A Survey of IoT in Thailand

Prof. Dr. Srisakdi Charmonman
Asian Computer Man, Father of Thai eLearning,
Father of Thai Internet,
Father of Thai IoT,
Fellow of the Royal Institution of Great Britain
Honorary President of the Computer Association of Thailand Under the Royal Patronage of HM the King

Charmonman@gmail.com
www.charm.SiamTechU.net

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Co-Author

Pornphisud Mongkhonvanit
President of Siam Technology College
President of Thailand Chapter of the Internet Society
President of Thailand Chapter of the ACM
President of Thailand Chapter of the Computer Society of the IEEE

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Introduction

The document “5 predictions for the Internet of Things in 2016” [1], stated 4 interesting points:

1) IBM invested US$3 billion in its IoT business unit.
2) AT&T announced adding a record 1.6 million connected device, including 1 million IoT-enabled cars in the third quarter of 2015.
3) Earlier in the year, Samsung declared its commitment to connecting everything it sells by 2020.

4) General Motors shared that its OnStar 4G capabilities would generate US$350 million in profit over the next three years.
The document “Over 200 Global Universities and Colleges now offer the PTC Internet of Things Academic Program” [2] stated that there over 200 universities and colleges offering IoT academic program using “ThingWorx IoT Platform” [3].
There are a lot of other IoT Platform such as those mentioned in the document “Top 10 IoT Platforms” [4], such as:

- Microsoft Azure,
- IBM Watson,
- Salesforce IoT Cloud,
- Oracle Integrated Cloud,
- Amazon Web Service,
- Cisco IoT Cloud,
- Carriots IoT,
- General Electric’s Predix,
- etc
Therefore, Thailand has to join IoT to be able to compete with other countries in ASEAN and in the world.
The senior author of this paper has his “Internet IT with Srisakdi Charmonman” radio program on Radio Thailand about one hour per week, his “Internet IT with Srisakdi Charmonman” TV program on DLF TV Station about one hour per week, his newspaper column on Telecom Journal, his invited papers a few times a month, and etc.
Since IoT is one of the most talk-about topics, he has to search Google every day to keep up-to-date on IoT.

This paper will present six sets of examples of IoT activities in Thailand.
Introduction (Cont.)

- The first set of examples is at universities and colleges.
- The second set of examples is at IoT companies.
- The third set of examples is from groups of persons interested in IoT;
- The fourth set of examples is IoT by organizers of seminars and conferences.
The fifth set of examples is learned societies which have activities on IoT.

The sixth set of examples is at Government agencies.
Several universities and colleges in Thailand have started or are planning to start IoT activities.

The first example is Siam Technology College (STC) which has declared to be “Smart Campus”.
A group of faculty members have been taking online IoT courses from the US. An IoT laboratory is being established.
STC is the seat of Thailand Chapter of several international learned societies such as

- Thailand Chapter of the Computer Society of the Institute of Electrical and Electronics Engineers (IEEE),
- Thailand Chapter of the Association of Computing Machinery (ACM),
- Thailand Chapter of the Internet Society (ISOC), and so faculty and staff members as well as students have been encouraged to participate in IoT activities of those organizations.
The second example is King Mongkut's Institute of Technology Ladkrabang (KMITL).

As a matter of fact, KMITL, KMUTT (King Mongkut’s University of Technology Thonburi, and KMUTNB (King Mongkut's University of Technology North Bangkok))
The three organizations used to be three campuses of King Mongkut’s but they are now independent and are actively involved with IoT.
However, due to limited time available for the presentation of this paper, KMITL will be discussed as an example.
IoT Activities at Universities and Colleges (Cont.)

- KMITL has established Smart City Research Center (SCRC) [5] and announced several IoT research projects such as:
  1) Design and Development of Automatic Speed Warning.
  2) Design and Development of Hazardous Material Truck System.
3) City Decision Support and Management System.

4) Lane Control Management System.

5) Traffic State Estimation System.
The third example is Southeast Asia University which registered with Microsoft Lab of Things to establish an IoT Lab and offer a Bachelor’s degree program of Computer Engineering (Internet of Things) [6].
3. IoT Activities by IoT Companies

- As of the year 2016, the number of IoT companies in Thailand is still small but more and more companies will branch into IoT.
- Three examples will be given in this Section of the paper.
The first example is CAT Telecommunications Co., Ltd or CAT which has joined with NIA or the National Innovation Agency (Public Organization) which is under the Ministry of Science and Technology,
and Thai Embedded Systems Association or TESA, to establish "IOT City Innovation Center"[7].

- This Center aims to develop the innovative ecosystem-based, Internet of Thing (IOT), by encouraging the promotion of innovation and driving the business innovation for entrepreneurs in the field of information and communications technology.
The aim is for the entrepreneurs to be able to develop products and solutions for intelligent city management with the quality level conforming to the international standards.
The second example is a Thai company by the name of “FutureLifestyle” [8] which is authorized dealer for FIBARO selling IoT devices.
The third example is a company in Thailand named Gravitech which designed and built LAMBDA Board for IoT at low cost [9].
The fourth example is True Corporation which announced cooperation with Jasper to provide IoT services in Thailand [10, 11].

Sample services are Connected Cars, Fleet Management, and Smart Cities.
As IoT is getting more and more popular, IoT special interest groups are organized all over the world.

