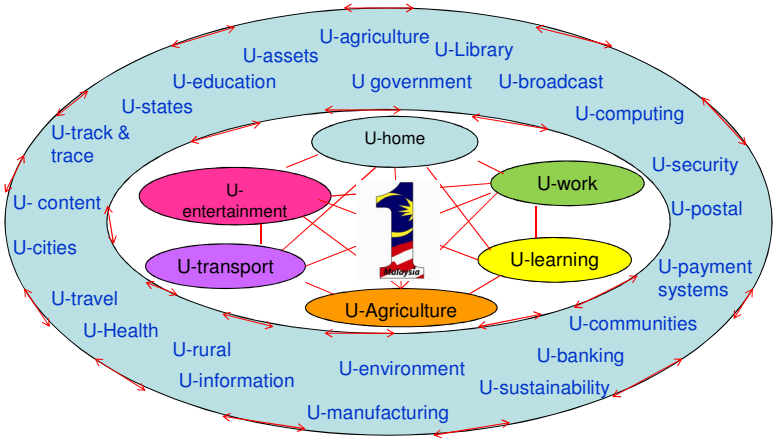

Ubiquitous Malaysia &
The Internet of Things

Public Consultation on UMIT Plan 2011-2015

Dated: 9 September 2010

Kindly forward your comments to the 22 questions in RED boxes below and return by email to UMIT@cmc.gov.my by 10 October 2010. Only replies which state who you are as individual and/or organization with your email address and mobile contact number will be reviewed.

For further enquiries please contact UMIT@cmc.gov.my

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Foreword

a) As we embark on the last decade from 2010 onwards reaching towards 2020, the reality of Malaysia becoming a developed nation, especially in terms of being an advanced nation within the info-communications technology arena takes on a more urgent approach. It is as if all of a sudden, we now realize that time is of the essence in order for us to steer what remaining time we have left to reach the ultimate vision - as if the last ten years going forward may be the grand finale to provide the finishing touches to link up the significant mega-efforts within ICT development of the past two decades.

b) In this respect, it is timely that the Malaysian Communications and Multimedia Commission or MCMC, as the regulator and industry promoter empowered under the Communications and Multimedia Act 1998, comes forth with this Malaysian Consultative White Paper entitled "Ubiquitous Malaysia & the Internet of Things or "UMIT" Plan. Having first started its own existence at the turn of the 21st century, MCMC spent its early years of infancy basically developing the subsidiary rules, regulations, directives and guidelines. Thus the earliest five year Master Plan was the Framework of Industry Development or FID from 2000 to 2005. As the telecommunications, broadcasting and multimedia industries were converging quickly due to the advancement of broadband, MCMC conceptualized the MyICMS 886 strategy at the end of 2005, which was intended to take us into the next five years, to funnel the necessary infrastructure and resources into broadband to put the goals of the National Broadband Plan into reality.

c) As we now move closer toward 2020, there is a need to reflect the reasons behind building the requisite broadband infrastructure with such tenacity during the MyICMS 886 era. We need not look back too far as our core values and the National Policy Objectives as embedded under the Communications and Multimedia Act 1998 remain unchanged. Firstly there

is a need to establish Malaysia as a major global centre and hub for communications and multimedia information and content services. In this respect, having broadband is just the beginning, but with this primary objective of being a major global hub, therein sets the challenge for the nation's ICT planners as a whole to carve out a niche for ourselves. Secondly, just how well we succeed to grow and nurture local information resources and cultural representation that facilitate national identity and global diversity will become the litmus test for our civil society. In addition, the ability to create conducive environment for all thereby ensuring an equitable provision of affordable services over ubiquitous national infrastructure would be of paramount importance. Last but not least, there must be an abundance of robust applications for all in Malaysia so that there is a sustainable value added proposition for us by the year 2020 under a 1Malaysia theme.

d) Be that as it may, ironically, much of what is desired as stated above lies within the concept of the Internet of Things, which has now been recognized by the International Telecommunications Union (ITU) as a universal phenomenon synonymous with ICT services and devices linking up to the Internet to enable economic development in various parts of the globe. East Asia alone has seen a surge in government initiated Internet of Things (IOT) ecosystems with the Koreans, Japanese, Taiwanese and the Chinese each having major programs in this arena. It is now apt for mooting and implementing the Ubiquitous Malaysia & the Internet of Things, a concept which although may start off initially as a dream, but if we plan and walk that dream together, then gradually there will be sufficient momentum created. After building the requisite broadband infrastructure, there is now the need for sufficient like minds to use the same for the betterment of our own lifestyles as well as for national development. This remains one of the biggest ICT developmental challenges for the next

decade: HOW BEST TO DEVELOP A COMMON UBIQUITOUS ECOSYSTEM RIDING ON INFO-COMMUNICATION TECHNOLOGY FOR ALL IN MALAYSIA.

