist, and in return, domestic companies may be able to provide established sales networks and China-specific knowledge. This method will enable EU SMEs to focus on technologies and solutions that involve lower risk and investment.

SMEs’ long-term strategy could include potential partnerships with academies and institutions, as they will have access to up-to-date market trends, and they can expand their business networks. Tsinghua University, for example, has established joint science research with institutions, governments, and large enterprises. If EU SMEs have affiliations with well-known Chinese universities, local potential partners/clients they may look upon them more favourably. This is also a method that EU SMEs can use to strengthen their branding in China and increase their presence and networks.

EU SMEs can take several steps when initiating market entry, such as establishing partnerships through personal contacts, as well as participating in trade fairs and exhibitions to expand their understanding of the market and network of contacts. After the initial testing stage, it is advisable to establish long-term partnerships and strategies that can be developed with support from well-established consulting firms.

**IP and due diligence**

To obtain patent protection in China, the inventor or the owner of the invention must file a Chinese patent application. The Chinese State Intellectual Property Office (SIPO) is the government authority that receives and examines patent applications.

IP protection measures should not be limited to filing patent applications. It is advisable to implement an overall IP strategy covering legal, technical, administrative, and political factors. It is also recommended to find a third party to conduct due diligence investigations when preparing to establish partnerships with local companies.

For further guidance on IPR related issues, the China IPR SME Helpdesk can provide you with free of charge, confidential, business-focused IPR advice. Reach their experts at: [http://www.china-iprhelpdesk.eu/](http://www.china-iprhelpdesk.eu/)

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11. Report Summary

Table 3: Challenges and opportunities in each ICT sector

<table>
<thead>
<tr>
<th>Telecommunications</th>
<th>Hardware</th>
<th>Software</th>
<th>IT Services</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Legal challenges</strong></td>
<td>Licence required</td>
<td>Certification required</td>
<td>Non-transparent government procurement</td>
</tr>
<tr>
<td></td>
<td>Restriction on foreign companies for basic services and value-added services (OTT and others)</td>
<td>Weak enforcement of legal action against IPR infringement</td>
<td></td>
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<tr>
<td></td>
<td>Complicated certification</td>
<td>Non-transparent government procurement</td>
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<td></td>
<td>Dominated by large local players</td>
<td>High competition from both domestic and international players</td>
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<td></td>
<td>Moving to 4G technology</td>
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<td></td>
<td>Local competition</td>
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<tr>
<td><strong>Market challenges</strong></td>
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<td></td>
<td>Hard to recruit experienced experts</td>
<td>Increasing labour cost</td>
<td>Increasing labour cost</td>
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<td></td>
<td>Large capital investment needed</td>
<td></td>
<td>High cost of rents</td>
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<tr>
<td><strong>Operational challenges</strong></td>
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<tr>
<td><strong>Niche markets</strong></td>
<td>5G</td>
<td>IoT equipment</td>
<td>Mobile apps</td>
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<td></td>
<td>Value-added services</td>
<td>5G</td>
<td>IT outsourcing</td>
</tr>
<tr>
<td><strong>Opportunities by region</strong></td>
<td>Hangzhou</td>
<td>Yangtze Delta</td>
<td>Zhongguancun</td>
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<tr>
<td></td>
<td>Suzhou</td>
<td>Pearl River Delta</td>
<td>Beijing</td>
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<td>Dongguan</td>
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<td>Shenzhen</td>
<td>Hangzhou</td>
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</table>
12. Resources

12.1. Further Reading

### Further Reading

<table>
<thead>
<tr>
<th>Resource</th>
<th>URL</th>
<th>Publisher</th>
<th>Published Date</th>
<th>Accessed Date</th>
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</thead>
</table>
12.2. Exhibitions

<table>
<thead>
<tr>
<th>Exhibitions</th>
<th>Date</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The 7th China International internet of Things Technologies and Application Exhibition, Shenzhen, 2015</strong></td>
<td>20-22 August 2015</td>
<td><a href="mailto:rfidabc@gmail.com">rfidabc@gmail.com</a></td>
</tr>
<tr>
<td>The exhibition offers a platform for businesses in the RFID, information perception, and smart sensor sectors.</td>
<td></td>
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</tr>
<tr>
<td><strong>12th Asia Electronics Exhibition in Shanghai (AEES 2015)</strong></td>
<td>13-15 November 2015</td>
<td><a href="mailto:aees@ceac.com.cn">aees@ceac.com.cn</a></td>
</tr>
<tr>
<td>AEES is organised by five leading electronic exhibition organisers in Asia. AEES promotes cooperation between Chinese and overseas electronics and IT enterprises.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Maker Faire Shenzhen 2015</strong></td>
<td>19-21 June 2015</td>
<td><a href="mailto:info@chaihuo.org">info@chaihuo.org</a></td>
</tr>
<tr>
<td>Exhibitors can demonstrate their products or services and exchange ideas with like-minded companies. It also provides a platform for companies to get in touch with potential customers or investors.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>NEPCON China 2016</strong></td>
<td>26-28 April 2016</td>
<td><a href="mailto:tim.wang@reedexpo.com.cn">tim.wang@reedexpo.com.cn</a></td>
</tr>
<tr>
<td>NEPCON China is one of the largest and longest running trade and sourcing events in Asia, featuring well-known brands in electronics manufacturing.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SEMICON China 2016</strong></td>
<td>15-17 March 2016</td>
<td><a href="mailto:semichina@semi.org">semichina@semi.org</a></td>
</tr>
<tr>
<td>SEMICON China is one of the most important events for the semiconductor industry in China.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>China (Shanghai) International Technology Fair (CSITF)</strong></td>
<td>23-25 April 2015</td>
<td><a href="mailto:saiges@csitf.com">saiges@csitf.com</a></td>
</tr>
<tr>
<td>CSITF is a national-level fair specifically for international technology trade.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ITS EXPO</strong></td>
<td>24-26 June 2015</td>
<td><a href="mailto:overseas_market@cps.com.cn">overseas_market@cps.com.cn</a></td>
</tr>
<tr>
<td>ITS is one of the largest intelligent transportation industrial expos in Asia.</td>
<td></td>
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</tbody>
</table>
China Beijing International High-tech Expo (CHITEC)
http://english.chitec.cn/
CHITEC is an annual technology expo held in Beijing sponsored by a number of national government agencies.
Dates for 2016 have not yet been announced.
Email: zhangzhiliang@ccpitbj.org

