

MALAYSIA EXPERIENCE IN STRATEGY FOR DEVELOPMENT AND APPLICATION OF INTERNET OF THINGS AND PROPOSALS FOR VIETNAM

Duong Khanh Duong¹

Institute of Information and Communication Strategic Studies,
Ministry of Information and Communication

Bach Tan Sinh

Academy of Science, Technology and Innovation,
Ministry of Science-Technology

Abstract:

This paper provides Malaysia experience in building strategies for development and application of Internet of Things (IoT) including various aspects: status of readiness for development and application of IoT, objectives and roadmaps. Malaysia is considered as a successful country of South-East Asia region for application of IoT not only for economic growth but for change of ways to manage and operate economic and social activities and to enhance life quality of people. The Government plays important roles of constructive and strategic nature for development and application of IoT. From Malaysia experiences some proposals are made as hints for Vietnam in building strategies for development and application of IoT.

Keywords: *IoT; Innovative eco system.*

Code: 18091901

1. Socio-economic context

Malaysia is a country with federal constitutional monarchy state structure in South-East Asia region. The country has 13 states and 3 federal territories with the total land superficies of 329,847 km². Malaysia is a multi-national and multi-cultural country. Malaysia is developing to a new industrialized country where the State plays important roles in governance of economic activities through macro economic programs. However, these roles have reducing trends to meet demands of open market economy. Malaysia is among the fast developing economies in Asia. By 2016, Malaysia GDP was about USD302 billion with the average value of USD12,000 per capita and economic growth rate of 4.2%².

¹ Author's contact email address: dkduong@mic.gov.vn

² https://vi.wikipedia.org/wiki/Kinh_t%E1%BA%BF_Malaysia

2. Actual status of development of information-communication technologies

2.1. Status of development of information-communication technologies

Malaysia is one of the top Asian countries who have information-communication (IC) infrastructure ready for development and application of IoT. Its communication system is second to the one of Singapore among ASEAN countries with the full rate of mobile telephone subscribers and 70% of the population for Internet use. According to 2016 World Economic Forum (WEF) report on global information technologies, Malaysia network readiness index remains stable during recent years where Malaysia is 32nd ranked by 2016.

Table 1. Malaysia network readiness index

Rank	Countries/ Economies	Volume	Rank by 2015	National income rate	Group of nations
28	Bahrain	5.1	30	High	Middle East, North Africa and Pakistan
29	Lithuania	4.9	31	High	Advanced economy
30	Portugal	4.9	28	High. OECD	Advanced economy
31	Malaysia	4.9	32	High middle	Developing and emerging countries
32	Latvia	4.8	33	High	Advanced economy
33	Saudi Arabia	4.8	35	High	Middle East, North Africa and Pakistan
34	Malta	4.8	29	High	Advanced economy
35	Spain	4.8	34	High. OECD	Advanced economy

Source: WEF and INSEAD (2016)

The growth of international Internet bands of Malaysia (actually 81st rank) combined with the reduced price of wide bands (110th rank) increase forces of Malaysia digital economy (*WEF and INSEAD. 2016*).

Table 2. Mobile network coverage rate

Rank	Countries	Volumes
100	Swaziland	96,8
101	Laos	96
101	Panama	96
103	Malaysia	95,4
104	Chile	95
104	Jamaica	95

Rank	Countries	Volumes
104	Russian Federation	95
104	Tanzania	95
105	Iran	94,2

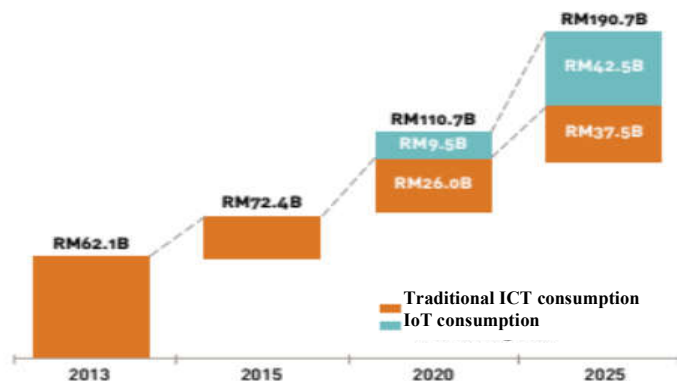
Source: WEF and INSEAD (2016)

According to a report by Malaysia Statistics Authority, ICT sector keeps growing in the X-th Plan of Malaysia (2011-2015) with the average rate of 6.8% per year, the volume of consuming market of RM118.6 billion by 2015 (which is forecast to be RM117.6 billion by 2020) and the Compound Annual Growth Rate (CAGR) of 8.32%. In the XI-th Plan of Malaysia (2016-2020) the Government makes efforts to increase the ICT share for GDP to grow from 13.1% in the X-th Plan to 17% (MOSTI, 2015).