2) Ubiquitous Malaysia & the Internet of Things

a) Introduction and Definition

i) Ubiquitous Malaysia

(1) Our daily lives nowadays depend very much on the environment in which we live and operate in. Much of our daily 24 hours are usually spent either at home, in the work place, at play, in prayers or travelling. In this respect, not much has changed for centuries as the capacity to work, play or travel is dependent on the surrounding factors including costs of living, time taken to achieve each chore and one's own tenacity to dictate the pace of life by doing as much or as little as required.

(2) No doubt that some of us prefer to maintain our way of life without having the necessity to make any changes but on the whole, wouldn't it be nice just to be able to do or achieve as much as we can to live life to the fullest?

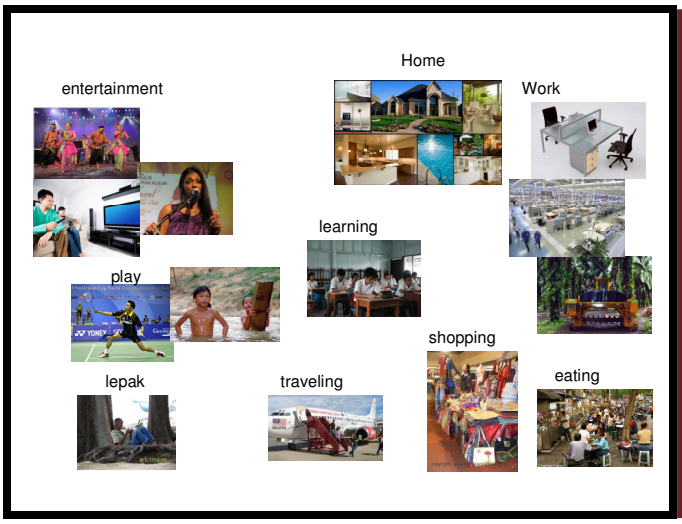
(3) In order to achieve as many things as possible within a day, a week or even a month, we need to be present almost everywhere at once or be omnipresent. This is the meaning of the word "ubiquitous"[1].

(4) This paper propounds that Malaysians on the whole, regardless of race or religion, are capable of accepting changes to their current way of life, albeit some slower than others, through the advancement of technology especially if the policy makers are able to create the right platforms and ecosystems to provide a ubiquitous way of life for the masses via proper ICT tools. This paper also

[1] "ubiquitous" means being present everywhere at once or being omnipresent.

assumes that, provided that the next layer of intelligent ICT infrastructure to be built is one which is relevant to the needs of the community and is sustainable, the Malaysian society is on the whole sophisticated enough to be embraced into a ubiquitous way of life.

(5) Examples of the impact of ICT on the daily lives are prevalent almost everywhere but on the whole they are not yet linked together on a expansive nationwide scale, simply because the reaches of the Internet were not available and thus were not utilized in many parts of the country for the last two decades. However, as we are reaching a situation whereby household broadband penetration is fast approaching national targets, there will exist the economies of scale whereby if the planners and policy makers are willing and able to create such an ecosystem or systems comprising of various ubiquitous lifestyles interconnected to one another via the Internet in a way which is truly suitable for and can be identified proudly as Malaysian, then just perhaps it would become worthwhile. This is the aspiration and the challenge in building Ubiquitous Malaysia & the Internet of Things.



Wouldn't it be nice to be able to link as many of the current lifestyles up so that we can all achieve more within a day, a week, month, year and a lifetime?

Q1. Although change may come slowly, do you think that Malaysians on the whole, including those in the rural areas, would be able to appreciate changes to their current way of life step by step if we are able to deliver the right combination of ICT services which are relevant to their needs? Name some examples, including for instance booking airline tickets online, etc, where change would be inevitable.

Q2. If 67% of Malaysians now live in urban and semi-urban areas, do you think that it makes sense for us to implement Ubiquitous Lifestyles projects in such areas first and gradually let the impact of change be spread across the rest of the country?