In Thailand as of the year 2016, there is one group which is quite active.
It is “Thailand IoT Consortium” which is a group of about 30-40 persons.

Once every month or two, the Consortium organize:

1) a meeting of members,
2) a lecture by an expert,
3) a MakeAthon or Maker Holic,
4) a HackAthon or Hacker Holic [12].
Mr. Panutat Tejasen, the President of the Thailand IoT Consortium said “Given the country's resources of highly technically skilled engineers and industrial manufacturing bases,
Mr. Panutat also said that the advent of the IoT will shake up things in a number of industries and that smart home was expected to enjoy mass adoption next year, driven mainly by wearable devices, embedded system programming, and high-speed wireless broadband Internet.
5. IoT by Organizers of Seminars and Conferences

- In Thailand, there are IoT-related seminars and conferences.

- For examples, there are 5 events from May to December 2016. They are:
  1) 26 - 27 May 2016, IoT Thailand organized by Asia IoT Business Platform.
2) 6 July 2016, IoT Track of INRIT2016
   by the Office of the Royal Society of Thailand
   and several Learned Societies.

3) 27 - 28 August 2016,
   Bangkok International Conference
   on Internet of Things (BkkIoT2016)
4) 8-9 October 2016, the 11th International Conference on eBussiness (iNCEB2016) with the Track on IoT in eBusiness.

5) 16-17 December 2016, the 13th International Conference on E-Learning for Knowledge-Based Society with a Track on IoT in E-Learning.
Similar to the cases of other countries, there are a lot of Learned Societies in Thailand. Three examples will be given in this paper.
The first example of learned society with IoT activities is “IEEE or The Institute of Electrical and Electronics Engineers” which has a group of members interested in IoT called “IoT.IEEE.org” [13] which has IoT-related activities.
Sample activities of IoT.IEEE.org:

1) Along with the IEEE Internet Initiative, submitted comments on the National Telecommunication and Information Administration's role in promoting and regulating the IoT.
2) Explore the convergence of IoT and the related technologies that will create the beginnings of a sentient and interactive physical environment.
The second example of learned society with IoT activities is “ACM” or the “Association for Computing Machinery” [14].
The ACM U.S. Public Policy Council submitted comments to “NTIA” (National Telecommunications and Information Administration) on the potential benefits and challenges of the Internet of Things and what role the U.S. Government should play in this area.
Sample highlights from USACM’s comments on the Internet of Things are:

1) Defining IoT,
2) Cybersecurity Concerns Raised Specifically by IoT,
3) Privacy Concerns about IoT and Related Technical Considerations,
4) Factors to Consider in International Engagement.
The third example of learned society with IoT activities is “ISOC or the Internet Society” which carries out IoT activities such as: in the document “Internet of Things (IoT)” [15]
IoT Activities at Learned Societies (Cont.)

- ISOC document submitted to “Russian Internet Forum (RIF)” organised by the Russian Association of Electronic Communications (RAEC) with support of other Russian Internet organizations.
- The Forum took place on the outskirts of Moscow on 13-15 April 2016.
More than 7,000 IT professionals and other Internet enthusiasts debated the hottest tech trends in Russia and to network with their peers [15].

Discussed are security, privacy, interoperability, standards, legal regulatory and rights, emerging economy and development issues.
Several Thai Government agencies have started IoT activities.

The first example is the Ministry of Science and Technology by the National Innovation Agency (Public Organization) or NIA [16],
IoT Activities by Thai Government Agencies (Cont.)

- in cooperation with
  CAT Telecommunications Co., Ltd or CAT
  and Thai Embedded Systems Association or TESA,
  held a press conference
  on the cooperation and launching
  of "IOT City Innovation Center",
The Center aims to develop the innovative ecosystem-based, Internet of Thing (IOT), by encouraging the promotion of innovation and driving the business innovation for entrepreneurs.
Encouraging entrepreneurs to be able to develop products and solutions for intelligent city management with the quality level conforming to the international standards.
The second example is the National Electronics and Computer Technology Center or NECTEC which plans to launch Net Pie, a network platform to provide support for IoT developers [17].
IoT Activities by Thai Government Agencies (Cont.)

NECTEC announced that

“To capture the huge potential of IoT,

the National Electronics

and Computer Technology Centre

will launch NETPIE, a network platform for IoT
This platform aims to provide support for general IoT developers. The developers just put the NETPIE library on their device which then takes care of all the connections.
The third example includes:

- Smart Thailand,
- Smart Bangkok,
- Smart Chiang Mai,
- Smart Phuket,
- etc.
8. Concluding Remarks

- Machina Research stated that the IoT market was about 900 million US$ in the year 2014 and will increase to about 4.3 trillion US$ in 2024.
- IBM invested 3 billion US$ in its IoT business unit.
- Samsung declared its commitment to having everything it sells connected to IoT by the year 2020.
Over 200 global universities and colleges are now offering IoT academic programs.

This paper has shown that Thailand has been actively using and plan to continue using IoT to be competitive.
Presented are examples of using IoT in universities and colleges, in IoT companies, in groups of persons, in organizing seminars and conferences, in learned societies, and in Government agencies.
However, IoT is progressing very rapidly and so all parties concerned must search the Internet for up-to-date information to study and decide how to make applications for the benefits of themselves, their organizations, and their countries.
REFERENCES


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