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**A COMPREHENSIVE SMART HOME LEGAL FRAMEWORK IN  
MALAYSIA: A NECESSITY**

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***Abstract***

Smart Home is focusing on wellbeing, security and ease with the integration of innovative technology assistance. Life is expected to be easier, simpler and more convenient with embedded system in a home through the installation of advance and complete technologies, particularly to the high-tech lovers, middle and high class families, people with frantic lifestyles, pro-technology, developers, suppliers and youth. Hence, a comprehensive Smart Home legal framework is required. This paper is intended to discuss the amendments needed to the housing development law. This article adopts socio legal research whereby statutory provision is analysed corroborated with the view of experts conducted during interview. The legal doctrinal analysis was used to analyse the statutory provisions for example Malaysia housing statutes, codes, and guidelines. Thematic analysis was used to analyse the data is gathered from the interviews with 13 experts in the aspect of smart home. The experts consist of officers and professionals from various organizations both in public and private sector. The findings show that amendment and improvement to the following statutes and regulations is needed i.e. the Uniform Building By-Laws 1984, Housing Development (Control and Licensing) Act 1966 and its Regulation, the Street, Drainage and Building Act 1974 (Act 133), the Town and Country Planning Act 1976 (Act 176) and States' Planning Control Rules.

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## 1. Introduction

Smart home is a pattern of a house installed with advanced devices exists in a form of communications, networks, sensors, electronic and electrical devices as well as few appliances which are controllable, accessible and remotely monitored using a smart phone or tab (Basarudin et al., 2016). The fundamental concept of smart home is referring to the ability of technological devices to link with the existing network to ensure a good working system of a house (Balta et al., 2013).

Smart Home ('SH') means home which is provided with facilities supported by latest technological devices and computer control. The purpose of SH is to give convenience and supports to the occupiers. Apart from this, SH may also be designed to cater for the elderly and disable people as well as people of special needs (Chan et al., 2008). SH also emphasizes safety, security and comfort to its users (Ding et al., 2011) with modern technology integrated in it. There are five elements in SM viz personal computing, home automation, entertainment, telecommunication and security. By converting ordinary homes into SH using advance and complete technologies, life becomes easier, simpler and more convenient, especially to the technology lovers, medium and upper class families, people with hectic lifestyles, pro-technology, housing developers, device suppliers and teenagers (Smart Home Concept, 2003).

In Malaysia, the plan for future city aims at improving smartness on the aspect of easy movement and connectivity by concentrating on public transportation (instead of building more roads) and enriching strategic ICT infrastructure for the purpose of making business process easier and also to have a lifestyle without actual movement on the roads. Expanding of ICT would also help in providing new economic opportunity for people living in city and in rural areas by providing training, job prospects and out-reach programmes. It also provides a secured living area as it will be monitored either by the security alarm system or by having cooperation among the police and communities to guarantee their life and property will be safe and protected. For example, the Iskandar Malaysia project adopts collaboration between Safe CAM and Rakan Cop. There should also be variation and options to provide education, health management and family-oriented facilities for the improvement of life and whole city members (Ismail, 2012).

According to Ismail (2012), other countries such as South Korea and Japan have promoted ICT and advanced technology based concept for smart cities unlike the concept introduced by Iskandar Malaysia that set vision for a sustainable metropolis of international standing centres purposely for balancing the economic development as well as sustainability in the aspect of environment and social. Thus, approach by the development of Iskandar Malaysia resembles to what has been implemented in European countries.

Due to the complexity of governing the SH project, it is necessary for Malaysia to have a comprehensive legal framework on SH. The conventional housing law concept should be transformed and it is the objective of the paper to highlights some amendments to the law and policy that needs to be improved for the housing development at present and in the future.

## 2. Problem Statement

In countries such as US, UK, Czech Republic and Japan, smart homes are being designed to cater for the elderly, physically disabled and people with health issues using health care technologies. The smart environment translates physiological signs and behavioural patterns, makes prediction of health risk and initiates suitable action. According to the statistics published by the Japan Ministry of Economy, Trade and Industry (2011), the ratio of the quota of nursing care facilities and houses for the elderly to the elderly population Japan (2005) 4.4%, Denmark (2006) 10.7%, UK (2001) 11.7%, and US (2000) 6.2%. The technology ranges from assistive technologies to alarm triggering system up to tele-care and telemedicine (Chan et al., 2009).