Q3. Can we further narrow the digital divide using Ubiquitous Lifestyles projects together with the right basic infrastructure rather than providing basic broadband infrastructure alone?

ii. The Internet of Things

The phrase the "Internet of Things" (also known as the Internet of Objects) refers to the networked interconnection of everyday objects. It is generally viewed as a self-configuring wireless network of sensors whose purpose would be to interconnect all things.

In a nutshell, if all things or objects can be labeled with a distinct number, and all these numbers can be identified via the Internet, we would then be able to have much more applications on the Internet and a massive transformation of the way in which we plan and organize our society. The notion is that simple as its application is difficult. Take for instance if all boxes, phones, watches or parts of cars are equipped with minuscule identifying devices, daily life on our planet will undergo a transformation. Supermarkets will not run out of stock on supplies or wasted products will no longer exist as we will know exactly what is being consumed on the other side of the globe. Theft will be a thing of the past as we will know where a product is at all times. The same applies to parcels lost in the post.

If all objects of daily life, from chocolates to an airplane, are equipped with radio tags, they can be identified and managed by computers in the same way humans can. The next generation of Internet applications (IPv6 protocol) would be able to identify more objects than IPv4, which is currently in use. This system would therefore be able to instantaneously identify any kind of object. [2]

The Internet of objects should encode 50 to 100 trillion objects and follow the movement of those objects. Every human being is surrounded by 1,000

[2]The above two paragraphs are taken from June 2010 Wilkepedia definition of the Internet of Things

to 5,000 objects[3]. It seems that we are standing on the brink of a new computing and communication era, one that will radically transform our corporate, community, and personal spheres. With continuing developments in miniaturization and declining costs, it is becoming not only technologically possible but also economically feasible to make everyday objects smarter, and to connect the world of people with the world of things[4].

Building this new environment however, will pose a number of challenges. Technological standardization in most areas is still in its infancy, or remains fragmented. Not surprisingly, managing and fostering rapid technological innovation will be a challenge for governments and industry alike. But perhaps one of the most important challenges is convincing users to adopt emerging technologies like RFID. Concerns over costs, privacy and data protection are widespread, particularly as sensors and smart tags can track a user's movements, habits and preferences on a perpetual basis. Fears related to nanotechnology range from bio-medical hazards to robotic control. But whatever the concern, one thing remains clear: scientific and technological advances in these fields continue to move ahead at breakneck speed. It is only through awareness of such advances, and the challenges they present, that we can reap the future benefits of a fair, user-centric 1Malaysia and global Internet of Things.

[3] **^** Waldner, Jean-Baptiste (2007). *Inventer l'Ordinateur du XXIeme Siècle*. London: Hermes Science. pp. p254. ISBN 2746215160.

[4] ITU INTERNET REPORTS 2005: The Internet of Things

iii. Intelligent Malaysia

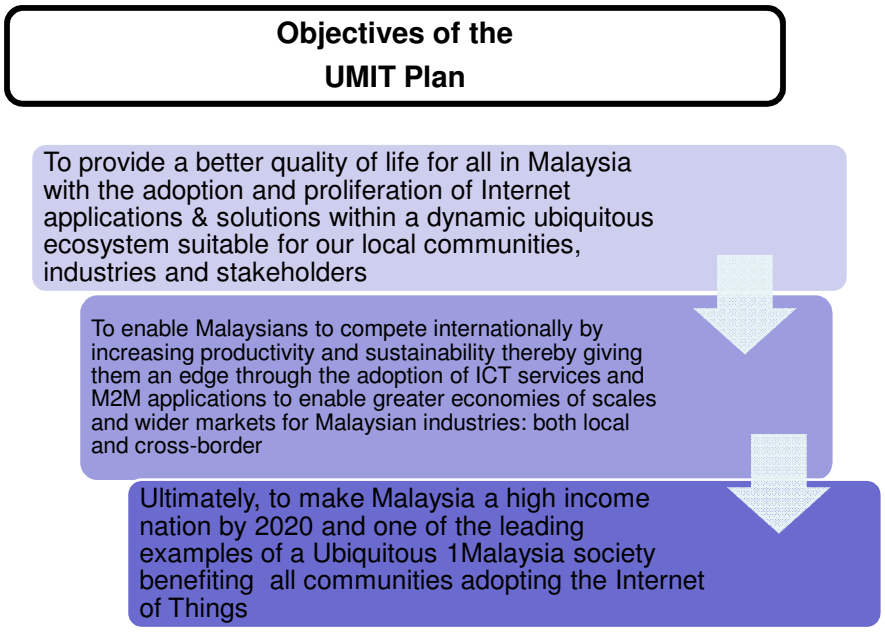
To quote the International Telecommunications Union (ITU) Internet Reports 2005 – The Internet of Things, "It would seem that science fiction is slowly turning into science fact in an 'Internet of Things' based on ubiquitous network connectivity. Today, in the 2000s, we are heading into a new era of ubiquity, where the 'users' of the internet will be counted in billions and where humans may become the minority as generators and receivers of traffic." Therein lies the challenge within the above scenario whereby in order to build an intelligent Malaysia we have to confront and engage the Internet, with its limitations and strengths altogether and build for all in Malaysia something which is relevant and can be sustainable for all communities.

