

NB-IoT

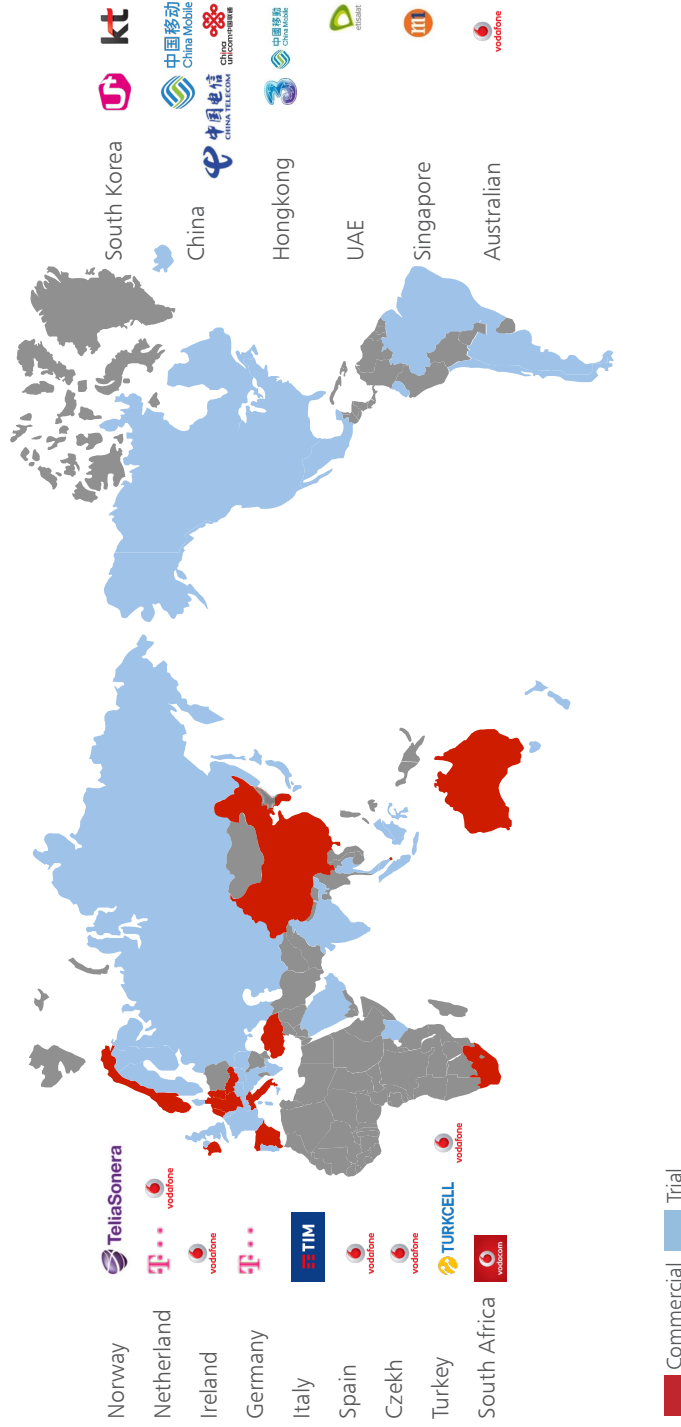
Commercial Premier Use Case Library

Issue 1.0



21 Commercial NB-IoT Networks by 2017.10

Will reach 30 by the end of 2017



Premier use case list

B2BB (Big Business)

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- Internet shared bicycle
- Smart white goods
- Smart logistics

B2SB (Small Business)

P10

- Connected cow or sheep
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- Smart lock

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- Smart gas metering
- Smart water metering
- Smart street lighting
- Smart electricity metering
- Smart parking

B2C (Consumer)

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- Smart tracking



Internet shared bicycle

SOLUTION INTRODUCTION:

Shared bicycle is very popular today. With NB-IoT embedded, you can easily use your phone to find an available bike nearby, pick it up, get where you're going, and leave it there for the next person. No docking stations, no walking the rest of the way.

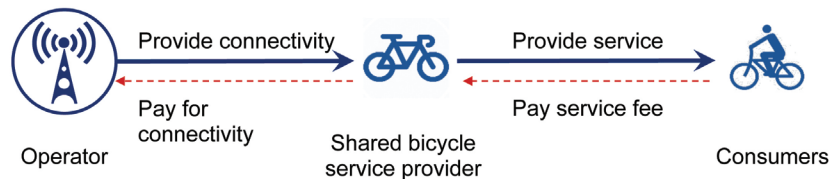
By using shared bicycle, people don't have to take car for short distance trips. It helps reduce the carbon emission, reduce the traffic, and save gasoline.



NB-IoT is used to provide connectivity between the bike lock and the application server, so that the lock can synchronize with the server various information such as the lock states, the bike's geography location and the password.

Compared to GSM technology which was the previous technology used for shared bicycle, NB-IoT has outstanding performance advantages in terms of coverage, capacity and power consumption. With NB-IoT, one battery can keep a bicycle connected for 2-3 years and there is no need for any external power supply facilities.

BUSINESS MODEL:



The business model for share bicycle is very simple. The mobile operator provides SIM cards to the service provider. The service provider pays the mobile operator for the NB-IoT connectivity, and offers ride services to consumers. Consumers pay the service provider for each ride.

Shared bicycle business model is easy to replicate, however it is suggested that mobile operator can help the bike sharing service provider to contact local government / public authorities to get their support.

PROPOSED PARTNER LIST:



1. MOBIKE

Mobike, founded and owned by Beijing Mobike Technology Co., Ltd., is a fully station-less bicycle-sharing system headquartered in Beijing, China. It is the world's largest bicycle operator, and in December 2016, made Shanghai the world's largest bike-share city.

In June 2017, Mobike raised \$600 million in Series E funding led by Tencent, bringing the firm's fund raising in 2017 alone to nearly US\$1 billion. In the same month, the company was valued at US\$3 billion.

