Smart City

Health Energy Transportation Environment

Institute for Information Industry
Republic of China (Taiwan)

April 03, 2017
1. e-Registration System for Hospital Network

- Proven solution in Vysocina, Czech Republic and Asia
  - Czech Republic successful e-Registration system implementation and operation in Vysocina Regional Hospitals with +57,000 users
  - “2011 Best e-Government Service” prize awarded in Nov. 2011
    (1) Jihlava Hospital, system operation started in June 2011
    (2) Pelhrimov Hospital, system operation started in Feb 2012
    (3) 3 hospitals, system operation started in June 2012
  
- More than 30 hospitals with e-Registration System, Integrated Hospital Information System implemented in Taiwan, China, Vietnam
More than 57,000 Users
2011 Best e-Government Award, Czech
1. Citizens
- Make appointment any time, places, devices via Internet
- Know doctor expertise, schedule and hospital news easily
- Reminding appointment
- No more long waiting for diagnosis or treatment
- Make appointment to multiple city hospitals
- Referring from Clinic/GP system

2. Doctors / Nurses
- Know up-to-date patient appointment list and symptoms
- Flexible setting session maximum registration number
- Make patient next appointment in hospital
- Know patient visiting pattern by gender, age,.. etc.

3. Government / Hospital Executives
- Offer versatile appointment services to citizens
- Know patient visiting pattern by age, gender, area, profession,.. etc.
- Know patient service loading number by hospital, unit, doctor, time interval, etc.

4. Hospital Counter Staff
- No need to re-type patient demographic data, etc.
- No need to generate patient visiting statistic report manually
Benefits: Citizens

**e-Registration system**

- Any time
- Any place
- Any device

**LAN/WAN Voice net**

- Desktop
- Laptop
- Tablet
- Smart phone
- Telephone
- Kiosk

Make appointment

- Any time
- Any place
- Any device
Benefits: Citizens

No more long waiting:
- Know the visiting time

Your Appointment Information:
1. Appointment Date/Session: 27.03.2013 (Wednesday) 15:00 - 16:00
2. Ambulance: Test Ambulance
3. Physician: Dubaň Štefan
4. Sequence: 1
5. Max. No.: 11
Benefits: Citizens

Know:
- Doctor expertise,
- Doctor schedules
- Hospital News

Make appointment to expected:
- Doctor
- Schedule
Hospital group or multi-location support for City and Region

- Hospital group
  - Hospital Jihlava
  - ...

- Multi-location
- Integrate with local GP system
2. Intelligent Energy Management System (IEMS) 
Cloud-based In-Snergy Provides 4+1 Solutions

Global Services

Green IOT Cloud Services

Green IOT Applications

In-Solar
Renewable Energy Solutions

Ectuary
Enterprise Energy Management Solutions

iFamily
Smart/Green Home Solutions

In-Light
Smart Lighting Management Solutions
Cloud-Based Intelligent Energy Management System (IEMS)
World 2011 R&D 100 Awards – More then 45 International Patents

In-Snergy (Internet Smart energy):

– Green IOT (Internet of Things) Platform
– Internet-based cloud technology offers always-on 24 hours a day year-round service in monitoring and optimizing electricity usage environment to raise power usage efficiency and help to ensure comfortable outdoor and indoor environments
– Simple, adaptable, ready-to-use energy monitoring and management solution, applicable in various environments
– A scalable cloud platform, that is easily installed to offer the desired features based on end-customers' needs
– Capable to interact with and manage large-scale sensor equipment
– Based on Open data communication interface (JSON/ SOAP) that can easily integrate with commercially available sensor devices, electric meters, and others
– More than 370 users worldwide in Europe, Africa, Asia
The chart shows the power consumption and the power demand are not matching. It indicates some equipment are powered-on in the same time.