Whatever system which is created or evolving out of our National Broadband Infrastructure, the intelligence is only to such extent as created by its designers. If done in a cohesive ubiquitous manner there is greater possibilities of it being more intelligent than others. Note that intelligence is not something general in nature[5]. To design an intelligent district, township, city or state is not the same as multiplying the same concepts and designs for an intelligent building. As for an intelligent Malaysia, an intelligent national system has to be tailored towards certain well defined Malaysian objectives. A Malaysian socio-economic community with its wish lists must exist, within which the intelligent system can interact and choose to be relevant. However, the practical need to identify specific priorities is a necessity. Henceforth MCMC consciously has decided to align as far as possible our objectives and deliverables of the UMIT Plan to run in tandem with the RMK10 programs as well NKEA initiatives outlined by PEMANDU. In this way, we aim to work together and share our national broadband

[5] There are many definitions of intelligence. A person that learns fast or one that has a vast amount of experience, could be called "intelligent". However for our purposes the most useful definition is: the systems comparative level of performance in reaching its objectives. This implies having experiences where the system learned which actions best let it reach its objectives.

infrastructure as well as our next generation intelligent infrastructure, for all who share our core values and in building up 1Malaysia.

b) Objectives of UMIT



i) Creating a better quality of life within a dynamic Ubiquitous ecosystem

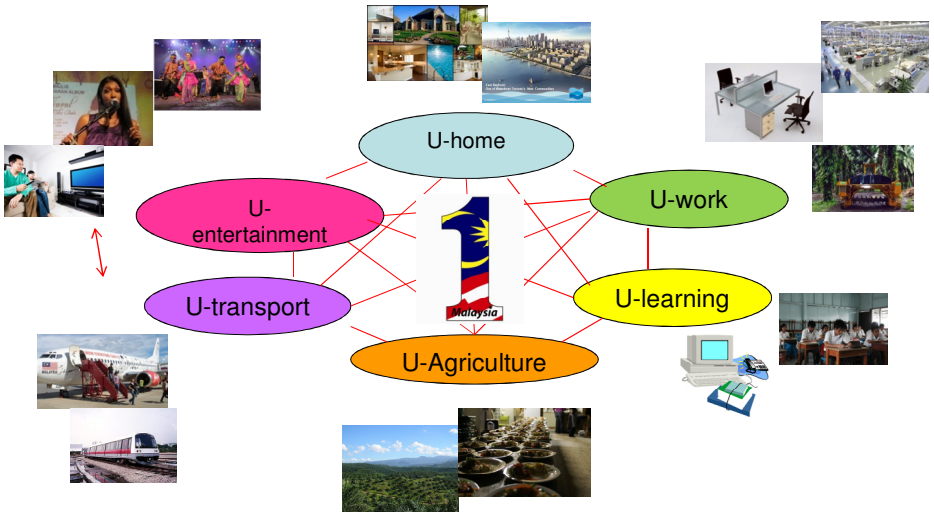
(1) If there is anything which can be introduced to a typical village or rural community whereby the local population will accept and without realizing it, adapt and change their way of life for the better, most likely, it has to be ICT related. Social behavioral practice, whether as a result of better content on the local television or via the Internet, and whether they can do their shopping or arrange for tickets online, can have a direct effect on the benefits which members of society derive from ICT. However, ICT does present

potential damages which may exert a negative influence. The same is true if one assumes technology to solve all social problems (although problem solving may often be related to technological change in one way or another).

