Smart Cities in China, Global Opportunities
Kirk Wilson, 14 March 2018

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Get Ready for China!

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About the EU SME Centre

- A project funded by the European Union in 2010 to help European small and medium-sized enterprises (SMEs) get ready to do business in China
- Implemented by six chambers of commerce
- Based in Beijing
Achievements of the EU SME Centre

Strong Content and Expertise
• Over 140 comprehensive market reports, guidelines and case studies are available to download from our website
• Over 3600 enquiries answered covering the total 28 member states

Popular
• Over 10,000 registered users, increasing by 200 a month
• 412 trainings in EU and China, 119 webinars – 18,688 participants trained

Well Connected
• 316 engaged trade support partners in the EU and China
• 188 experts in expert network
• An Enterprise Europe Network partner (EEN)
Kirk Wilson is a former Executive Director of China Britain Business Council where he led an experienced team of 120 industry experts, consultants, project managers and economists across 13 cities in China. A former United Nations consultant, he’s lived in China for 8 years and is a fluent Chinese speaker with 19 years ICT experience including AI, eCommerce, Cybersecurity, Smart Cities, IT Services, and Integrated Circuits. Kirk holds an MBA from Cambridge University and BSC in AI/Computer Science from Edinburgh.

Active across Europe and China in Management consultancy, Government advisory, strategy development, research, networking, training, negotiation support, and facilitated events.
Agenda

• China’s Smart City Market Overview

• Sector Review: Smart Energy, Smart Transportation, Smart Healthcare, Smart Education (+Case Studies)

• Drivers: Macro trends and New Generation ICT

• More Case Studies

• China Strategy

• Summary / Q&A
Chapter 1: China's Smart City Market Overview
National Development and Reform Commission (NDRC) promoting and driving Smart City builds, from the perspective of new urbanisation.

Ministry of Industry and Information Technology (MIIT) policy, standard and evaluation process for informatisation

Ministry of Housing and Urban-Rural Development (MOHURD) has led and organised pilot Smart City identification in China. The Digital City Engineering Research Center is managed by MOHURD

Ministry of Finance (MOF) allocation, monitoring and control of budgets in Smart City builds.

Local/City Governments FAO (local implementation plans vary widely)

**Challenge:** No Clear Working Mechanism among All Government Departments, no coherent set of Smart City regulation
Focus Areas
Innovation (ICT in place of heavy industry)
Balancing (Urban rural, East West divides)
Greening (electric cars, renewable energy, anti-pollution)
Sharing (similar to balancing)

Policies
Support for Makers/entrepreneurs
Made in China 2025 (Quality, indigenous innovation, more academic research into applications, more diverse economy)
Rule of Law (better IPR, more qualified judges)
Follow through with Military reform, Urbanisation, and One Child Policy Reform

Belt & Road Initiative (BRI)
Is now at the core of most economic/trade policy moves
Global Smart Cities market to reach US$1.56 trillion by 2020  
**Frost & Sullivan**

Total market size of China’s Smart City build (exc related equipment/automation applications) could reach USD 28 billion USD in 2020.  
**International Data Corporation (IDC)**

National Development Bank (NDB) agreement with MOHURD on national Smart Cities investment EUR 11.8 billion (RMB 80 billion) (new plans in 13-5 plan)

Around 400 MOHURD pilot Smart Cities, enlargement projects, and special projects
China’s smart city IT market size

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<th>Year</th>
<th>Market size (US$b)</th>
<th>Compound annual growth rate (%)</th>
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<td>2020*</td>
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Source: IDC China

*Forecasts

SCMP
Juniper Research 2017 "global market landscape has shifted over the past 18 months, from one that was primarily technology-driven, to one where policy plays an increasingly important role." China is at the forefront of Government led, policy driven development but...