The application of full SH is still not widely adopted among home owners in Malaysia. The reasons are the cost to install the SH network and the complication involve in using the system due to the advance technology used. Nonetheless, some partial and quasi-SH-products can be found in several areas such as Cyberjaya and Iskandar Malaysia. These houses serve special needs of the home occupants especially with regards to home security alarm system, ambience (lighting) and temperature control, home entertainment system, as well as window and door operations (Smart Home Concept, 2003).

The installation of SH network and appliances is the choice of the home proprietors themselves. They equip their homes with SH facilities themselves (DIY) or through independent contractors. According to our study, presently in Malaysia, the deployment of SH facilities encompassed of three main standardized technologies. These include X-10 (a protocol for communication network function to perform home automation), CEBus (short for Consumer Electronics Bus, also called as EIA-600, is a set of standards communication protocols for electronic devices to transmit commands and information) and LonWorks (a networking platform precisely created to address the needs of control applications), with X-10 being the most generally set up for home automation (Smart Home Concept, 2003). Examples of SH products in Malaysia are Intel energy saving equipment's, Osim automated cleaning equipment's, I-Berhad's security and home automation and Hugewin's wireless switch (Smart Home Concept, 2003).

The issue is whether by fixing the SH network and appliances in the housing development projects which are subject to Housing Development (Control & Licensing) Act 1966 (Act 118) (HDA) would be contrary to the requirements under the Street, Drainage and Building Act 1974 (Act 133) ('SDBA'), Town and Country Planning Act 1976 (Act 172)('TCPA'), States' Planning Control Rules and the Uniform Building By-laws 1984 ('UBBL')? The inclusion of SH products into the houses would be contrary to the requirements under the UBBL, SDBA and the approved building plan. It is emphasized, the consequence from that would cause Certificate of Completion and Compliance (CCC) will not be issued by the qualified persons (Professional Architect, Professional Engineer or building draughtsman) as the house is unsafe and unfit for human habitation (sections 20 and 21 of the SDBA).

Following the above elaboration certain conclusions can be emphasized regarding the use of SH products and facilities in Malaysia, viz:

- 1) There is no specific legal definition for SH;
- 2) There is no legal characteristics and features of SH; and,  
There is no one-stop-statute that governs SH

### 3. Research Questions

To what extent the smart home legal framework in Malaysia is adequate in protecting the home owner or consumer?

### 4. Purpose of the Study

The aim of the paper is to discuss and highlight current law and policy amendments that needs to be improved for the Malaysian housing development in the future.

### 5. Research Methods

This paper is a socio-legal study whereby legal doctrinal and qualitative research were employed. Mixed methods were adopted in analysing the data. The legal doctrinal analysis was used to analyse the statutory provisions for example Malaysia housing statutory law, codes, and guidelines. Thematic analysis was used to analyse the data is gathered from the interviews with 13 experts in the aspect of smart home. The experts include officers and professionals from organizations both in public and private sector as shown in Table 1 below.

**Table 01.** List of Respondents

No	Department
R1	Ministry of Urban Wellbeing, Housing and Local Government
R2	Ministry of Energy, Green Technology and Water
R3	Putrajaya Corporation
R4	Construction Industry Development Board
R5	Board of Quantity Surveyor
R6	Malaysian Communications and Multimedia Commission
R7	Board of Engineers
R8	Malaysian Industry-Government High Technology
R9	Iskandar Regional Development Authority
R10	Melaka Green Technology Council
R11	Intelligent Home Systems (MY) Sdn Bhd
R12	Chairman of Joint Management Body of Symphony Hills (Residential Place)
R13	Country Garden Sdn Bhd, Developer of Forest City ( Smart City Project)

### 6. Findings

The notion of smart city model is introduced in Iskandar Malaysia Johor. The target of a smart town programme is to improve the people standard of life and successful in achieving a sustainable economic and technological ecosystem that would finally create smart, integrated and inclusive communities. Iskandar Malaysia in Johor has been selected as the pilot region for a smart city model at national and international level during the first meeting of the Global Science and Innovation Advisory Council (GSIAC) in San Jose, California, in July 2012. The GSIAC was introduced by the Malaysian government and the New York Academy of Sciences in 2011 to drive Malaysia's efforts to accelerate economic development through technology, science and innovation (Musa, 2012).