Currently Mobike operates in over 160 cities in China and in 6 markets outside of China, which include but are not limited to Beijing, Shanghai, Guangzhou, Shenzhen, Chengdu, Ningbo, Xiamen, Foshan, Zhuhai, Changsha, Hefei, Shantou, Haikou, Deyang, Nanning, Guiyang, Xi'an, Wenzhou, Wuhan and Singapore, UK, Italy, Japan, Malaysia, USA.



2. OFO

Founded in 2014, ofo is the world's first bicycle-sharing platform. ofo first began its shared bicycle business in Peking University, then extended its service from campus to urban areas. Now it has 200 million users, its business covers 180 cities in 17 countries, including: China, Singapore, UK (London, Oxford, Cambridge), US (Seattle, Washington, Worcester), Kazakhstan (Astana), Malaysia (Malacca), Thailand (Bangkok, Phuket), Austria (Vienna), Japan (Tokyo, Osaka), Russia (Moscow), the Czech Republic (Prague), Italy (Milan), the Netherlands (Groningen, Rotterdam), Australia (Adelaide), Spain (Madrid), Portugal (Lisbon), Israel (Tel Aviv).

Smart white goods

SOLUTION INTRODUCTION:

The existing smart white goods use Wi-Fi and suffer from many drawbacks such as complex configurations, limited coverage, and poor mobility. The locations and status of white goods from factories to households cannot be monitored and unauthorized transshipment cannot be detected. Due to limited coverage of Wi-Fi, frequently disconnected white goods lead to low network access rate. Statistics show that the online availability of smart white goods drops to less than 5% after three years. Such situation negatively impacts the benefits of smart white goods.

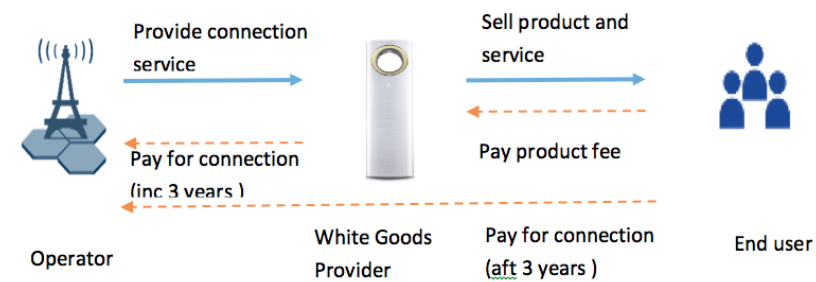


The NB-IoT-based Smart White Goods Solution is available upon network access and does not require configurations, bringing high online availability of equipped household appliances. Featuring inherent high mobility, the solution can prevent unauthorized cross-regional transshipment. Therefore, sellers cannot earn profits by setting different prices in different regions and bring economic losses to household appliance vendors.

The solution offers wide indoor coverage and high online availability to household appliances. It can remotely monitor the usage and status of white goods and help vendors offer predictive maintenance.

The solution can utilize the usage data of white goods for Big Data analysis, provide household appliance vendors with value-added services, and allow to explore new business opportunities.

BUSINESS MODEL:



The business model is traditional B2B2C. The mobile operators provide SIM cards to white goods providers, and white goods manufacturers produce the smart white goods and sell them to the end customers.

The white goods providers pay the first 3 years of communication data traffic fees to the operators when they sell these products. Three years later if the end customers still want to use the NB-IoT connectivity service then they can easily pay the data traffic fees via a smartphone application.

PROPOSED PARTNER LIST:

1. HAIER



Founded in 1984, the Haier Group is today the world’s leading brand of major household appliances and is now transforming from a traditional manufacturer to an open entrepreneurship platform. In the era of the Internet and post e-commerce, Haier will extend its ecosystem to social networks and community economies while enhancing the user value of Haier products and services and instilling integrity as a core competence throughout the Group. Haier aims to become a global leader in the era of the Internet of Things.



2. MIDEA

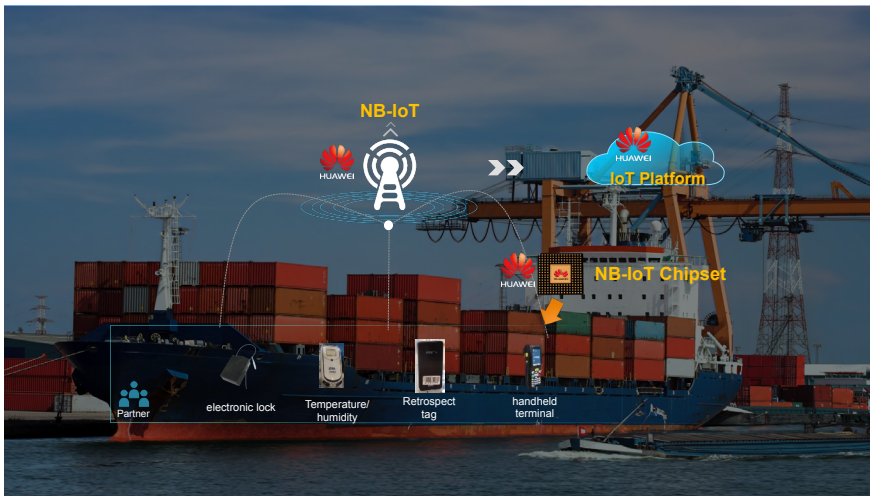
Midea Group is a Chinese electrical appliance manufacturer, headquartered in Guangdong. the firm employs approximately 100,000 people in China and overseas across 21 manufacturing plants and 260 logistics centers across 200 countries. It has been listed on the Fortune Global 500 since July 2016. Midea produces wide ranges of lighting, water appliances, floor care, small kitchen appliances, laundry, large cooking appliances, and refrigeration appliances. It also has a long history in producing home and commercial solutions in air conditioning and heating (HVAC). 7 billion euros.

