台灣物聯網協會
Taiwan Internet Of Things Alliance

IoT Solutions as Building Blocks of Smart Cities

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(TIOTA)
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@ICITI

何明豐博士 個人簡歷

何明豐　國際專案管理師(PMP),TRIZ創新師

學歷:

清華大學
　科技管理研究所 博士 (輔修：生物科技管理學程、計量財務學程)
交通大學
　科技法律研究所法學碩士、資訊管理研究所(輔所)
交通大學
　電子物理系

主要經歷: （現任）

- 財團法人資訊工業策進會國際處 印度智慧城市專案顧問
- Apex Council Member of Action Centre for Smart and Broadband Bharat (ACSBB) under Indian Cellular Association (ICA)
- 育達科技大學兼任助理教授（物聯網、電子商務、全球運籌管理）
- 台灣物聯網聯盟 副秘書長
- 致理科技大學、育達科技大學協同教學業師（Industry Professor）
- 中國首鋼(首都鋼鐵)、香港長江集團旗下 卓越光掩膜科技公司
  副總經理暨資訊長
- 盟圖科技
  資訊暨圖形處理暨智慧財產權處 副處長
- 台灣積體電路公司
  電子束作業處 光罩圖形處理課副理、光罩廠自動化課副理

Dr. Michael Ho Profile

Current Roles:

III Project Consultant (India-Taiwan Smart Cities)

Deputy Secretary-general (Taiwan Internet of Things Alliance, TIOTA)

Educational background:

Bachelor: National Chiao Tung University Electro-physics Department

Master: National Chiao Tung University Institute of Technology Law

Secondary: MBA in Information Technology

Ph. D. : National Tsing Hua University Institute of Technology Management

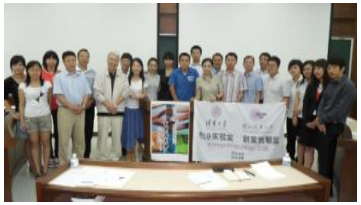
Secondary: Biotechnology management program

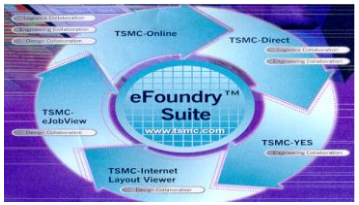
Quantitative Finance Program

Professionals:

Project Management Professional (PMP)

TRIZ L1





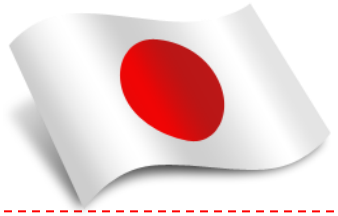
Project Management Experience:

1. Taiwan Semiconductor Manufacturing Company (tsmc, the world's largest dedicated independent semiconductor foundry, worldwide market share over 50%)e-jobview system project leader. E-jobview is one of the five tsmc B-B e-service projects make tsmc the No.1 of wafer foundry.
2. Intel Plaque award for a special, outstanding tailor-made e-service system solution.
3. tsmc 0.13 um “Multi-Mountains Project” sub-project, Da-Wu Project, mask project leader
4. Project leader of first Cross-strait Tsing Hua Universities (top-tier Universities in both Taiwan and China)
   Entrepreneurship Lab. The project solution is the Digital Signage Solution for Enterprises.

IoT Forecast

The Internet of Things, or IoT, is emerging as the third technology mega-trend **after computers and internet.**