According to Iskandar Regional Development Authority (IRDA) Dato' Ismail Ibrahim (2012), the Iskandar Malaysia Smart City Framework aims at promoting three important elements of its establishment including economy, environment and its surroundings and social aspects. These components will be the basis for building a smart city project which is encompassed of complex arrangement for human and social capital venture, blending of hard and soft infrastructure to ensure the concept of sustainability in economic development, quality life assurance and wise management of natural resources. These are all capable to be achieved with the strong involvement and support by the government. Based on the promotion of this smart city concept, a standard legal guideline is needed in ensuring smart city project is well governed in Malaysia.

The research found that there is an urgent need for Malaysia to develop its own definition of SH. It is proposed by According to R10, the problem in implementing smart home in Malaysia is due to the absence of standard guideline and framework to govern the whole process and monitor the work conducted by the developer. We should not just simply accepting foreign investors that propose to venture with Malaysian project without adhering to the specifications as we intended to. For example, the certain investors might want to implement smart home concept with green technology, while other investors may present it directing more on introducing information technology facilities and etc. However, R10 further explained that, through the experience of developing smart city in the state of Malacca, it is easy for the planning and developing process because of the readiness of the master framework on the Green Concept. According to him, without the master plan it will open to number of interpretation and misperception of smart home concept or any other housing development plan by the Malaysian Government in the future.

The Uniform Building By-Laws 1984 and Housing Development (Control and Licensing) Act 1966 should be revised and inserted with the smart home concept. This is due to the fact that there is a lack of statutory provisions relating to SH in the local statutes regarding housing development. This is supported by R7. R7 also venture to suggest that a provision on penalty and punishment to be added to the Act.

The self-regulator such as the Board of Engineer should play an active role in formulating policy and regulation on SH. According to R7, *"The Board of Engineers has a significant power entrusted by the law. The Board advice the government and the public on the engineering education and accreditation of the programme..... we make the general rule and the rule is determined by the board."*

Other that weakness in policy and law, another constraint to the wide implementation of smart home concept in Malaysia is high purchase price. It is affordable only to just certain people. Therefore, it seems needed to also develop smart home concept in non-elite area so that both group, the elite and ordinary persons can benefit from it. There must also be authority body to maintain and manage the surroundings of smart home area as informed by R7. The surroundings do not only limited to the area adjacent to the house but also include facilities such as field, parking area, lift and so on. For funding purposes to maintain the facilities and surroundings, there should be collection of certain amount from the residents. Local authority is responsible in handling the fund to be segregated to the management body or management committee as needed to maintain the residential area. Therefore, amount of fund collected by the management must be sufficient as reserve. R8 also is of the opinion that major constraint in

implementing smart home is due to the limitation of financial matters and it is related to green concept. Smart home development is seen as unnecessary at present, however it is more or less seen as an extra effort and it just “nice to have” scenario, however, it is a long term effort in terms of liveability.

The research also found that the enforcement of the law in ensuring the quality of equipment and services related to SH is still quite loose. R11, stated that the regulation in Malaysia is slacker compared to Singapore. In Singapore, the installation can only be done by a certified contractor or a professional engineer. They must have be a Licenced Electrical Worker (LEW). He explained, *“I could say it is quite relaxed here. A lot of people can call themselves as a smart home contractor, even they have no knowledge basically. So it is quite easy for any electrician or contractor to pretend they can do and what to do. In Singapore, when we work, we can compare on the two, in Singapore there a little bit more of constraint, they are some project where they require the engineer on the side have license called as LEW however, in Malaysia there is no such requirement.”* Further R11 elaborated the situation in Malaysia and Singapore, *“I know in facilities management in Malaysia, let say in hospital and school when you have somebody the technician to do the maintenance of the generator then they need the license we called it as charge man. These people they have the license but it is hard to get them, they do black market. This is for public building, for maintenance technician, but for installer and contractor I am not aware on this. For us, whether we do work with home owner or UEM, we have never been challenged to show any certificate by the authority.”* However, in Singapore he further explained, *“you have a contractor not in every project, but some project you have to have engineer to have certification called LEW (Licensed Electrical Worker) and then even individual house, before he handed over to the client there is Tenaga Singapore Services (Singapore Power Services) they will send the team to the house. This house will be checked whether the design for example is similar to the design on paper and they will also check every switch to make sure there is no danger. It is the main different between the two countries and in Singapore the process of monitoring is very details.”* From the statement it shows that the level of enforcement and monitoring effort in this aspect in Malaysia is low.