(2) We need to be guided by the principles that adoption of the Internet within the communities may not make any sense for the laymen unless there is a benefit for them to use and eventually to pay for such services. However in order for the communities to recognize the benefits for a Ubiquitous lifestyle or ecosystem, there must be a sense of belonging. As such, in designing a Ubiquitous ecosystem, very often what matters most is relevancy and the buy-ins. However, the situation is not as simple as just asking the laymen about what they want coming out from ICT. Very often, the benefits can only be ascertained after the ecosystem exists whereby the masses can then begin to appreciate it[6]. In the sense, the philosophy behind most macro economic planners still is apt - supply has to come before demand and the planners have to create the platform first to test out the relevancy and get the buy-ins. Change comes slowly but in a sense, if there are greater concerted efforts to promote the adoption of ICT services which can only come with public-private sector collaboration, change has to happen in a sustainable manner.

[6] MCMC intends to be guided by the principle of using ICT to bring greater socio-economic impact to the communities. They key words are relevance and sustainability, via pilot projects.

Creating ubiquitous Ecosystems or U-Ecosystems which are relevant and sustainable to link up with current lifestyles



Q4. In most free market economies, it is the middle class population which would be the engine creating the greatest economic growth and any new Ubiquitous Malaysian Ecosystem to create a better quality of life should not only cater for the rural poor but also be mindful of the needs of the middle class. Would you agree on the above assessment and how should we link their relevancy and sustain the wants of a future generation of middle class for a better quality of life for the year 2020?

ii) Competing Internationally using ICT through increased productivity and sustainability

(1) Reality strikes us in a sense that in the competitive world of business and free market economies, we need to design a Ubiquitous system

which not only discourages complacency, but more importantly, facilitates increased productivity and sustainability. Looking from the viewpoint of a typical small or medium sized corporation, trying to increase productivity using ICT very often does not come free of charge as a business case has to be defined before there is a willingness to spend the investment amount on ICT services.

(2) However, in many instances, investment into ICT services may be a case of short term savings versus long term benefits. This is where if the initial costs factor seem to be the main stumbling block, the government perhaps has a role in facilitating a ubiquitous ecosystem which enables the participation of the masses thereby creating the economies of scale. Sustainability of the ecosystem then becomes the next biggest issue for whatever the initial capital expenditure required for building the Ubiquitous ecosystem, it still remains usually a one-time affair but the success or failure of the project very often lies in whether the local business community accepts and use the system to maintain its sustainability.

iii) Boosting Economic Growth

(1) Economic growth using ICT as an enabler seems to be one of the best value propositions which transcends across race, religion or creed. Growth can be sustainable if we can value add to the extent whereby there is further contribution towards the Gross National Income or GNI. Henceforth MCMC's priorities would be to determine or ascertain key economically value added growth areas which will then be the basis for building up our key Ubiquitous ecosystems.

(2) As the nation moves into the constantly changing and dynamic world of ICT, what remains important to realize is that economic growth can only be sustained if it incorporates private sector participation. As such MCMC's role is in facilitating the growth and in tandem with

the National Kea Economic Areas identified by PEMANDU, a few mega-ecosystems including transport & logistics, agriculture and the telecommunications which will be the focal pillars for development into Ubiquitous ecosystems. In this respect, the co-operation of the relevant government agencies is often seen as the key ingredient to ensure success in such facilitation process.

Q5. How should the government facilitate to provide the right platforms and create the right Ubiquitous Ecosystems together with the private sector? Should MCMC take on a more aggressive role in promoting ICT services on the Ubiquitous Malaysia platform?