2008 IBM proposed to USA government building a " Smarter Planet" Strategy.



2009 Japan initiated "i-Japan" strategy.

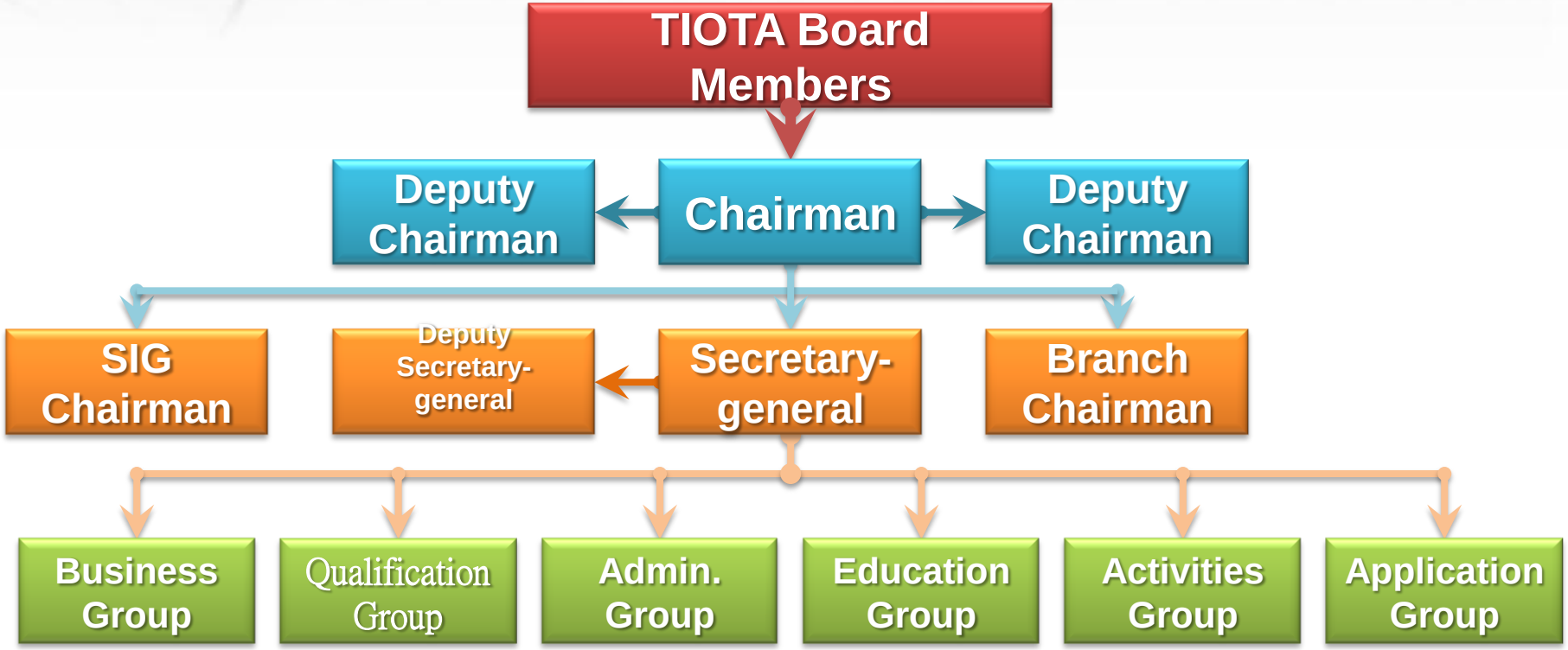
2009 Wen Jiabao initiated "Sensing China" strategy.

2010 IoT listed as focus industry in China's 12th Five-Year Plan (2011-2015)

2011 IoT market forecast in China will have 30% annual growth rate.

2020 Over 1 billion connected IoT devices

Taiwan Internet of Things Alliance Organization



Since 2011

Special Interest Groups (SIG) Operation Model

◆Business Opportunities
◆Proposal for Activities

◆New Members
◆New Solutions

Rights

Duties

Opportunity

Platform

Projects

TIOTA

Resources

Terms

Benefits

◆TIOTA Activities
◆Solutions Kits

◆Business Development

Core Competence

SIG Committee

Application | Technology | Business Model | R&D

Integration

Participation

Members

◆Conference
◆Activities
◆Partnership
◆Solution Kits

◆Marketing
◆Networking
◆Technology Roadmap

- Smart Farming
- Smart Grids
- Green Energy
- Smart Building
- Smart Sensors
- Smart Home
- Smart Parks

- Smart Transportation
- Smart Logistics
- Environment Monitoring
- Smart Fabs
- Smart Tourism
- Health Care
- Smart Cities

IOT Solutions Overview

3-Ring Strategies for Taiwan’s Smart Cities

- **IoT Modules Strategy：**
  - IoT modules as components/building blocks of smart cities
- **Tailor-made Smart Cities Strategy：**
  - Put IoT modules into tailor-made combination for different smart cities in Taiwan
- **Internationalized Strategy：**
  - Export different combination of smart cities to emerging markets