INT’L SOFT China 2015
INT’L SOFT China 2015 is organised by MIIT and is an important software expo held in Beijing.
Dates for 2016 have not yet been announced.
Email: xum@css.com.cn

China Digital Entertainment Expo & Conference (China Joy)
http://en-2015.chinajoy.net/
China Joy is a leading event in China covering gaming, comics, and other relevant industries.
30 July-2 August 2015
Email: tom_sun@howellexpo.com

For more updated exhibition information, please visit the EU SME Centre website.
http://www.eusmecentre.org.cn/events

12.3. Useful Websites

<table>
<thead>
<tr>
<th>Useful Websites</th>
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<tbody>
<tr>
<td><strong>Ministry of Information and Industry (MIIT)</strong></td>
<td>The latest statistics on China’s ICT and telecommunications industries from the Chinese government.</td>
</tr>
<tr>
<td><a href="http://www.miit.gov.cn">www.miit.gov.cn</a></td>
<td></td>
</tr>
<tr>
<td><strong>China internet Network Information Centre</strong></td>
<td>The latest statistics on internet usage in China.</td>
</tr>
<tr>
<td><a href="http://www.cnnic.net.cn/en/index/">http://www.cnnic.net.cn/en/index/</a></td>
<td></td>
</tr>
<tr>
<td><strong>Chinese Academy of Telecommunication Research of MIIT</strong></td>
<td>Professional research report on China’s ICT industry.</td>
</tr>
<tr>
<td><a href="http://www.catr.cn/">http://www.catr.cn/</a></td>
<td></td>
</tr>
<tr>
<td><strong>EU Commission – DG Trade</strong></td>
<td>DG Trade provides a large number of guides, research reports, and policy documents for all sectors and trading partners.</td>
</tr>
<tr>
<td><a href="http://trade.ec.europa.eu/doclib">http://trade.ec.europa.eu/doclib</a></td>
<td></td>
</tr>
<tr>
<td><strong>National Development and Reform Commission (NDRC)</strong></td>
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<tr>
<td>------------------------------------------------------</td>
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<tr>
<td>The NDRC monitors social and economic development in China and formulates the country's overall strategic plan and industry policies.</td>
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<thead>
<tr>
<th><strong>Tech Crunch (China)</strong></th>
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<tbody>
<tr>
<td>Tech Crunch is a leading source of information regarding the tech industry in China and around the world.</td>
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<tr>
<th><strong>36kr.com</strong></th>
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<tbody>
<tr>
<td>36kr.com is a tech blog that covers news about start-ups and connects companies to investors.</td>
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<thead>
<tr>
<th><strong>Cnbeta.com</strong></th>
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<tbody>
<tr>
<td>Cnbeta.com a leading source of news for the ICT sector in China.</td>
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</table>
12.4. Referenced Companies

<table>
<thead>
<tr>
<th>Referenced Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>China Unicom: <a href="http://eng.chinaunicom.com/">http://eng.chinaunicom.com/</a></td>
</tr>
<tr>
<td>Haier: <a href="http://www.haier.net/en/">http://www.haier.net/en/</a></td>
</tr>
<tr>
<td>Xiaomi: <a href="http://www.xiaomi.cn/">http://www.xiaomi.cn/</a></td>
</tr>
<tr>
<td>Ubisoft: <a href="https://www.ubisoft.com/">https://www.ubisoft.com/</a></td>
</tr>
</tbody>
</table>
The EU SME Centre helps EU SMEs prepare to conduct business in China by providing a range of information, advice, training, and support services. Established in October 2010 and funded by the European Union, the EU SME Centre has entered its second phase, which will run until July 2018.

The EU SME Centre is implemented by a consortium of six partners: the China-Britain Business Council (CBBC), Benelux Chamber of Commerce, China-Italy Chamber of Commerce, French Chamber of Commerce in China, EUROCHAMBRES, and European Union Chamber of Commerce in China. All services are available on EU SME Centre’s website after registration: www.eusmecentre.org.cn.

This report was compiled in partnership with the CBBC as an introduction to the ICT market in China to help EU SMEs gain an understanding of China’s ICT market and identify opportunities that they could consider exploring.

The CBBC is the leading organisation helping UK companies grow and develop their businesses in China. The CBBC delivers a range of practical services, including advice and consultancy, market research, event management, overseas market introduction, trade missions and exhibitions, and the setting up of rep offices. For more information about how the CBBC can help your business develop in China, please visit www.cbbc.org.

Contact the Centre at
Room 910, Sunflower Tower - 37 Maizidian West Street - Chaoyang District - Beijing, 100125
T: +86 10 8527 5300; F: +86 10 8527 5093
www.eusmecentre.org.cn ; info@eusmecentre.org.cn

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Date: July, 2015.

The EU SME Centre is an initiative implemented with the financial support of the European Union.