It is contended by the respondent that SH is also about incorporation of energy savings elements. The most common energy saving function available in a normal SH appliances that capable of automatically enable or disable based on the instructions given through actuator or detector. SH tracks the amount of energy used and command it to use less. Based on the study conducted, it is estimated that the energy saving appliances in SH help to reduce one third of the normal cost of electricity bills compared to a normal house of the similar size. Therefore, in order to properly incorporate the energy saving function of SH, it is suggested that the HDA and it Regulations in relation to Smart Home Concept must be improved. R7 is of opinion that this can be done by introducing on the provision on energy saving which is in accordance with the worldwide requests and changes. R7 further suggested that in promoting the energy saving and security initiative, it should not just be implemented in smart home project alone but also to the conventional house. However, there must be an amendment to the housing law concerning the housing construction to include the component of energy efficiency specifications, environmental protection and security and safety features. The importance of implementing energy saving and security has also been articulated through the findings given by Robles *et al* (2010).

Smart home provides advantage to the owner through its capability to make the life convenient, easier and peaceful. Robles and others in their writing states that, systems and tools installed inside the house able to give full enjoyment and peace. The security system is viewed as the most important function in establishing smart home. It provides a monitoring function to ensure the safety of the surroundings and people living in the house. Thus, as the initial stage in making step for compulsory implementation by the government, the status for having all the equipment for energy saving purposes, environmental preservation and security will only be highly recommended (Yeon et al, 2017). Then only in the next phase after community have understood and value the new provision, implementation and changes to the rules and regulations are necessary in order to make it compulsory for everyone to have it in their house.

Each of the criteria belongs to three system should get for license approval and as control mechanism to the housing authority. As an encouragement for home user to maximize the benefit from its implementation, Malaysia also should initiate incentive scheme such as tax relieve or reduction. R8 recommended the new proposal concerning the issuance of building certificate of fitness by the engineer or local authority for the reason that inspection and qualification of the building as well as responsibility and liability must be equally shared by these entities. Moreover, the professional should be protected by professional insurance. However, the disadvantage is that will be the increment of professional fee that will cause additional cost to be bear by the house buyer. Amendment in SDBA is required considering suggestion given by R8 who requires smart home to be more flexible by having the walkway and utility tunnel to enable reparation or renovation when it is needed.

A nationwide implementation and compliance to the uniformed building bylaw is necessary in order to carry out the concept of smart home. At present, only certain states comply with the provisions in the bylaw. At present, there are multiple level of bylaw; federal, state and territory. Due to that reasons the government must have the plan to overcome conflicts or issues arise from the existence of these multiple levels. It is highlighted by R7 that UBBL must have provisions regulating installation of devices that provide services in terms of safety and energy saving. Secondly, UBBL must also address on the guideline for the buyer of home devices and appliances. He suggested that, in ensuring the quality standard is attained for the selling and producing of those devices and appliances, it must be monitored and observed by the authority such as the Power Commission. R7 has also proposed that the appliances quality standards of provisions must be included in the UBBL to ascertain that the international standard of the smart home appliances and equipment are implemented in Malaysia. Thus, it is suggested that, the agreement entered between supplier and Power Commission must be made clear especially on the requirement for quality control of the devices, appliances and equipment of smart home as well as provision guaranteeing its safety.

## **7. Conclusion**

To achieve target on promoting smart home, Barlow and Gann (1998) suggested that smart home must satisfy some criteria. It must:

- 1) Cater for the need of the user,
- 2) Provide three levels solutions comprise of generic technologies,

- 3) Provide basic, compatible “building blocks” for context specific systems (which can be adapted to a wide variety of dwellings)
- 4) Provide personalised systems (tailored to the requirements of specific individuals and households). The system must offer functionality; ease of use; affordable, reliable, maintainable, flexible, adaptable and easy to install.

Until and unless a comprehensive legal framework of SH in Malaysia is achieved to the satisfactory level, the home owner or consumer is not fully protected. Amendment and improvement in law and regulations is comprehensively needed specifically in the following statutes i.e. the Uniform Building By-Laws 1984, Housing Development (Control and Licensing) Act 1966 and its Regulation, the Street, Drainage and Building Act 1974 (Act 133), the Town and Country Planning Act 1976 (Act 176) and States’ Planning Control Rules. Additionally, the quality standards of SH gadget and equipment must be controlled and monitored by the authority to avoid losses and injury to the user/owner of SH.

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