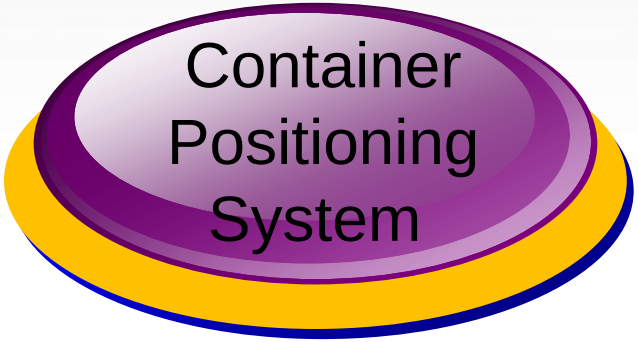
Source：Dr. Michael Ho(2017) https://iace.org.tw/f2/rdFocus/showDetail?id=101&searchCondition.category=%E5%9C%8B%E9%9A%9B%E5%89%8D%E7%9E%BB%E8%B6%A8%E5%8B%A2&searchCondition.pageIndex=0&searchCondition.pageSize=20

Smart IoT Modules

- Container Code Recognition
- License Plate Recognition
- Smart Parking Lot
- Smart Airports Applications
- Smart Tunnels Applications
- Smart Communities
- Smart Teaching Platform
- Smart Buildings
- Smart Homes
- Smart Banks Applications
- Smart Prisons Applications

Container Code Recognition System

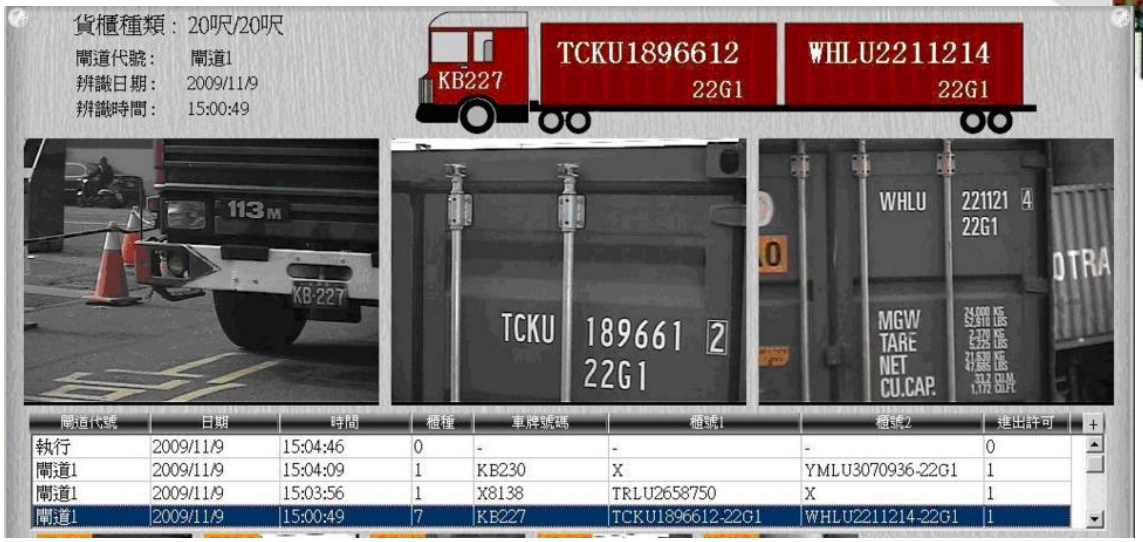
Why Container Positioning System?



Accurately understand and control the quantity/ type/ location of vacant containers.

Prevent human negligence, for example wrong writing record or typo from operators.