Smart logistics

SOLUTION INTRODUCTION:

Currently, the logistics industry has the following issues and pain points:

- High-value goods are easily stolen, altered, or exchanged during transportation, and it is difficult to monitor goods in real time.
- The logistics enterprise and the cargo owner cannot obtain and monitor the location of the logistics vehicles.
- Without real-time monitoring of valuable goods, the logistics enterprise and the goods owner cannot detect any abnormal situations in time. They have to fix potential problems later, which implies high costs.
- The entire cold chain logistics lacks information transparency. It is hard to ensure food and drug quality.

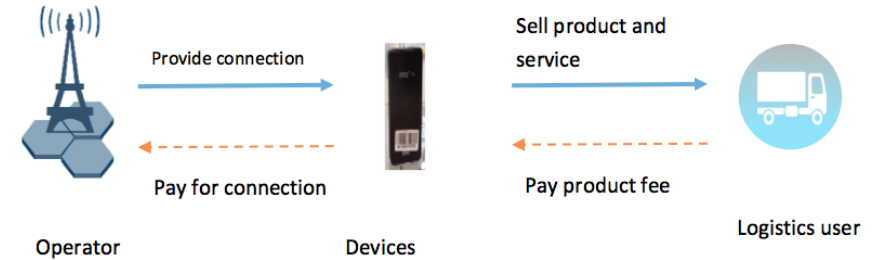


The solution uses the carrier network without requiring a gateway or a concentrator. NB-IoT based sensors can directly connect to the network, resulting in a simple network structure. It is consequently more convenient to install devices and data can be obtained more easily. Vendors and owners need to focus solely on their core services, without paying attention to network maintenance.

In addition, the NB-IoT sensors have low power consumption and are powered by batteries. Plug & play, without the need for wires, the sensors can monitor the entire logistics process in real time.

When working with GPS, the solution can provide positioning accuracy to the nearest 10 m, which meets the positioning requirements of logistics.

BUSINESS MODEL:



The business model for smart logistics is simple. The mobile operators sell SIM cards and NB-IoT network connectivity services to the logistics company, who provides (and eventually manufactures) the NB-IoT embedded smart logistics devices. The end-users usually are logistics companies and the fee includes both device and subsequent service.

PROPOSED PARTNER LIST:

1. DHL

Deutsche Post DHL Group is the world's leading mail and logistics companies. Deutsche Post DHL Group employs approximately 510,000 employees in over 220 countries and territories worldwide. In 2016, Deutsche Post DHL Group generated revenues of more than 57 billion euros.

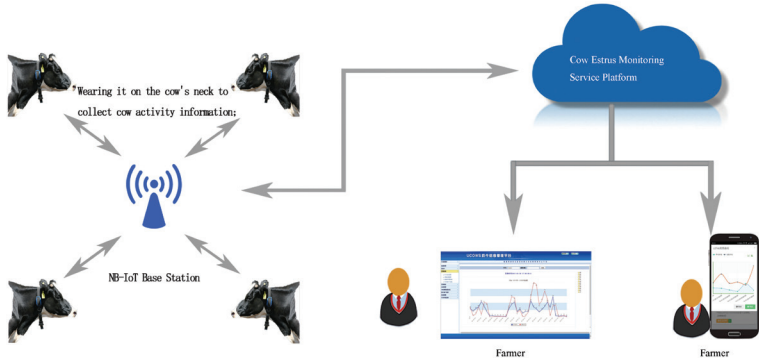


Connected cow

SOLUTION INTRODUCTION:

Cow Estrus Monitoring System uses a device installed on cow’s neck to collect & send cow’s activity data to the cloud platform. The software in the cloud processes the data and identifies cow’s estrus status in order to help the farmer get the proper semen deposition time, and to improve the yield of milk. Currently the estrus notification accuracy is above 95%.

Meanwhile, this system also provides basic information management to modern livestock industry, including farm management, cow management, real-time estrus monitoring, cow positioning and tracking. All this help farmer to improve the farm management efficiency and improve the yield of milk.

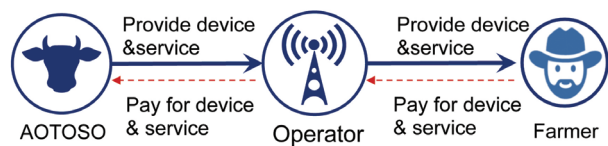


With mobile operator’s NB-IoT network, farmers do not need to deploy and maintain any communication network by themselves. The low power consumption feature enables cow monitoring device to work for more than 5 years with a battery of 5400mAH only.

BUSINESS MODEL:

The mobile operator can resell both the device and the service to farmers. In this case, the mobile operator sells the device and the cow information service together with IoT SIM card and communication service.

The mobile operator charges farmers for the devices and for yearly service fee, then pay back part of these revenues to the device vendor.



Example: China Telecom and AOTOSO business model

	1st year	2nd year	3rd year	4th year	5th year
Service	Device+ service + connection	Service + connection	Service + connection	Service + connection	Service + connection
User pays to MNO (RMB)	290	60	60	60	60
MNO pays to AOTOSO (RMB)	260	18	18	18	18
MNO revenue (RMB)	30	42	42	42	42

PROPOSED PARTNER LIST:



1. YINCHUAN AOTOSO INFORMATION TECHNOLOGY

Founded on November 16, 2009, Yinchuan Aotoso Information Technology Co., Ltd. has completed the shareholding reform in early 2014 through overall change and establishment of Yinchuan Aotoso Software Co., Ltd. It is a national high-tech enterprise specializing in research and development of intelligent identification and sensing technology, combined with the Internet of things, and the Internet +. It was listed on the national small and medium-sized enterprise share transfer system on July 14, 2014 (abbreviation of securities: Aotoso Share; stock code: 830860).