The above noted basic figures on IC technologies are highly favourable as spring board for development and application of IoT in Malaysia.

2.2. Opportunities for development and application of IoT

According to forecast by Gartner, Frost and Sullivan, IoT can make impacts to increase additionally GDP of Malaysia by RM9.5 billion by 2020. After this year, the growth rate will be multiply increased and come to RM42.5 billion by 2025. In this total, applications and services, analysis and forecast technologies are expected to be about RM7.5 billion by 2020 and RM34 billion by 2025, equipment manufacturing industry to be RM 4.3 billion by 2025. IoT is also expected to become a factor to push up existing economic initiatives such as Economic Transformation Program (ETP), Government Transformation Program (GTP), Digital Malaysia (DM) and Digital Lifestyle Malaysia (DLM).



Source: MOSTI (2015) (Extracted from Gartner, Frost and Sullivan)

Figure 1. Forecast impacts of IoT to Malaysia economy

In addition to financial impacts, IoT of Malaysia can create 14,000 high skill jobs by 2020.

2.3. Challenges in development and application of IoT

Despite of huge opportunities offered by IoT, Malaysia, as emerging economy, develops socio-economic and science and technology backgrounds in general and ICT background in particular. Malaysian Ministry of Science-Technology-Innovation (MOSTI) defined certain challenges to be settled to achieve expected results. They include: Infrastructure, Data and information, Security and Information privacy rights, Talent human resources and Eco system. In addition to that, the main weak points of Malaysia as defined include the dispersal of institutional systems, human resources and, most of all, technological background for IoT. In that, in terms of the readiness for data access and sharing, financial mechanisms are segmented and then cannot make impacts as desired. They weaken links between sectors and State authorities and then lead to dispersive situation in implementation and realization of initiatives.

3. Roadmap of National IoT Strategies of Malaysia

Realizing huge potentials offered by IoT as well as blocking limitations and challenges in development and application of IoT, the Malaysian Government conducted the building of the National IoT Strategic Roadmap since 2014. Due to intersectorial nature of IoT technologies the Malaysian Government sets up a working group from about 60 organizations including State agencies (MOSTI, Communication and Multimedia Committee and etc.), universities, enterprises (local and foreign including multi-national corporations such as IBM, Cisco, Intel, Microsoft and others). This working group holds many workshops, round tables and working sessions for collection of ideas from concerned actors and communities on strategies for IoT development and application.

3.1. Vision and mission

Vision: Malaysia will become a center for IoT development of South-East Asia region.

Mission: Start-up of national IoT eco system for promotion of IoT application and implementation in industrial scale as a new growth source. The basic tasks include:

- Developing and maintaining IoT sectors with high level of competitiveness, creativity and values with the leading position among the countries in the region;

- Starting strategic and effective cooperation relations;
- Offering favourable conditions for effective development and implementation of IoT;
- Attracting, developing and retaining talents in IoT sector, developing SMEs to a new level in development and application of IoT;
- Enhancing capabilities of IoT sector for maintaining economic growth.

3.2. Objectives

The objectives in the National IoT Strategic Roadmap of Malaysia are intensive integration of concerned actors with the center focus on high value producing sectors. They would form the basic background for Malaysian IoT and other sectors on basis of IC technologies and IoT technologies. The concrete three objectives were noted in the National IoT Strategic Roadmap, namely:

- Creating a favourable IoT industrial eco system for promotion of development, dissemination and application of IoT technologies;
- Enhancing business capacities, development of IoT services and products capable of global competition for higher Malaysian positions in IoT industry sector;
- Developing Malaysia to a leading IoT center of the region with establishment of a center for integration of IoT solutions which gets equipped with supporting services and facilities such as tests of interaction and development of IoT products and services. Malaysia will become a favourable site of outsourcing IoT services for industrial sectors of Malaysia and the world.

For realization of IoT development objectives of Malaysia, in the National IoT Strategic Roadmap, the Malaysian Government had built up short term and long term strategies. These strategies are implemented for development of IoT industry sector of Malaysia from introduction stage to growth stage, together with the formation of a sustainable industrial eco system, will turn Malaysia to a leading position of IoT development in the region.

3.3. Strategies under implementation

3.3.1. Short term strategies

Strategy 1. Realization of transformation steps for development of IoT to an industry:

- Development of related capabilities of SMEs as starting stage of IoT industry;
- Enhancement of potentials of SMEs through priority projects focused on health care and agriculture sectors;
- Development of key human resources which will be capable of building up better IoT application solutions for future.

Strategy 2. Connection to actual initiatives through pilot projects:

- Pilot projects will play catalysing roles and lead collaboration between enterprises in sectors as illustration and evidence of impacts of IoT to life quality;
- This strategy is to enhance awareness on applicability and positive impacts from IoT.