Container Code Recognition System



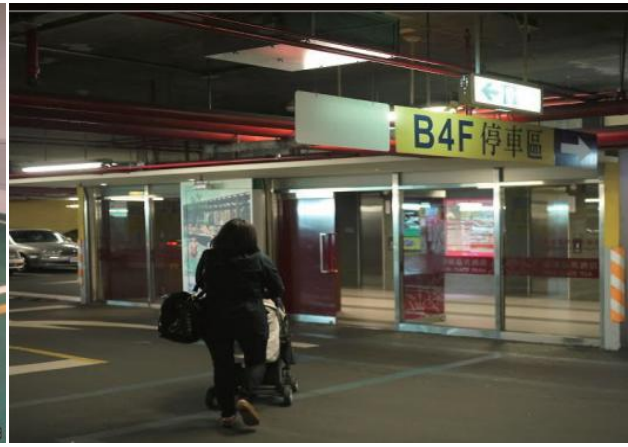
閘道代號	日期	時間	種種	車牌號碼	櫃號1	櫃號2	進出許可
執行	2009/11/9	15:04:46	0	-	-	-	0
閘道1	2009/11/9	15:04:09	1	KB230	X	YMLU3070936-22G1	1
閘道1	2009/11/9	15:03:56	1	X8138	TRLU2658750	X	1
閘道1	2009/11/9	15:00:49	7	KB227	TCKU1896612-22G1	WHLU2211214-22G1	1

License Plate Recognition

- **Benefits**
  - Highest accuracy rate in the industry
  - Reduced operational costs
  - Improved parking services
  - Easy to set up and use with intuitive system
  - License plate capturing when the car is moving
  - Purposely built for police patrols
  - Enhanced security level in monitoring areas

Smart Parking Lot

Illegal parking or unidentified objects left behind should be detected immediately.



With license plate recognition, personalized services can be provided:
Parking spot guidance
Parking in a wrong spot
Theft/break-in detection

Smart Airports Applications

Facial recognition in real time as people are passing by important control points, such as customs and on sky bridges, to detect blacklisted suspects.

Count the number of people who use the bathroom. When a certain number is reached, the system notifies the cleaning staff to clean the bathroom.

Birds often inhabit the vegetation near airport runways, which can cause serious flight safety issues if the birds collide with the planes. Intelligent video sensors can be used to activate devices to ward off birds if they are detected near airport runways.

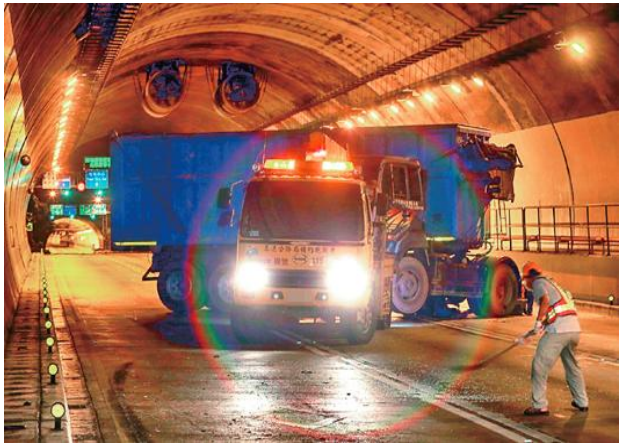
Airport tarmacs and runways typically require large perimeter monitoring to prevent intrusion by people and animals.

Smart Tunnels Applications

When objects fall onto the pavement.

When a car is on fire, or when there is unidentified smoke or flames.

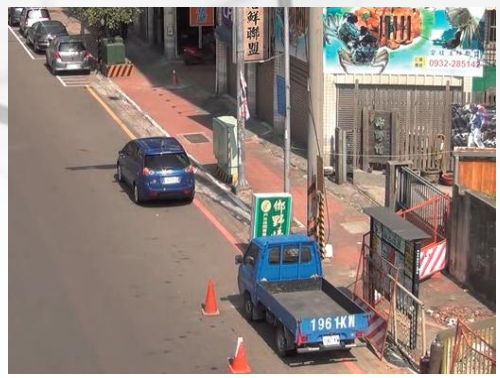
When people walk on the sidewalk or on the road.



When accidents occur, cars remain stationary for no reason.

When license plate recognition to detect any lane change.
When traffic suddenly slows down.

Smart Communities Applications



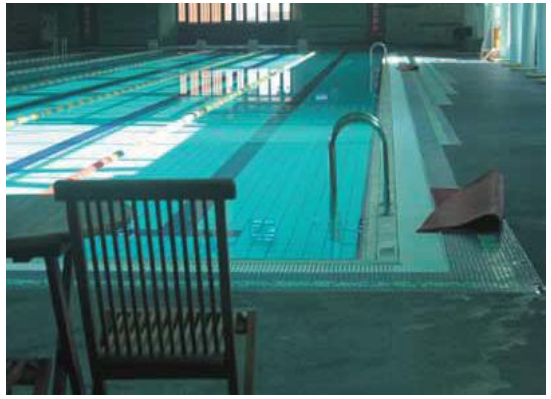
When a car is parked in a place that doesn't allow parking

When someone is wandering around in the roof.