The intelligent identification and sensing technology is widely used in smart agriculture, smart city, in particular in precision breeding in animal husbandry. Aotoso Share has developed data collection solution, big data analysis and system solutions related to the core technology in the whole industry chain, to improve the animal welfare of China even the global animal husbandry. Products of the company have obvious advantages in technology and market in China. They are also comparable to international well-known enterprises in the same industry. The company also provides total solutions for a number of fields in intelligent city, such as safe city, smart traffic, school bus management, smart parking lot, entry and exit control, digital prisons, etc.

Connected sheep

SOLUTION INTRODUCTION:

SHIIP YOUR SHEEP

Shiip is a new, easy way of keeping track of your sheep herd. 1000 sheep are now equipped with Shiip in the region of Rogaland, Norway.

Sheep farmers needed a tracking system providing reliable two-way communication with long battery lifetime for a significantly lower device cost than existing tracking systems.

In cooperation with Telia Norway, Nortrace has developed a new tracking device based on NB-IoT. The solution improves animal welfare and makes it easier to reduce the loss of sheep because the farmer is notified if a sheep has not moved for a while. The farmer can then take action to release the stuck sheep. Furthermore the solution will help to rescue the sheep and less time will be spend to locate all the sheep.

The system has proved to work well and large-scale production of the trackers will start in early 2018. Some of the benefits of Shiip:

- 5–10 years battery of life
- Simple installation of the tracker on sheep
- Two-way communication
- Supports huge amount of devices



PROPOSED PARTNER LIST:



2. NORTRACE AS

Nortrace AS is a Norwegian company founded in 2014 and is located on Sandnes in Rogaland. Nortrace supplies equipment to the oil industry for the remote monitoring of fuel tanks. And Nortrace start to move to NB-IoT area for more cases including Smart metering, Smart cities, Smart buildings, Agricultural and environmental monitoring and Consumers. Shiip is Nortrace's first commercial product based on NB-IoT.

Smoke detector

SOLUTION INTRODUCTION:

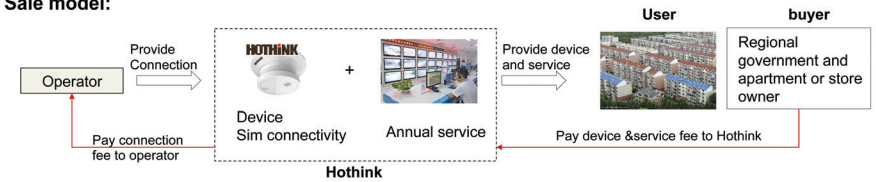
There are many old public spaces in the cities, such as old apartments, small restaurants, cafes, etc. These areas are the ones for which the government is the most concerned about, because the risk of fire is significantly higher than for other areas. But these places are usually too old and are hard to reach locations, so it is hard to use traditional smoke detector using cables.



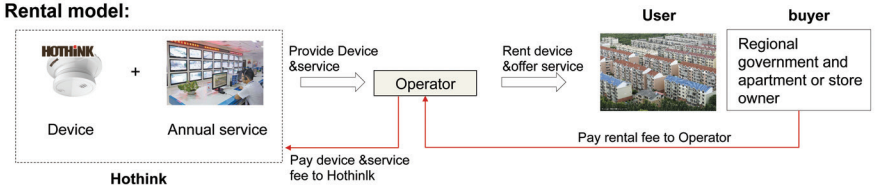
The NB-IoT smoke detector is easy to install (no need for cabling) and plug to play. It has very low power consumption. A battery with less than 3000mAh capacity supports 3~5 years of operations. Usually, buildings have some places such as basement and corners with bad network coverage. By using NB-IoT smoke detectors, there will be no blind area.

BUSINESS MODEL:

Sale model:



Rental model:



There are two different business models for the smoke detection’s use case.

1. For the sale model, the mobile operator provides SIM cards to the device company, and the device company produces the device and pays the connection fee to the mobile operator. The device company sells the smoke detector and service to the end customer who should pay the device and the service fee to the device vendor.
2. For the rental model, the mobile operator provides SIM cards to the device company, and the device company produces the device and sells it to the mobile operator, it also provides the service to the mobile operator. End customers will usually be regional governments and apartment or store owners, they only need to rent the smoke detectors from the mobile operators.

PROPOSED PARTNER LIST:



1. HOTHINK

Shanghai Hothink Intelligent Technology Co., Ltd. is a professional supplier dedicated to the provision of smart city public security solutions. The company has many years of R&D experience in firefighting informatization area. With integration of IoT, mobile Internet, big data and AR/VR new technologies, Hothink has developed a variety of smart city public security management solutions and applications with independent intellectual property rights.

Smart lock

SOLUTION INTRODUCTION:

Smart lock is becoming more and more popular those days. For short-rent apartment and hotel in particular, the traditional procedure consisting of booking a room, checking-in, accessing the room, returning the key and checking-out, is very inconvenient. With the new NB-IoT smart lock, the hotel could simplify the whole accommodation procedure. Customers only need to book a room (and get the password key sent to their phone) and then enjoy their accommodation. When the customer leaves the hotel, locks the door, uses its phone to check-out, and the password becomes invalid immediately. The whole accommodation becomes much easier than before and the overall customer experience is improved.



NB-IoT smart lock is easy to install. No need to worry about losing or forgetting to bring the key anymore. It's more convenient and safer. For the apartment owner or hotel manager, NB-IoT smart lock helps them to significantly reduce their maintenance costs.

BUSINESS MODEL:



The business model for smart lock is traditional B2B2C. Operators sell SIM cards and NB-IoT network connectivity to the lock company, who produces NB-IoT embedded smart lock devices. The end-users usually are small apartments or hotels, the fee includes both device and subsequent service.

PROPOSED PARTNER LIST:

1. ANXUNTONG

AnXunTong is a registered trademark of Beijing Hengzhitongchuang technology co., LTD. Since 2011, the company has been dedicated to the research and



development of the Internet of things (IoT) locks, and has developed the first electronic lock for the school apartment and the first NB-IoT electronic door lock in China. In order to promote NB-IoT, China Telecom has set up a IoT model project in Chinese universities -- Tsinghua, where all the locks are provided by AnXunTong. The company currently has hundreds IoT door lock users, with many users using more than 1,000 locks.