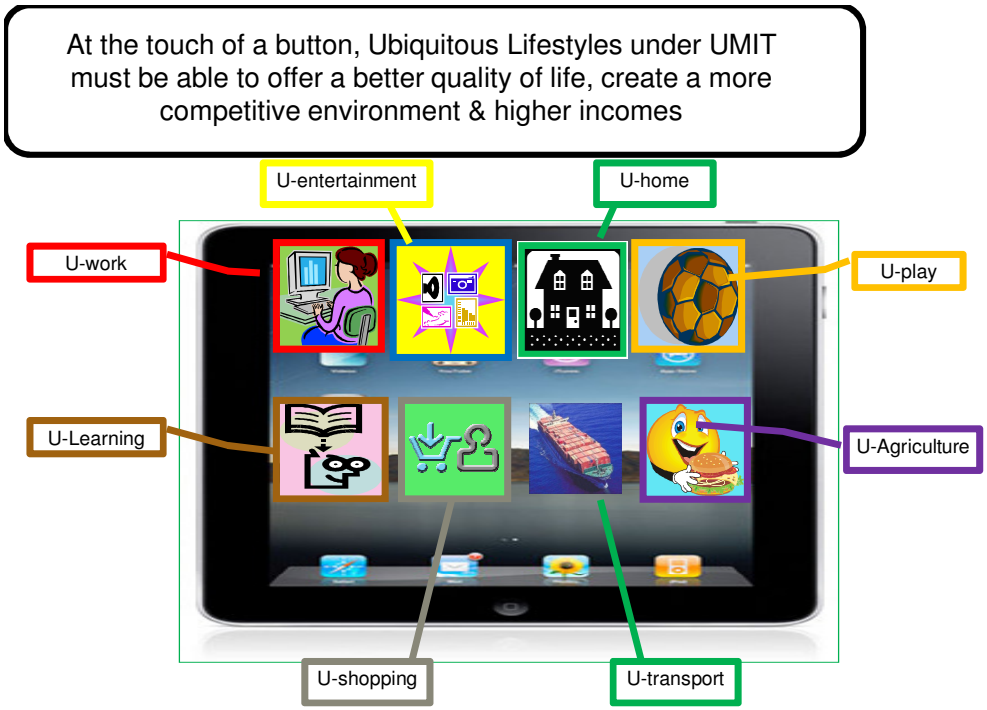
Q6. How do we create the Ubiquitous Platforms to compete internationally? Please quote foreign examples if possible.

iv) Enabling higher income for the population

(1) If the above objective of increasing productivity and economic growth comes into being, higher income may be a natural consequence. The question is how best to develop a Ubiquitous Ecosystem such that those who benefit most and enjoy higher incomes would be those that succeed in living, breathing and experiencing the ubiquitous lifestyle, thus ensuring them not only a better lifestyle but also more sustainable cash flow to afford new ICT services and content. In this manner, it would encourage by example those left behind to catch up and thus not be left behind.

(2) MCMC has to be mindful that notwithstanding the need to build Ubiquitous ecosystems from those in the urban areas, there is an urgent need to deliver suitable sustainable Ubiquitous ecosystems in the sub-urban and rural areas as well. Higher income comes about in

a natural manner wherein if we take the purchasing power of parity into consideration, and factorize the costs of living discrepancies between rural and urban, ICT remains one of the best enablers to bridge the digital divide.



Q7. How should we balance the three UMIT Plan objectives of having a better quality of life, creating a more competitive environment and higher incomes at the same time? Is ubiquity the key?

c) Implementation strategies for creating sustainable Ubiquitous ecosystems

i) Common intelligent Infrastructure systems

(1) To design a futuristic nationwide ICT ecosystem it is essential to get the macro view or horizontal perspective correct of what one visualizes as the ICT lifestyle in the year 2020. From the onset for

national planners, a macro view of the national requirements and community needs can be all included in some form of ubiquitous intelligent infrastructure such that it becomes easier to progress thereinafter in terms of data storage, IPV6 numbers, bandwidth, PKI, spectrum needs, data security coverage and technical standards as a whole. In this respect, 5 distinct intelligent infrastructure has been identified, namely:

(a) National EPCIS (NEPCIS) for supply chain links, together with IPV6 and industry specific sub-EPCIS models – potential to link up to as many as 50,000 SMEs and other outlets within the country and 1,000,000 others outside;

(b) Ubiquitous Payment System - National Trusted Service Manager (TSM) for NFC/Payment Systems with PKI authentication,– the crucial payment infrastructure which will be secured and affordable for all e-payment transactions within a much greater ecosystem than previously attempted which can be linked to serve the payment side for the NEPCIS above and other national Layer 3 platforms below;