When someone climbs over the community's balcony or walls.

When important items are taken away arbitrarily.

Fire and smoke detection.



When objects have fallen into the pool, or people are near the pool outside of usage times.

Smart Teaching Platform

our kit

- Each set per class includes the items shown as below (30-student-set as an example)
  - 30 e-pens and e-pads for students; extra 1 e-pen and e-pad for teacher
  - 1 User Manual
  - 1 USB Dongle

StandAlone Version

Cloud-based Version

2 Versions

Software + Interactive Tool

Smart Teaching Platform (Cont'd)

Innovation

Patented Tool

1 e-Pad & e-Pen

Dictionary Mode

1,000 most common vocabulary words

Arabic Version

Optical Mark Recognition

- Interactive
- Instance Response
- Self-Learning

ODM & OEM

2 Multiple Languages

Localization in different regions

- Durable
- Childlike Style
- Graphic-based
- Intuitive Operation
- Multiple Languages

Stand Alone

- ✓ Offline operable
- ✓ Patented e-pens & e-pad
- ✓ Durable & portable tools
- ✓ Simple interaction method
- ✓ Easily switch coursewares

Smart Teaching Platform (Cont'd)

Innovation

Software

2 End-to-end Cloud-Based System

Sharing

Customizable course preparation editor

Portable

iPad + Basic Equipment

Management

Course managing system

Cloud-based

Before Class

Auto Sync

In Class

Interactive

After Class

Tracking

Parental APP

- ✓ Wifi required
- ✓ Patented e-pens & e-pad
- ✓ iPad-based system
- ✓ Parental APP
- ✓ Various interaction methods