AnXunTong's main products include apartment locks, office locks and equipment cabinet locks, all of which support Zigbee or NB-IoT communication technologies.



Real-time door lock status monitoring interface



2. DESSMANN

DESSMANN (China) Machinery & Electronic CO., Ltd is the company which is specializing in the development and production of smart locks, safe box and application system. DESSMANN was introduced and settled with NetEase. The company is also one of the contributors to the China Electronic Lock Industry Standard and has been committed to promotion and development of the smart lock market in China.



2. XIAMEN HAASCLOUD TECHNOLOGY CO., LTD

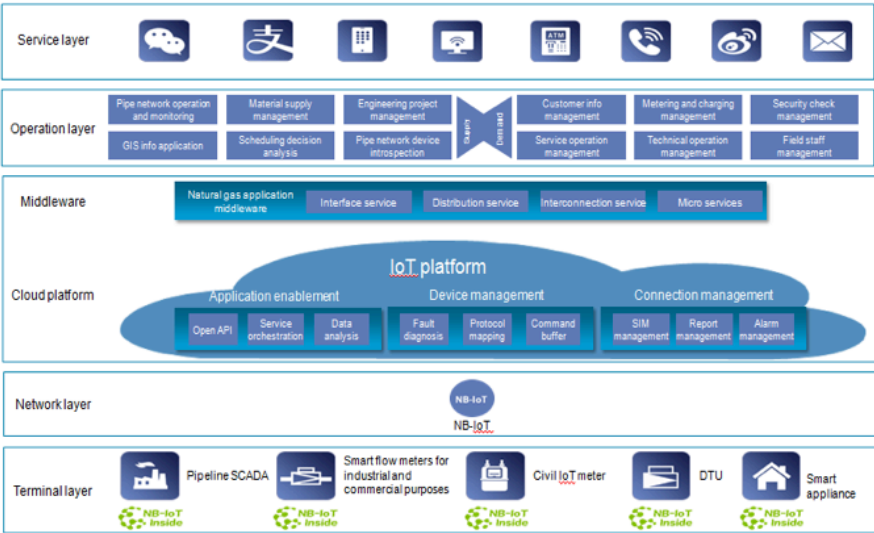
Xiamen Shared Cloud Technology Co., Ltd. is one of China's major online accommodation industry-leading service platform. By using the cloud and IoT technology, the company successfully reforming the apartment, home stay facility, hotel, and campus.

In the whole ecosystem, one end the company unites such as Ctrip, Qunar, Alibaba and Baidu hundreds of these OTA online travel distributors, using their content community and membership system flow, while the other end they expand the source of department which are able to be shared on internet, to make the query, booking, payment, check-in and check-out of the order automatically.

Smart gas metering

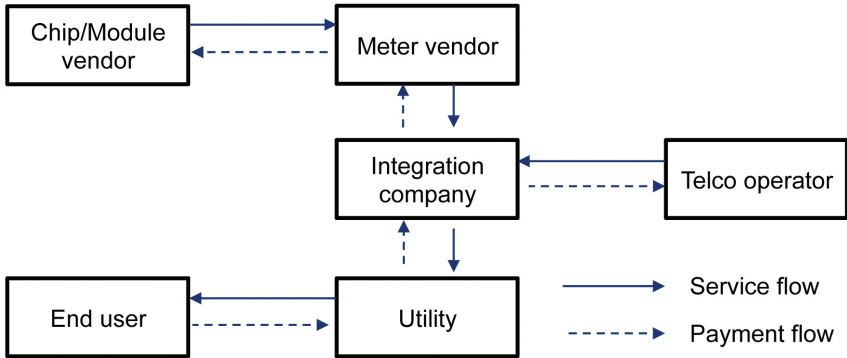
SOLUTION INTRODUCTION:

The smart gas metering solution is designed according to the structure of the terminal, pipe and cloud. Through the operator's NB-IoT network, the NB-IoT smart terminals upload the data collected by the sensors to the business management platform in order to support the business operation of the gas company. In addition, a large amount of data with cloud computing can provide more value-added services to the gas company.



BUSINESS MODEL:

- The main business model for smart gas metering is described hereafter:
1. The gas meter company acts as a contractor who provides the complete end-to-end smart gas solution: smart terminals (including communication connectivity charges for the whole life-cycle), data collection and business system platform, customer service platform.
 2. In smart gas solution, telecom operator will typically only provide SIM cards and charge for connectivity. Some telecom operators can also provide cloud services to utilities for application server hosting, or even provide device management service by IoT platform.



PROPOSED PARTNER LIST:

1. GOLDCARD



Founded in 1997, Goldcard High-tech Co.,Ltd is the largest smart gas total solution provider in China. It is the first listed company in the smart gas meter industry in China (stock code 300349). In addition to the booming business in the Chinese market, Goldcard also started cooperation with many leading companies in the UK, Germany, Colombia, Indonesia, etc.

2. INNOVER



Hangzhou Innover is a global pioneer in supplying cutting-edge smart metering technology and solution for worldwide gas & water customers. More than 10 million units are currently in use. In January 2017, Hangzhou Innover Technology's first NB-IoT gas meter has been tested live in Shanghai.

3. PIETRO FIORENTINI



Pietro Fiorentini was founded in Bologna, Italy in 1940. It is one of the biggest R&D and manufacture Groups for natural gas and no-corrosive gas reducing and metering equipment in the world. Seventeen solo or joint venture companies, and sales & service networks spread over more than 80 countries on five Continents. R&D Center is located in Vicenza, which is one of the most advanced R&D institutes of regulator technology over the world.