The peak demand power was caused by the power-on of the waste water treatment plant WWTP.
IEMS System Display – Report Management (Sample)

• Daily power demand report: Hourly records of power consumption and time of *maximum demand, with trend diagrams
Transformer Efficiency Diagnosis and Analysis (Sample)

- **Input**: 587.32 kW
- **Output**: 415.27 kW
- **System Loss**: 587.32 - 415.27 = 172.05 kW
- **Transformer Loss**: 172.05/587.32 * 100% = 29%

**Transformer Loss**: 29%
3. e-Ticketing of City Bus, Metro and Other Applications

(1) Smart EasyCard for Taipei MRT
(2) Bus
(3) Smart EASYCARD

• A contactless IC card with an embedded chip and wired antenna. Its functions include data storage, logical operations, security, and more.

• Usage area: MRT, buses, trains, parking lots and merchants, etc.
<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>EasyCard Corporation established</td>
</tr>
<tr>
<td>2002</td>
<td>EasyCard launched on public transport systems</td>
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<tr>
<td>2006</td>
<td>Co-brand cards issued with auto top-up service</td>
</tr>
<tr>
<td>2007</td>
<td>More than 10 million cards issued</td>
</tr>
<tr>
<td>2010</td>
<td>Small-value purchase service launched</td>
</tr>
<tr>
<td>2012</td>
<td>Second-Generation EasyCard launched</td>
</tr>
<tr>
<td>2016</td>
<td>More than 65 million cards issued</td>
</tr>
</tbody>
</table>
A. The European Bank for Reconstruction and Development (EBRD) is helping to modernize public bus transport in the Romanian City of Pitesti with 13 million EURO loan to the City.

B. The EBRD loan will allow the city to upgrade its aging fleet with the purchase of 70 new environmentally friendly buses. The loan will also be used to introduce an Automated Fare Collection System (AFC), using Contactless Smart Card.

C. Through EBRD tendering processing, III consortium, integrating the members of e-Ticketing experts, has awarded the contract in 2015 to contribute the successful best practice of Taiwan for the City of Pitesti for city bus transportation.
(5) AFC System Architecture for Bus

**Bus Dispatching Center**
- LCD Display Wall

**e-Ticketing Operation Office**
- Ticket
- Pass

**Portable Validator Control Office**
- 

**Computer Room – Central Systems of AFC**
1. **(1) AFC Host System**
2. **(2) Settlement and Clearing System**
3. **(3) Internet Recharging System**
4. **(4) Key & Card Mgmt System**
5. **(5) Ticketing Equipment Mgmt System**
6. **(6) Passenger Information Service (PIS) System**
7. **(7) Bus Fleet Mgmt System**
8. **(8) Network System**

**On Board Equipment**
- OBAVM, OBTV, OBC & Driver Console, On Bus Display Board
- Portable Validator
- e-Bus Stop Display
- Ticket Booth: Kiosk type (Ticket Workstation, POS)
- Ticket Booth: Office type (Ticket Workstation, POS, Card Printer)
- AVM

**Outdoor Equipment**
- Service Center (Ticket Workstation, POS, Card Printer)

**Indoor Equipment**
- 

**Depot Wireless Hub**
- 3G/4G
- Wired Network

**Internet**
(6) Expected Benefit of the AFC System

1. Benefit for Client
   (1) Reducing the usage of paper tickets and passes, environmental friendly
   (2) Facilitating transportation planning
   (3) Enhancing the customer’s service quality
   (4) Increasing operation revenue
   (5) Supporting tariff changes
   (6) Supporting future operation expansion

2. Benefit for passengers
   (1) Efficient validating and reloading
   (2) Flexible tariff

3. Benefit for city government

4. Other transportation operators and service providers in the future
(7) AFC System Financial Analysis - Cost and ROI

1. **Investment Cost**: 3,600,000 Euro (System equipment and installation, 70 Buses)
2. **Operational Cost Before AFC System**: 33,700 Euro/month
3. **Operational Cost with AFC System**: 52,500 Euro/month,
4. **Monthly Operational Cost increase after the implementation of AFC system, mainly for the system maintenance and operation**: 18,800 Euro
5. **Revenues from sales of tickets**: 3,360,000 Euro/year, 280,000 Euro/Month
6. **Subsidy of ticket selling from City Government will be 90% of total revenue**