Quickly access students' learning progress

Instant Feedback

Voting

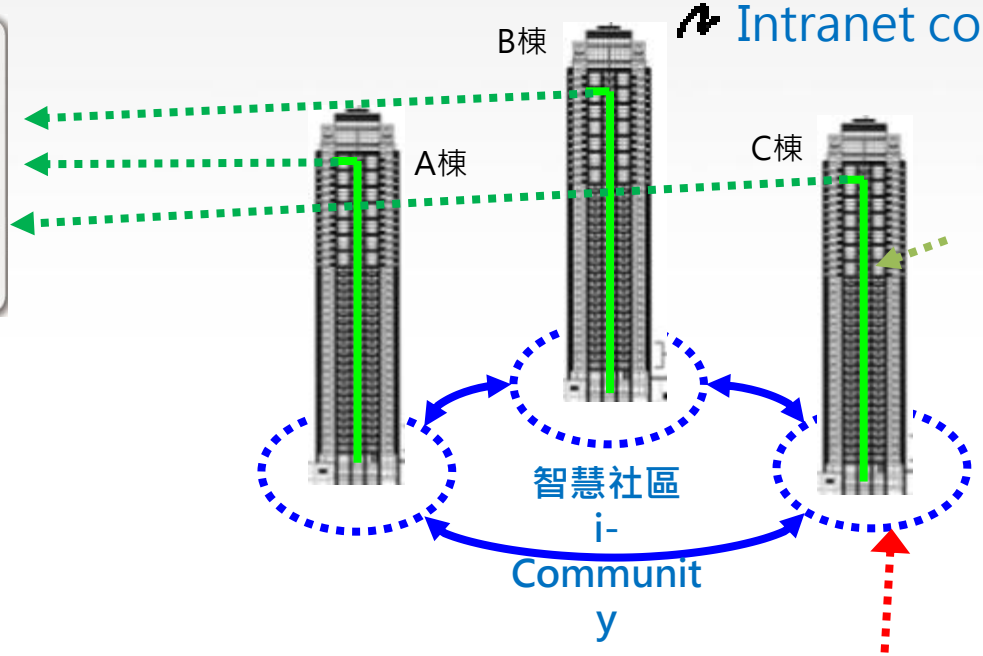
Racing

Instant Projection

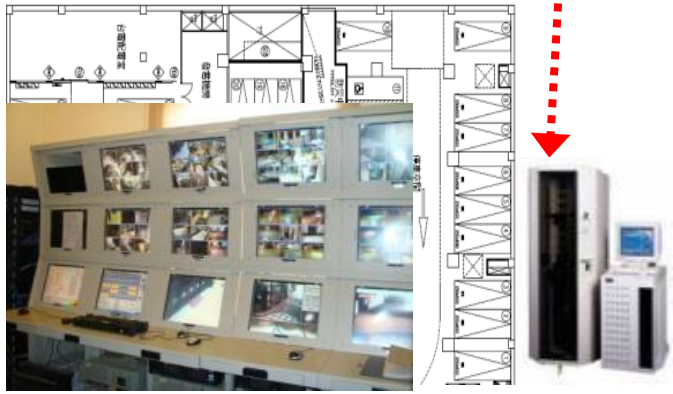
Smart Building System

Home Tablet

Intranet connection



Community security office



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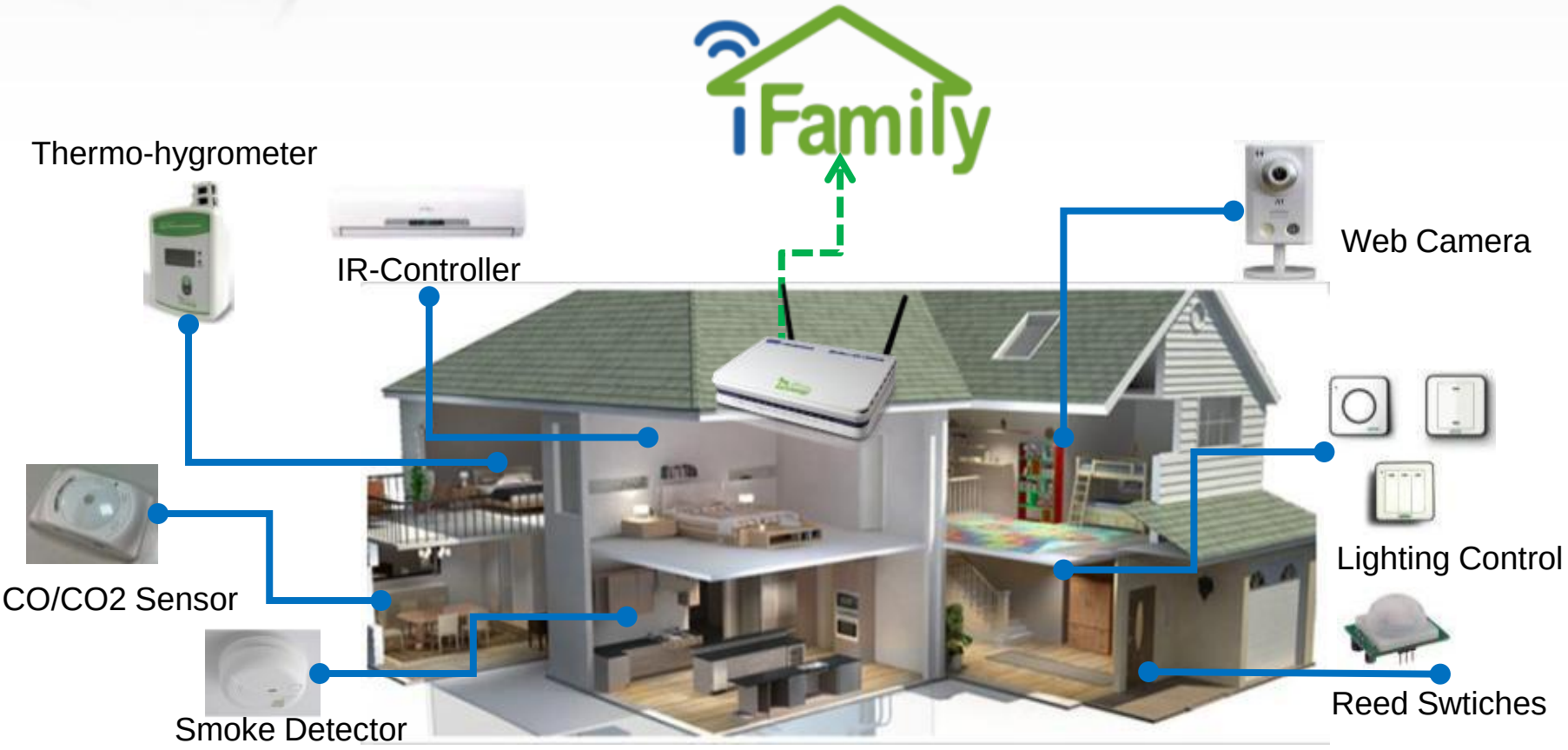
Smart Homes

- Interaction through remote access, scheduling, abnormal detection to reduce energy bill, increase comfort and safety.