Smart water metering

SOLUTION INTRODUCTION:



With NB-IoT technology , the water company can more easily benefit from real time monitoring, data analysis and water consumption forecasting capabilities...

A NB-IoT module is used to transfer a rich set of information based on metering measurements to the management system of the local water

utility company . The information transmitted over the NB-IoT network includes (but is not limited to) the real time meter reading , accumulate measuring, reverse flow consumption, water temperature, pipe pressure, tempering alarm...

BUSINESS MODEL:

The business model for NB-IoT water metering is very flexible. Usually the water meter vendor can provide the full network solution to its global clients including various customized types of meters that can be equipped with NB-IoT modules according to the local wireless frequency requirements, as well as the provision of server hardware or cloud platform with advanced metering management system with billing functions. A water meter vendor can also supply solutions allowing to docking with the existing system from the customers by input/output data in common format.

In smart water metering solution, normally mobile operator only needs to provide SIM cards, and charges for connectivity. Some mobile operators can also provide cloud services to utility for application server hosting, or even provide device management service by IoT platform.

PROPOSED PARTNER LIST:

1. HUIZHONG



Huizhong Stock (300371) has always been committed to the development of ultrasonic measuring products so that it owns all the intellectual property rights of its products. Huizhong has been involved in the development of a number of national and industrial standards, always occupying the leading position in China. Huizhong developed China's first household ultrasonic heat meter and the first ultrasonic water meter which successfully broke the monopoly of foreign products. The product caliber ranges from 15mm to 15 m, has contained from

water/heat resource, DMA, large client settlement to residential measurement all series of products.

Huizhong is one of the leading R&D and manufacturing base companies in China specializing in Ultrasonic Heat Meters, Ultrasonic Water Meters, Ultrasonic Flowmeters, and Ultrasonic Metering Systems.



2. NWM

NWM was founded in 1958 as the first professional water meter factory in China and is now one of the biggest global water meter manufactures in world. The products are sold in more than 70 different countries and areas and enjoy significant market share in Italia, Spain, Portugal, U.K, U.S, Russia, Mexico, Columbia, Malaysia, Indonesia, and Israel...

NWM devote to establish strong and longtime strategic cooperation with the water utility companies and operators from all over the world. Our partner include CHINA TELECOM, CHINA MOBILE, CHINA UNICOM, VODAFONE Group, ORANGE (Spain), AT&T (U.S), TELSTRA (AUSTRALIA)...



3. SANCHUAN WISDOM TECHNOLOGY

Sanchuan Wisdom Technology Co., Ltd. was established in 1971, and is the first listed company that gives business priority to water metering in the Chinese market.

The Company is a State high-tech enterprise and State technology innovation model enterprise. It establishes a Postdoctoral Programme Research Station and Academician Working Station, and it is the only State Accredited Enterprise Technical Center in the industry. The company currently owns a total of 108 core patents, 13 invention patents and 108 copyrights in computer software. Meanwhile, the company participated in the drafting, ratification and revision of 13 state or industry standards, which means the company plays a leading and promoter role for the industry technological development and products innovation.

Sanchuan products has covered China mainland and 30 oversea countries in Southeast Asia, America, and Africa.



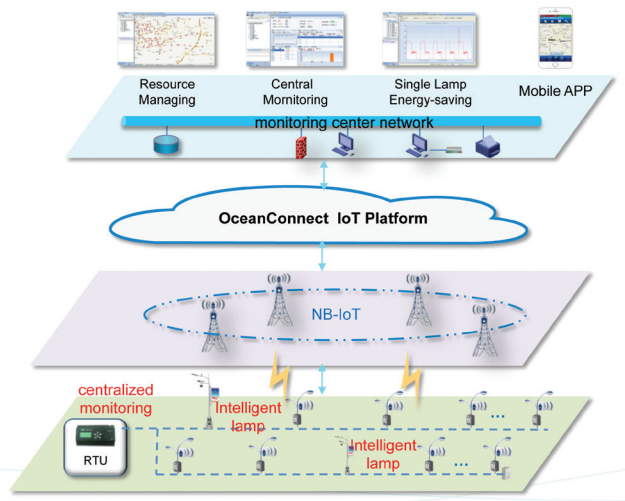
4. SUNTRONT

Suntront Tech is the leader of smart meter and smart energy industry in China. Products include smart water meter, smart gas meter, smart heat meter and smart water platform, smart agriculture water saving, smart heating, etc. Suntront Tech was listed on the Growth Enterprise Market (stock code: 300259), which is the electronic information industry benchmarking enterprise in China. Suntront Tech provides products and smart meter solutions for more than 600 water companies, more than 300 gas companies, and more than 100 heating companies. Suntront Tech is the No. 1 water meter supplier and the No. 3 gas meter supplier in China.

Smart street lighting

SOLUTION INTRODUCTION:

Smart Street Lighting is one of the most important use cases for smart cities. The traditional smart street light solution suffers several challenges: network instability, and multi-hop network operation. The smart Street Lighting solution based on NB-IoT technology is composed of street lamp monitoring terminal equipment, NB-IoT network connectivity, IoT management platform and operation management cloud platform. The network structure is clear. The application protocol is simple. And it does not require any gateways greatly improving both the stability and the reliability of the system. At the same time, it can bring down operation costs by approximately 50% while allowing the control and status monitoring of each individual lamp, which makes the energy-saving configuration simpler and much more flexible.



BUSINESS MODEL:

The business model value chain of smart street lighting involves the lighting device and service providers, carriers and governments. A carrier not only can sell the SIM card and the network connectivity service to the lighting equipment supplier, but can also actively participate in EMC (Energy Management Contract) or PPP (Public-Private-Partnership) types of agreements for additional benefit sharing.

Smart Street Lighting projects generally have the following typical business models.

1. INVESTMENT FROM THE GOVERNMENT OR PUBLIC LOCAL AUTHORITIES

Smart street lighting projects are funded by the government or local public authorities. Based on the field experience gathered through several large-scale projects, single-lamp control mode allows energy savings greater than 30%. In this case, it will take only 3 to 4 years to recover the whole investment.