Legal and Regulatory Issues: A lot of ‘guidance’ but few practical regulations around data protection, standardisation, information sharing, definitions etc. (some progress is 2017 e.g. on data protection). PPP Model discussed widely, but definitions and best practice unclear. (model applicability to China is also questioned); No clear working mechanism between Gov departments

Market Barriers: Master Planning approach inconsistent; poor data openness; poor information sharing between governments/companies (incompatible bespoke solutions); Data and privacy protection; PPP Model poorly understood; Dumb-Cities real estate projects based on incentives; Cybersecurity Regulations and National Information Security Strategy (EUSME ICT Report)

Localisation: Particular challenges interpreting Chinese cultural aspects of city design, behaviour, data analysis, citizen expectations
National information security strategy: Leading Group of Central Network Security and Informatization, chaired by President Xi Jinping. (cybersecurity regulations)

Government procurement practices favouring local companies: Excluded from government’s procurement list: Apple, Kaspersky, Symantec, IBM, and Microsoft. Effectively banned Facebook, Google, Twitter, many cloud services.

Limited practical significance of Pilot Free Trade Zones

End of Low-Zero Tax Environment

High talent turnover rate and lack of investment in training

Rising cost of rents and salaries
Chapter 2: Sector Review: Smart Energy, Smart Transportation, Smart Healthcare, Smart Education
Smart Applications

**SMART Education**
- Remote learning
- School based ICT
- Sensors and feedback
- Biomeasures

**SMART Infrastructure**
- Water management
- Traffic Management
- Security (CCTV)
- Lighting and power

**SMART Transport**
- Smart logistics
- Vehicle rental Apps
- Connected vehicles

**SMART Buildings**
- Presence sensors and environment control
- Utility metering
- Security management

**SMART Energy**
- Voltage, fault and power monitoring
- Metering
- Smart Grid (allocation)

**SMART Environment**
- Pollution detection
- Weather and environment sensing

**SMART Manufacturing**
- Next Gen RFID
- AI Robotics
- Automated factory

**SMART Health**
- Remote diagnosis
- Bio sensors and monitoring
- AI diagnostics

**SMART Applications**

- SMART Education
- SMART Infrastructure
- SMART Transport
- SMART Buildings
- SMART Energy
- SMART Environment
- SMART Manufacturing
- SMART Health
High-level strategy for “Internet Plus Energy” and Smart Energy, as an anti-pollution measure. “Electricity sales, construction investment, internet plus energy and smart energy in China is estimated at RMB 5 trillion.”

**Essence Securities**

National Energy Administration is working on building a unified and open system of technology standards. State Grid investing heavily in ‘Smart Grid’ including research on London Smart Grid project. GE (Smart Grid Demos); Intel (joint laboratory with China Smart Energy Union)

**Key Players**

State Grid, Wuqi Tech, Baosight (state owned software company, energy saving)  
IESLab (integrator for smart grid, water, energy saving, informationisation)  
Sungrow (repositioned from solar PV to energy storage, vehicle and charging)  
Wiscom (power plant automation, smart substation)  
NARI (Built e-commerce platform for power exchange in 2014)

**Opportunities**

Smart Grid, Energy saving consultation, new energy development, cloud platform build, remote meter and monitoring, and big data operation.
Communications Consultants Worldwide (Ccww) has licensed its NB-IoT protocol-stack software to WuQi Technologies.

Service: Integration of NB-IoT protocol-stack software onto WuQi Technologies’ SoC to enable the production of a highly integrated, very low power, NB-IoT SoC chipset targeting IoT Smart City, Smart Home, and wearable applications, and enable chip and module manufacturers to rapidly enter the market with smallfootprint, broadly-tested, stable SW for very low maintenance, 10 year battery-life applications.

WuQi is a privately funded silicon and software start-up with its headquarters in Chongqing. Miixed-signal system-on-a-chip solutions for the internet-of-things.