Smart Banks Applications

Detection of masks: Detects suspicious people wearing masks or helmets in the corridors or at the entrances and exits.

Face detection: when a person enters a vault or other concealed place, the person's face must be captured from the front.

Detect the number of people: when entering vaults, make sure people enter in pairs and not singles. Also detect if someone has been taken hostage (two people too close to each other).

The ATM area is open to the publis and must be able to detect when suspicious people are withdrawing money or stealing money, when homeless people are residing in the area, or when suspicious objects have been left behind.

Smart Prisons Applications

A facial recognition database of all staff and inmates can be created beforehand for face capture or identification.

Hanging is the most used means of suicide in prisons. Objects moving beyond normal heights or inmates getting up after bedtime are detected.

Prisons are prone to fighting and bullying. Serious injury or riots could occur if these situations are not addressed immediately. Intelligent video analysis technology can warn guards immediately once intense action is detected for further investigation.

Prisons and their surrounding areas must be monitored closely 24 hours a day to prevent prisoners from escaping and to monitor suspicious people wandering about the perimeter.

Smart Cities in the World

- As the rate of change accelerates around the world, the economic and political importance of cities is growing quickly. Today, the majority of the world' s people live in cities, and it is becoming increasingly obvious that cities hold a major key to solving the social, environmental and economic challenges that they face.
- Many cities also have the opportunity to leapfrog others by avoiding expensive and increasingly obsolete physical infrastructure and instead moving straight to innovative applications using advanced ICT technology.

High Penetration of Taiwan Smart Cities


Taichung
(2013)


Taipei (2006)

Intelligent Community of the Year

11 cities out of all 20 cities in Taiwan are recognized as International Smart Cities by ICF.


Hsinchu
(2014)


New Taipei
(2014)


Taichung
(2013,2012)


Taoyuan (2013)


Taipei (2006,2004)

TOP Intelligent Communities of the Year

(2016)Chiayi (New), Keelung (New), Tainan (New), Taoyuan, Yilan (New)
(2015)Changhua (New), Taitung (New), New Taipei, Taoyuan
(2014)Hsinchu, New Taipei , Taoyuan
(2013)Hsinchu, Taichung , Taoyuan
(2012)Taichung, New Taipei
(2009-11)Taoyuan
(2006)Taipei
(2004)Taipei

Intelligent Community Forum

SMART 21 Intelligent Communities of the Year

Source : ICF

ICF 5 indicators : Broadband connectivity, Knowledge workforce, Innovation, Digital inclusion, Marketing and Advocacy

Taiwan Smart Cities Roadmap and Experience can help Emerging Countries Leapfrog

Upgrade Happiness Index of citizens

2014 - 2017

4G Smart Broadband Applications City

Drive smart cities and industries with applications

Smart Cities

Help emerging countries leapfrog.

i –Taiwan (2009-2014)

M-Taiwan (2005-2009)

e-Taiwan (2002-2007)

Wifi City

2010

Infrastructure of fiber, wireless and mobile integration

2014

4G broadband coverage, Convenient applications

4G City

201

2020

Export smart cities solution of Int' l Index

- 7 Life Convenience
- Citizen Ownership
- Industry Upgrade

Source: III MIC(2014/8)

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IoT Building Blocks for Indian Smart Cities