3.3.2. Long term strategies

Strategy 1. Formation of Malaysia IoT

- Objectives of this strategy are to establish Communities of Practice (CoP) for development of IoT in Malaysia where the communities include components of industrial sectors with the same interests to build an IoT sector;
- Partner relations will be a self-governance eco system which maintains and connects to the roadmap of IoT development.

Main roles:

- Governance and promotion of eco systems;
- Background for collection of technologies required for an industrial sector;
- Supply of shared services for development of industries in Malaysia;
- Communities of practice will operate as driving forces for development of IoT talents and as an office for development of IoT industrial sector.

Strategy 2. Establishment of Open Creativity Framework.

Open Creativity Framework is not a standard initiative but a framework for harmonization of technologies required for development of IoT technologies in Malaysia.

Main roles:

- Harmonization of numerous standards;

- Enhancement of competing capacities of local enterprises;
- Realization of activities for creation of new technologies.

Strategy 3. Formation of Open Community Data Framework.

- Next level of development modes of the industrial sector through establishment of Open Community Data for extension of IoT applications.

Main roles:

- Establishment of definition criteria of Open Community Data;
- Establishment of data synthesis system for standardization of data formats and reduction of hazards against data confidentiality;
- Management of commercial aspects of data for formation of new revenue flows and new values.

In short term strategies, Malaysia develops IoT on basis of concrete visions focused on development of capacities of SMEs and implementation of projects of advancing IoT applications while in long term strategies Malaysia offers open rooms for various IoT technologies through the three long term strategies which will: (i) Create Malaysian IoT with models to connect and ally associations, enterprises and the Government; (ii) Create background for Open Creativity focused not only on establishment of standards but also a framework for development of IoT technologies on basis of harmonic development of different technologies; and (iii) Create of Open Data Framework for community use which orients to public database for multiplication of IoT applications.

4. Conclusion and proposal of lessons for Vietnam

Malaysia had made public the national strategies for IoT development including numerous recommendations and strategies for action, defined IoT sustainable development stages and built the program Digital Lifestyle of Malaysia Initiative for intensive promotion of links between digital lifestyle and IoT application. This would provide a strategic background for propagation of IoT based benefits for users through measures to meet opportunities of provision of services for creation of new values in added value chains of IoT industrial sector.

Malaysia bases IoT development on clear and focused visions on development of capacities for SMEs and, at the same time, offers open rooms for different IoT technologies. The reason of this policy selection by Malaysia maybe comes from a reality that Malaysian enterprises cannot

change the games and substitute the world's large companies within short time. Then the realistic objective would be to increase the number of SMEs in this game and, at the same time, to take part in another open game to catch the master position in regional markets.

Some lessons as hints for Vietnam can be proposed from Malaysia experiences, namely:

Building and issuing the strategic roadmap for national IoT development with well defined short term and long term orientations. In immediate plans, Vietnam needs to build up the innovative eco system to support SMEs and start-ups through cooperation with global partners for definition of standards and kick-off of this eco system and favours to attract start-ups from the region and the world for participation as well as to maximize use of strong potentials of local human resources and production costs in Vietnam.

Establishing a practice community for IoT development in Vietnam where this community includes actors of industrial sectors with common interests and efforts to build up the IoT industrial sector. This community would include innovative start-ups, research organizations in universities and research institutes in IoT sector.

Building up the open creativity eco system for IoT development, the Government offers institutional frameworks to support start-ups through creating open source platform (open hardware and software), sharing public data and identifying social needs and, on basis of that, start-ups can fast produce flexible applications to meet social needs. One of the immediate targets relates to formation of identity database to replace the actual passport and identity card. With the actual increase rate of about 1 million habitants per year, the Vietnam population will be about 110 million habitants by 2030 from the population of 96 million habitants by 2017³. This plan will create a market big enough to get economic advantages thanks to its scale. This open and big size database can be exploited for many purposes.

Building competitive advantages in some specific and important fields. This would orient the IoT market to some fields where Vietnam has advantageous positions such as agriculture, tourism, natural disaster and hazard management and response to climate change. These fields will create advancing projects to enhance capacities of SMEs for higher competitiveness in local, regional and international markets./.

³ Source: <<http://danso.org/viet-nam/>>

REFERENCES

1. Frost and Sullivan. 2012. Review of National ICT Strategic Roadmap & Technology roadmaps. 2012. Ministry of Science, Technology and Innovation.
2. MOSTI. 2015. National IoT Strategic Roadmap.
3. Bloomberg Innovation Index 2016.
4. WEF and INSEAD. 2016. The Global Information Technology Report 2016.
5. Malaysia - Information & Communications Technology. 2017.