Highlights: “Good for China” Enabling a Chinese manufacturer to produce exportable products. Company based in West China.
Transport early to embrace ‘Smart’ concepts and many cities have started smart transportation projects. A series of smart city developers, including top-level designers, system integrators and solutions providers are capable of providing solutions for smart transportation projects in China. Internet for Vehicles (est. 80% of cars will be automated, world’s largest market) ...but Autonomous Vehicles still not legal (Robin Li Baidu example). Bike Sharing Apps are HUGE.

**Key Players**
- Electric Cars (BYD, FAW, Dongfeng, Geely, SAIC, BAIC...any many more)
- Car Sharing (Didi-Kuaidi Alibaba/Tencent also in Autonomous driving alongside Baidu)
- Bike Sharing (Ofo, Mobike)
- Autonomous Rail Transit (ART) tram system (CRRC/CSR)
- NavInfo (data, content and service for digital mapping, internet of vehicles)
- AutaNavi (digital map, navigation positioning)
- Hikvision (video camera, webcam, virtual video, image analysis)
- Dahua Technology (monitoring products and solutions. London Underground project)
- Seisys (system integrator for transportation systems; highways, tunnel, bridge management)

**Opportunities**
- Urban Management: Hangzhou, Yinchuan examples systems to ease transportation pressure including data centres, decision analysis, simulations and evaluation etc. driverless cars and associated tech, ‘Shared Transport’ bikes/cars (only supporting tech...not platform)
Routing and scheduling software to plan daily deliveries, monitor transport progress or evaluate operations against business KPIs. Flexible core planning system, and range of additional modules.

Key Highlights: Flexible solution allowing clients to modify for China market; Solid China preparation, long term perspective, investment in China operations. Opened China subsidiary with China based staff (key to data license), Early Chinese language capability in China and UK, Regular engagement and use of intermediaries.
Education reforms across China, challenges similar to e-health service provision (remoteness, corruption, bureaucracy, equal access). Vocational education is huge (MOOC, ICT Training). Curriculum provision and data management are restricted, but marketplace for support applications is open and high demand.

Key Players
New Oriental (private education), IflyTek (language processing and voice recognition) Huawei/ZTE (Smart City projects), Indian ICT training (Infosys, Aptech, NIIT) Private schools (looking for advantage, expand nationally (remote provision) Public Universities (research/investment/provision)

Opportunities
eRecords management, Library Management, digital schools, remote teaching and assessment, wearable devices, education apps. Video surveillance, access control, broadcasting, lighting equipment and control, air-conditioning/PM2.5/fire monitoring and control, projectors, remote power management devices, remote education, robotics/special needs provision, teacher training, curriculum development.
Educate is a provider of educational software. They have signed an agreement with China Future School Labs (CSFL) to provide teacher assessment software “Standards Tracker” to Chinese government schools. CFSL is part of the National Institute of Education Sciences, a research branch of China’s Ministry of Education.

Key Highlights: Adapted the software jointly with CFSL (A government linked entity) and invested IP into a new Joint Venture, close link to Government programme (education reform), Chinese entity will own, operate data.
Major Healthcare Reform. But major challenges associated with the reform are generating opportunities for smart solutions in E-records, hospital informatisation, remote medical treatment (e-healthcare), medicine e-commerce and wearable devices. Relatively open market for most sectors.

**Key Players**
- Chengmei Medical (medical care, elderly care)
- Biolight (wearable and portable medical equipment)
- Andon (blood pressure meters; and App for individuals to monitor their own health status)
- Alijk.com (Invested by Alibaba. Monitoring processes of medicine distribution and sales)
- WinningSoft (medical and health informatisation for hospitals and regions)
- Searainbow (medical payment and medical insurance platforms)
- Longmaster (e-health solutions and diagnostics)

**Opportunities**
- Wearable devices, e-commerce platforms, hospital informatisation and social healthcare insurance payment, electronic records, nationwide data sharing, intercommunication of cities and regions
TPP is a healthcare software company for single patient record applications improving access to clinical data. They have signed a Strategic Cooperation Agreement with Hainan-based company, First Chengmei Medical Industry Group to build an integrated healthcare platform for electronic health records. First Chengmei Medical Industry Group specialise in medical care, elderly care and financial/real estate investment.