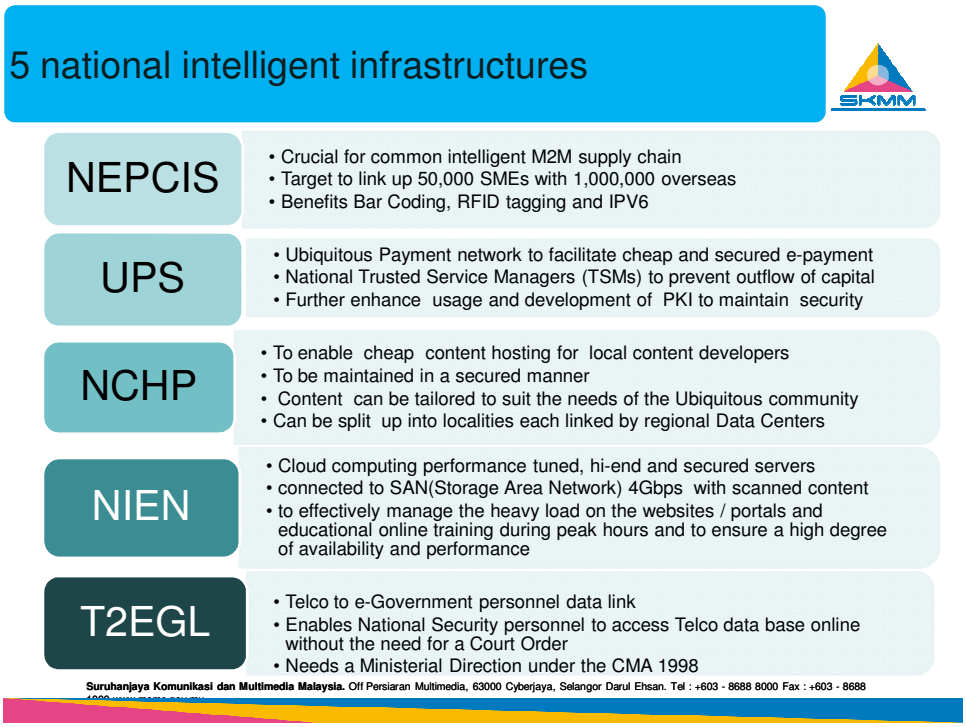
(c) National Content Hosting Platform (NCHP) for linking up local communities as well as to provide local content providers a suitable platform for dissemination of their creative content – the NCHP will aspire to be a virtual home ground by choice to be populated, maintained and managed by local content providers and audiences;

(d) National Edu-Info Network (NEIN) – a combination of information and educational objectives managed using cloud computing techniques to balance the heavy load on the websites / portals as well as the educational interactive online network between schools and training institutions during peak hours and to ensure a high degree of availability and performance; and

(e) Telecom to E-Government Link (T2EGL) - U-personnel security data base linking up selected licensee data base to MCMC which will then create secured linkages to other e-government data base including PDRM, LHDN, JPN, KDN, etc.

Q8. Do you think that the above five key intelligent infrastructures are relevant to the needs of a future ubiquitous society for 1Malaysia and what are the primary issues versus the benefits from the viewpoint of providing such infrastructure?

Q9. Are there any other intelligent infrastructure which you think may be equally relevant and who are the stakeholders?



(2) Note that all five intelligent infrastructures above has to be interlinked and the extent to which one intelligent infrastructure can be safely interlinked to another will remain the test of how efficient and competitive our lifestyle can be changed ubiquitously. Synergy must be created and thereafter such a widened ubiquitous ecosystem can be further linked in the future to similar international platforms elsewhere in the future. A good example would be the Malaysian EPCIS infrastructure which can then be linked to similar ones being developed in Hong Kong, China, USA, European and many other jurisdictions along the worldwide supply chain ecosystem.

(3) Once the above common intelligent infrastructure has been built to conform to international standards and tested, it becomes essential to start building up specific sub-Ubiquitous Ecosystems to meet the needs of the industry and community. A sub-Ubiquitous platform for the postal & courier industry can easily co-exist, for instance, riding on the already established NEPCIS infrastructure. Thereafter, for projects which are in need of funding there is the possibility of using Ubiquitous Lifestyle Application Fund (ULAF) which MCMC will initiate by the end of 2010. Nevertheless MCMC will need to work closely together with the local community and the 1MITEC to gauge the supply and demand equations for building up U-Ecosystem projects.

ii) Flexibility in Building Ubiquitous Ecosystems

(1) In order to create the relevancy and the sense of ownership or belonging amongst the local communities, it is important that the local people have a chance to have their say. In this respect, the implementation strategy has to be flexible in order to accommodate