S.no	Component	Cities	Count
1	Centralised command and control centre	Bhubaneshwar, Surat, Kochi, Ahmedabad, Jabalpur, Visakhapatnam, Davanagere, Indore, Coimbatore, Belagavi,Udaipur, Ludhiana, Bhopal	13
2	Transit operations system (maintenance and tracking)	Bhubaneshwar, Pune, Jaipur, Ahmedabad, Indore, Solapur, Davanagere, Indore, Kakinada, Udaipur, Guwahati	10
3	Smart parking system	Bhubaneshwar, Pune, Jaipur, Davanagere, Indore, Coimbatore, Kakinada, Udaipur, Guwahati, Chennai, Bhopal	11
4	Common card (payment and operations)	Bhubaneshwar, Jaipur, Surat, Ahmedabad, Indore, Udaipur, Guwahati	7
5	Area based traffic control	Bhubaneshwar, Pune, Ahmedabad, Davanagere, Indore, Coimbatore, Kakinada	7
6	leak identification system (SCADA/ and AMR)	Pune, Ahmedabad, Solapur, NDMC, Kakinada, Udaipur	6
7	Platform for citizen engagement and all citizen services; city dash board	Kochi, Visakhapatnam, Solapur, Davanagere, Indore, Bhopal	6
8	Traffic mobile app	Pune, Jaipur, Ahmedabad, Indore, Guwahati	5
9	Smart metering (water)	Pune, Kochi, Vizag, Solapur, NDMC, Coimbatore, Belagavi, Udaipur	8
10	CCTV surveillance	Pune, Ahmedabad, Devangere, Indore, Coimbatore, Guwahati, Bhopal	7
11	Emergency response	Bhubaneshwar,Surat, Ahmedabad, Visakhapatnam, Coimbatore, Udaipur	6
12	Public Information system	Pune, Ahmedabad, Davanagere, Indore,	4
13	Public transit and traffic operations and mangement centre	Jaipur, Surat, Ahmedabad,Devangere, Vizag, Indore, Belagavi, Udaipur	8
14	GPS tracking and optimisation of routes of garbage trucks	Jaipur, Jabalpur, Indore, Kakinada	4
15	Wifi- IT connectivity	Pune, Surat, Kochi, Coimbatore, Belagavi, Guwahati	6
16	NMT infrastructure	Devanagere, Belagavi, Udaipur, Guwahati, Chennai, Bhopal	6
17	LED street lighting	Coimbatore, Guwahati, Chennai, Bhopal	4
18	Traffic analysis or roads and video survielance inside bus using CCTV surviellance	Pune, Indore, Kakinada	3
19	Mobile app based SWM and cleaniliness monitoring	Jaipur, Jabalpur, Indore	3
20	Fleet management system	Jaipur, Ahmedabad, Indore,	3
21	Automatic fare collection system (transport)	Bhubaneshwar, Jaipur, Surat, Ahmedabad, Indore,	5
22	Variable message sign boards	Ahmedabad, Indore, Bhopal	3
23	Optical fibre enabled communication	Ahmedabad, Indore, Bhopal	3
24	Pedestrian infra	Belgavi, Udaipur, Guwahati	3

Source: smartcities.gov.in

Smart City Project major Solutions

Smart City Solutions

- Smart **LED Streetlight**
- Smart **City Wi-Fi**
- Smart **Surveillance**
- Smart **Digital Display**
- Smart (Tourist) **Bus**
- Smart **Command Center**
- Smart **LED Facade**
- Smart **U-Bikes**
- Smart **e-tags**
- Smart **Campus**
- Smart **Kiosk**
- Smart **Queue Management**
- Smart **e-Government**
- Smart **Telediagnosis**
- Smart **Electric Grid**
- **Recycling Waste Management System**

One Example of Smart Cities Systems Architecture

Smart LED StreetLight

City Wi-Fi

Smart Surveillance

Command Display System

Smart (Tourism) Bus

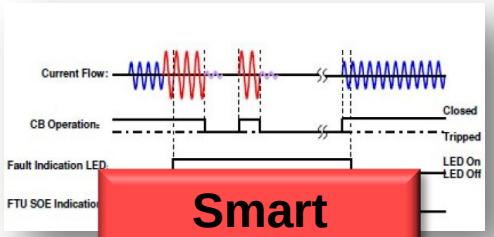
Light Management System

Wi-Fi Management System

Surveillance Manag.System

Signal Management System

Tourist Bus/ Smart City APP



Smart Electric Grid

Electricity Company

Command Control Centre

Control management system

台灣物聯網協會
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Taiwan Internet Of Thing Alliance
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Thank You !