Key highlights: Sought Government support (PM trade mission highlight, funding), localised software, invested time into finding right partner. Linked to Chinese programme ‘Healthy China 2030’, close link with local Government in Hainan.
Chapter 3: Drivers: Macro trends and New Generation ICT
Urbanisation
Urbanisation rate approaching 60%. Hukou reforms (urban residency to 100m internal migrants). Xiongan New Area. New Town Planning notice (2014-2020) to “increase effectiveness and lower costs” of new developments. (Smart Cities)

New Generation (Indigenous) Information Technology (MIC2025)
Intelligent devices, sensors, cameras, smart terminals, robots and IoT have been applied to water, weather, energy, environment, making everything ‘sensing’, connected and recorded. 5G platform will present huge opportunities (Huawei Surrey University 5G Testbed)

Mobile Adoption
China led the world on Mobile adoption and data use, and technology industries are already well adapted.

Consumer versus Business Technology...“Chinese business has been slow to embrace the internet. As it does, productivity should soar” (McKinsey Global Institute)
High cost of investment is a normal trend. Increasing concerns about cybersecurity and lack of senior commitment are more concerning.

Chinese market is slightly different...less concerns over privacy, less restrictive approach to cybersecurity, and willingness to experiment....higher risk for economy, but positive for IoT providers.
The Role of Government (G2G)

Important to work with Chinese Government, and encourage home Government to engage and...

- Increase their enabling role, support export (financing/standards/MOU frameworks, pilot projects), and alignment with global frameworks
- Collaborate with domestic and foreign cities to get a coherent vision of how Smart Cities should look, beneficial functions, standards (UK BSI?) EUSMEs can be a part of these international Pilot Programmes.
- Departments should align with agreed Government wide vision and invest appropriately
- City Governments can manage cooperation between Universities, businesses, investors, and citizens to implement joint overseas projects.

- If your projects align with this kind of Pilot Programme in China you will get support.
Case Study: Yinchuan

Wearable devices and 200RMB per year fee for Smart Health services.

Facial recognition for Smart Transport and residential compound Smart Security

RFID/SIM: Update gov when bins need emptying.

Department data sharing to reduce bureaucracy.

PPP Model: ZTE + Gov 300m RMB investment annually (50 years) (CLP Central Local Partnership?)
E-commerce giant Alibaba based in Hangzhou owns one of the largest datasets in the world “Golden Data” on Chinese consumers and retailers, credit data, preferences, financial information. They are now combining this with traffic information, social media data and CCTV video feeds from Hangzhou Gov to fuel the “City Brain” project.

Hangzhou trial is considered successful (but unlikely it would be found otherwise) and hoping to export to other cities.

Related to the national “Social Credit” programme across China where the Gov is hoping to produce the world's most comprehensive Citizen datasets and “Score” citizens based on their compliance.
British Standards Institute has Launched PAS 180 and 181 (2014 launch)

Developed in close partnership with industry

Guidance on developing a Smart Cities Strategy, data sharing,

Adopted by Huawei
New Generation ICT

ATIS Framework
Access Enablers (privacy and security, location, context aware, IoT) ▲

Platform Enablers (Analytics/AI, data integration and exchange, AR/VR platform) ►

Application Enablers (App marketplace, Content ecosystem) ▲

Infrastructure Enablers (Resilience (disaster), Asset Management) ▼

Whilst core technology is less advanced, and business adoption sub-optimal, China’s ability to implement consistently at scale, highly consolidated market, and fewer concerns over privacy are allowing progress….however regional competition is proving an obstacle, poor data sharing, bespoke incompatible solutions.
5G – Huawei is leading the world, China is very mobile focused (leapfrog), 5G Testbed with University of Surrey. ...but broadband investments also continue (ChinaMob, Unicom, China Telecom)