2. EMC (ENERGY MANAGEMENT CONTRACT)

A smart street lighting company invests in the construction of the street lighting system, and provides system operation and maintenance services. Once the system is installed, the time required for ROI will depend on the scale of investment and the energy saving efficiency of the whole project. After the EMC cooperation phase, the city lighting management department will get the full ownership of all the hardware and software products of the smart lighting system, and will enjoy the huge benefits of Smart Street lighting every year.

The EMC model can efficiently alleviate the pressure for government funds, while ensuring the quality of project construction and long-term operation and maintenance services, reducing project risk, and promoting the rapid development of city street lighting.

3. PPP (PUBLIC-PRIVATE-PARTNERSHIP)

Government / Public authorities and private company(ies) set up a joint venture company that will be responsible for the urban smart street lighting system construction and the associated project operation. The government will provide a reasonable investment return and pay for operating expenses to private company. For the inadequate part, the government's financial funds will be subsidized.

After the expiration of the cooperation, facilities and assets of the project company will be handed over to the Government free of charge.

PROPOSED PARTNER LIST:

1. AOD



Located in Weifang's high-technology development zone, in the Shandong Province, AOD Co., Ltd. is committed to become the best smart city solution provider. In the field of smart street lighting, AOD is the inventor of the "first LED street light", the constructor of the "first LED road", the founder of the "first LED city". AOD has a huge practical experience in the field of LED street lighting. With significant research and development activities and strong promotion of smart street lighting, AOD is focused on the rapid development of the smart street lighting industry.

2. PHILIPS



Phillips is one of the world's largest lighting companies, has a history of 127 years with business activities in over 60 countries. Phillips also is one of world leading companies in the LED domain.

3. TELCHINA



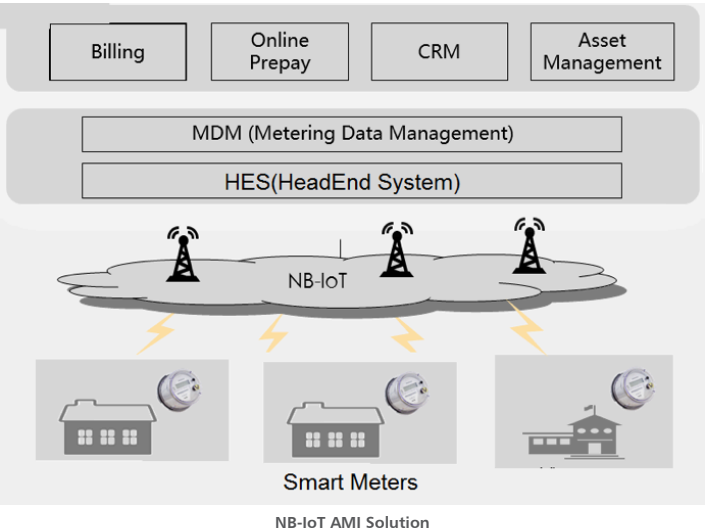
Telchina has been focusing on smart street lighting for 15 years. With advanced technology and products, Telchina contributed to hundreds of deployments in China. It also recognized as the supplier of the most successful cases in China in terms of city-level energy saving efficiency.

Smart electricity metering

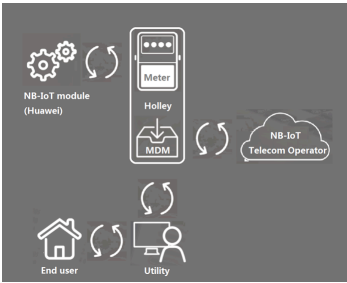
SOLUTION INTRODUCTION:

NB-IoT based smart electricity meter provides utilities with the world’s most reliable communications system. By using the NB-IoT smart meters, utilities can get energy consumption data directly, and can also support various values per hour, and handle a range of energy events and statistics.

Compared to previously used GSM technology for smart meters, NB-IoT has outstanding performance in terms of coverage, capacity and power consumption. NB-IoT is a low power wide area (LPWA) wireless access technology, which offers a wide range of advantages, including a battery life of up to 10 years, a coverage gain of 20dB over conventional GSM networks and support up to 50,000 connections per cell.

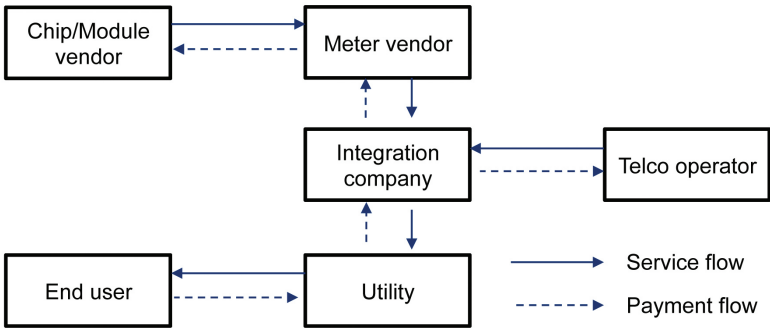


BUSINESS MODEL:



The business model for NB-IoT is very simple. NB-IoT module supplier will provide NB-IoT modules to metering manufacturers. Meter vendors can provide not only meters but also the complete AMI solution including MDM/HES system, via the NB-IoT communication network from telecom companies, the smart meters’ data will be received by the utilities data center. Utilities will then send accurate bills to end users.

In the smart electricity metering solution, normally mobile operator only needs to provide SIM cards, and charges for connectivity. Some mobile operators can provide cloud services to utility for application server hosting.



PROPOSED PARTNER LIST:



1. HOLLEY TECHNOLOGY LTD

Holley Technology Ltd is a smart energy and smart grid solution provider, which is focusing on R&D, manufacture and sales of smart energy devices and systems. With 47 years’ experience in metering products, Holley Technology is one of the biggest metering manufacturers in China and annual production capacity reaches 25 million meters. Holley technology provides a wide range of products from electricity meters, gas meters, water meters and integrated AMI systems.