<table>
<thead>
<tr>
<th></th>
<th>A. The additional monthly expenses incurred with the implementation of AFC system</th>
<th>B. Reduction of the cash leakage rate</th>
<th>C. Revenue increase with the reduction of the cash leakage rate</th>
<th>D. Monthly profit and loss after adding the revenue from the reduction of the cash leakage rate</th>
<th>E. Annual profit and loss after adding the revenue from the reduction of the cash leakage rate</th>
<th>F. ROI by year</th>
<th>G. ROI by year including subsidy from City Government</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>18,800 Euro</td>
<td>6.714%</td>
<td>18,800 Euro</td>
<td>0</td>
<td>0</td>
<td>5.95 year</td>
<td></td>
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<tr>
<td>2</td>
<td>18,800 Euro</td>
<td>10%*</td>
<td>28,000 Euro</td>
<td>9,200 Euro</td>
<td>110,400 Euro</td>
<td>32.6 year</td>
<td>5.03 year</td>
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<tr>
<td>3</td>
<td>18,800 Euro</td>
<td>20%*</td>
<td>56,000 Euro</td>
<td>37,200 Euro</td>
<td>446,400 Euro</td>
<td>8.06 year</td>
<td>3.42 year</td>
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<tr>
<td>4</td>
<td>18,800 Euro</td>
<td>30%*</td>
<td>72,000 Euro</td>
<td>53,200 Euro</td>
<td>638,400 Euro</td>
<td>5.64 year</td>
<td>2.90 year</td>
</tr>
</tbody>
</table>

*The estimated reduction of the cash leakage rate will be ranged from 15~30% after the implementation of AFC.
4. Intelligent Lighting Monitoring and Control - System Lighting Map, Romania, 2015
Before the replacement of LED lighting, the lighting was High Pressure Sodium/HPS). The HPS lights were not bright, and the road were not bright either.

After the Installation of LED Lighting, The brightness of road has improved Substantially.
1. 7 100W LED street lights replaced 150W HPS lights
2. 2015-5-7 to 26, the daily total power consumption of LED lights was 6 kWh. Comparing to the original 150W HPS lights with daily total power consumption 14 kWh, Power Saving = (14-6 = 8) / 14 kWh = 57%
(3) Thanks from the Deputy Mayor for the Successful Implementation of the LED Lighting and Intelligent Monitoring System
(4) LED Lighting Photos Zalau
This version offers control for individual lights. Each light can be 100% controlled for activation, deactivation, dimming, and scheduling. It also offers both wired and wireless communication solutions and is suitable for control required of individual light.
Based on electric circuits, this version’s street light monitoring control has the ability to remotely control or schedule the operation of street lights of entire circuits. Compared with the single-light control, this version significantly reduces equipment and installation costs and is more suitable for circuit-based with control required field.
(8) Functions / Features

**Map management**
- Street light information
- Real-time power consumption monitoring
- Error event management
- Supported maps: Google Map, ArcGIS, Bing Map, Open Layer

**Intelligent diagnostics**
- Big data analysis
- Green expert rule engine
- Historical profile

**System Statistics**
- Statistics of power consumption
- Statistics of street light life hour
- Statistics of error reasons
- Statistics of cumulative carbon emissions

**Street light curriculum vitae**
- Health status of devices
- Error event history
- Analysis of possible reasons of errors
- Suggestions for trouble shooting

**Intelligent control**
- Single street light management
- Street lights group management
- Scheduled on-off time, light sensing management

**Repair management**
- Management of repairing notification
- Maintenance of the service personal lists of warranty company
- Repair history management
• System operation status diagnose for Internet and networking, Light on-off time, and power
ISSS 2017, Hradec Kralove

THANK YOU