“China will dominate 5G thanks to its political ambition...the rise of Huawei...and speed of 4G adoption” “...there will be over 1Bn 5G users by 2023 with more than half based in China” CCS Insight

AI/Machine Learning – major investments from Baidu, Tencent, Alibaba and others. China has largest datasets in the world, data is plentiful on these platforms, and far fewer barriers (privacy/security) ... but core research is lacking. Global research sharing may slow down in new political environment.
3D Geolocation – Baidu mapping (IndoorAtlas acquisition 10m USD), Wanda/Baidu/Tencent (failed) malls project does show ambition

App Marketplaces – Tencent (Wechat) is becoming dominant, but also Alibaba, Baidu, Big telcos...and many others

“Big data” technology takeup in Government/business is still behind...but in consumer/citizen it is leading edge....with much more potential.
Alipay (payment service) = Book hospital appointments, pay traffic tickets, pay utility bills, pay other non-tax revenue.

Wechat = (Tencent + Chongqing/Zhuhai/Zhengzhou/Guangzhou and others) Application marketplace (including eGov/Smart City applications) book hospital appointments, apply passports, marriage registrations, utility payments, traffic info, medical results (CQ 1Bn USD investment to install 300,000 servers)
...this is all linked to wallets and social networking, personal identification, mobile phone services.

Huawei (Weifang) “narrowband IoT” agreement, highly integrated sensor rich environment.

China Unicom/Mobile/Telecom = Regional Smart City Platforms

ZTE = Yinchuan case study
Chapter 4: More case Studies
More Case Studies of SMEs in China

**Smart Energy/Environment**
CCWW (Smart Metering)
HYDRO Smart Water Monitoring, Filtering
Vito (Belgium) working with the Chinese government on Air and Water Quality monitoring assessments.
Modern Water

**Smart Transport**
Paragon (Logistics software)
INGENOR (Spain) Award for Eco-City Masterplan of Kunshan City
PLP Architecture
Space Syntax
Sure architecture (highly active networker)

**Technology & Applications**
Sondrel (IC design, based in Xi’an)
Micro Focus (Mainframe solutions)
Testplant (Automated software testing)

**Competition Finalists**
MODO System cloud file management
That Figures Hospital management software
ROVAR subsea forklift kit

**Smart Education**
Gaia (3D graphical learning tools)
Indigo Vision (CCTV, schools/airports)
Educate (teacher assessment software)

**Smart Healthcare**
Sinophi Healthcare (HK)
Superdragon TCM (ecigarette))
Phynova (Plant Chemistry/TCM)
Chapter 5: China Strategy
Market Presence: Entrepreneurship competitions

IPIEC Global 2017
MAKE YOUR STORY HAPPEN IN CHINA

2ND PRIZE
$50,000

CHAMPION
$100,000

3RD PRIZE
$20,000

Vote Now

Education: China International Educational IT Solutions Expo (Beijing)

Transport/Logistics: CILF - The 13th China (Shenzhen) International Logistics and Transportation Fair (Shenzhen)

Smart City: China Beijing International Smart Cities Expo (Beijing)

Health/Elderly Care: China (Beijing) International Elderly Service & Health Management Expo (Beijing)

Smart Energy: 7th World Congress of Smart energy (Wuxi)

Good Events = Local + National Government support; Financial support for International visitors; major Chinese companies. (...bigger not necessarily better)
Ten Point Plan for Finding Opportunities in China’s difficult ICT/Smart City Market

1. Find niche markets (Sponge City, Parking, IoT)
2. Be present in market
3. Partner with local industry leaders
4. IP & Due Diligence (Real Estate vs core technology)
5. Third markets cooperation
6. R&D projects (including training and tech transfer)
7. M&A Investment
8. Government SEI Strategic Emerging Industries and Programmes like BRI, MIC2025, Healthy China 2030
9. Chinese Giants supply chain (indigenous innovation)
10. Open IP environment (value in service)
Get Ready for China