In 2017, Holley had deployed the first successful NB IoT Electricity Smart Meter project with partner Huawei in State Grid Tianjin Electric Power Company. In this case, the meter data reading frequency was 15 minutes interval, success reading rate was 99% and the maximum distance for meters reading was up to 10Km.

Holley products are available worldwide through offices in area of European, South America, Africa, South East Asia etc. For more information, visit <http://en.holleytech.cn/>



2. JANZ

Janz CE is a company focusing on R&D, manufacture and marketing of energy meters. Janz CE portfolio includes Metering, Communications and IT Systems that aim to deliver and anticipate Utility’s needs on Smart-Grid and Smart-City in several industries.

In Electrical Energy, Janz offers solutions that covers Africa, Asia and Latin America needs from electricity production to end-customer, through Public Light, Distributed Generation, Electrical Vehicles and other applications.

Smart parking

SOLUTION INTRODUCTION:

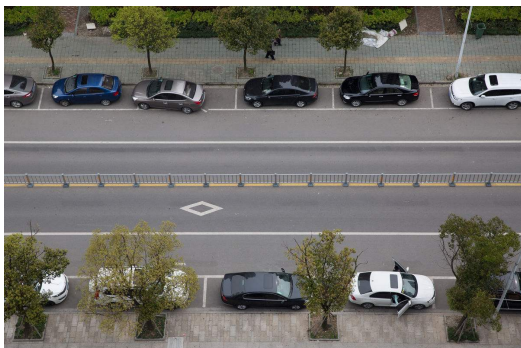
The aims of road side parking solution are to charge for the usage of parking space, make it easier for drivers to find available parking spaces, and to relief the traffic congestion.

The traditional way to charge for parking is to install parking meters on the road side for self-payment. The equipment and supervision costs are high, and the occupancy status cannot be monitored in real time.

NB-IoT smart parking solution uses magnetic parking sensors to detect the availability of parking spaces, and uses NB-IoT network to synchronize parking lot's status with the application server. That obviously decreases the labor cost and increases the turnover of parking resource.

Meanwhile, drivers can search for available parking bays and navigate to the parking lots via an App. This allows drivers to save time for parking and simultaneously reduces the traffic congestion and air pollution.

Due to the low power consumption feature of NB-IoT, the battery lifespan of magnetic parking sensors can be extended to 4 years.



BUSINESS MODEL:

smart parking business models:

1. Parking operators themselves purchase the parking sensors and NB-IoT SIM cards from mobile operators (e.g. China Mobile, T-Mobile, Vodafone etc.) and pay for the network fee accordingly. Drivers pay the parking company for the parking duration.
2. Parking operators rent the parking sensors and NB-IoT SIM cards and network connectivity from mobile operators. Then they pay for rental and related service. Drivers pay the parking company for the parking duration.

PROPOSED PARTNER LIST:



1. FANGLE

Fangle was established in 2010 and is located in Nanshan High-tech Park, Shenzhen. Fangle has always been focusing on the development and sale of smart parking devices and parking management system as well as parking business operations in some cities.

For the time being, Fangle implemented smart parking projects in over 10 Chinese cities and in nearly 10 countries in overseas market.

- China: Shanghai, Beijing, Kuming, Yuhuan, Ganzhou, Baotou, Yinchuan, Chongqing, Shantou, Guiyang, Wuxi etc.
- Overseas: Brazil (Andradina, Catalao, Atibaia, Rio Verde, Sao Vicente, Dourados), UAE (Dubai, Abu Dhabi), Germany (Bonn), Canada (Toronto), UK (London) etc.



2. INNOTEK

Zhejiang InnoTek Co., Ltd. is a high-tech innovation and business development enterprise whose founders have studied abroad and returned from the Silicon Valley of the United States, and the Company is a key project introduced by the Organization Department of Zhejiang Provincial Party Committee and the Future Sci-Tech Park. InnoTek has attracted attention from leaders of the Provincial and Municipal Governments, even the State leaders. In addition, Doctor Myron Scholes, a Nobel Economics Prize winner, has offered the angel investment to InnoTek.

InnoTek has carried out business in more than 50 cities in China. Up to end of June 2016, InnoTek has developed business in such important cities as Beijing, Shenzhen, Shanghai, Tianjin, Chongqing, Guangzhou, Wuhan, Chengdu, Hangzhou and so on. Innotek owns more than 60% of the share of road parking market in China and has consequently taken an absolutely leading position.

Smart tracking

SOLUTION INTRODUCTION:

Trackers, such as kid trackers, elderly trackers, pet trackers, etc, can be used everywhere. Trackers can provide localization and health status monitoring information. With NB-IoT embedded, the information collected by trackers can be transferred to the management platform even when the tracker is located in a weak cellular coverage area. And thanks to the low power consumption of NB-IoT chipsets, the battery for NB-IoT trackers can last a few times longer than for GPRS trackers.



BUSINESS MODEL:

The business model for trackers and wearable devices is very simple. The mobile operator provides SIM cards to the device provider or to the end user customer. The tracker vendor company provides the devices, or application Server and Web portal/APP for Mobile phone.

Trackers and wearable business are both replicable. Operators can also choose the tracker vendor company as their device and application server provider.

PROPOSED PARTNER LIST:

1. OVIPHONE

Oviphone was founded in 2008 and is a member of GTI and CMCC 5G Innovation Center. Oviphone has been focusing on wearable devices and trackers for more than 5 years and provides the design service and manufacture for wearable devices (smart watch/band) and trackers.

Oviphone is leading the NB-IoT application in the wearable and tracker sector; as demonstrated by the realisation of the world first NB-IoT tracker, and further innovations such as the NB-IoT watch with more features.



60+ NB-IoT Forum Members



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