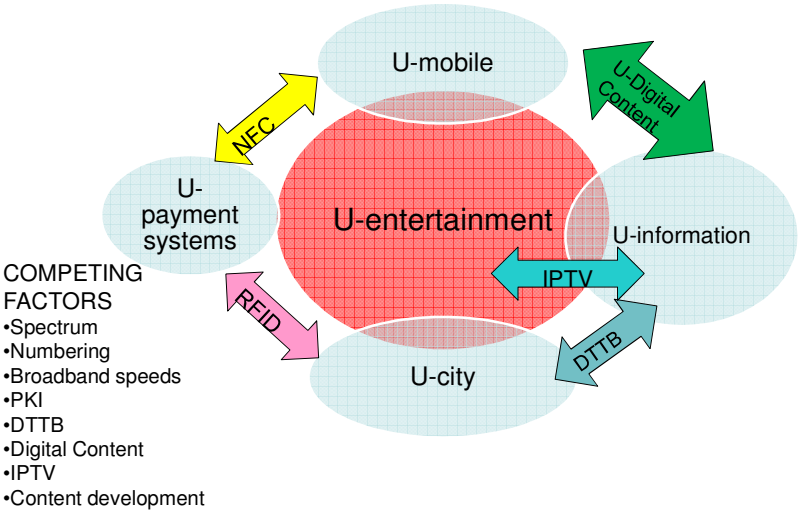
differences in opinion and preferences such that it remains relevant to the community.

(2) By and large, notwithstanding the time factor, MCMC would prefer to engage in pilot projects first, especially to "test" the various soft skill factors including relevancy, community sense of "buy-in" and sustainability.

(3) Below are three examples of developing a Ubiquitous Ecosystem to support local lifestyles taking into account various competing factors:

(a) Example 1 – U-Entertainment Lifestyle

Example 1: Creating New Growth Area Projects
U-entertainment Lifestyle to support local preferences, competing factors and lifestyles

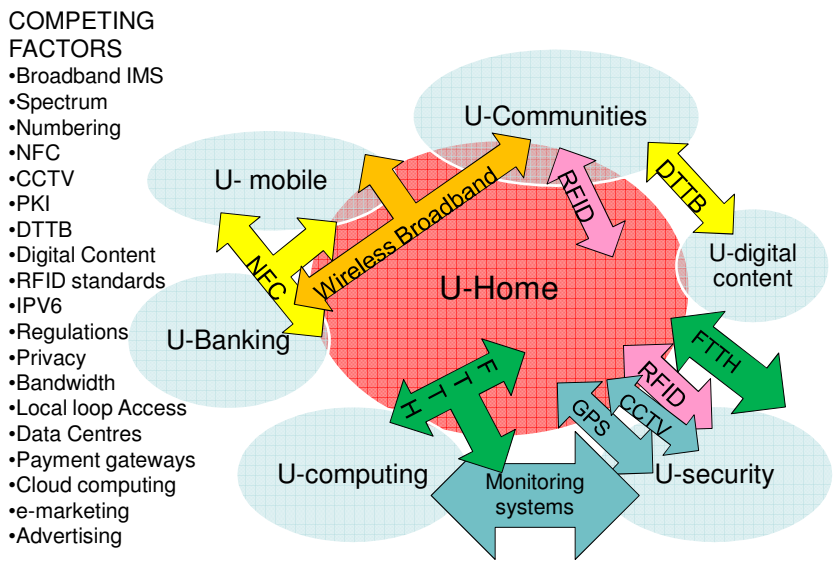


The development of such U-entertainment lifestyle would only be relevant if there is sufficient content of the type which is popular for the local audience. One the one hand Village A may be keen to watch old movies or the daily news, which can be downloaded cheaply via the Internet. However, Village B may be a new township whereby the

younger generation prefers to watch the latest movies and download pop songs and with online games to top it up. Thereafter the ubiquitous ecosystem must be capable of linking up on towards payment systems such that with the press of another button or touch screen spot, instantaneous payment or pre-advice can be completed in a safe and secured manner without much hassle. There are also other preferences including the availability of new and potentially cheaper modes of delivery for entertainment, including IPTV, Peer2peer, DTTB, Satellite and mobile TV. Other competing factors include the size of the community and the location. Question to ponder is whether are it is in a city whereby high speed fiber is available or should the planning be for a more modest broadband speed via wireless broadband. Hence, besides room for local preferences which has to be taken into consideration, there is a role for MCMC to take other practical factors into account.

(b) Example 2 – U-home Lifestyle

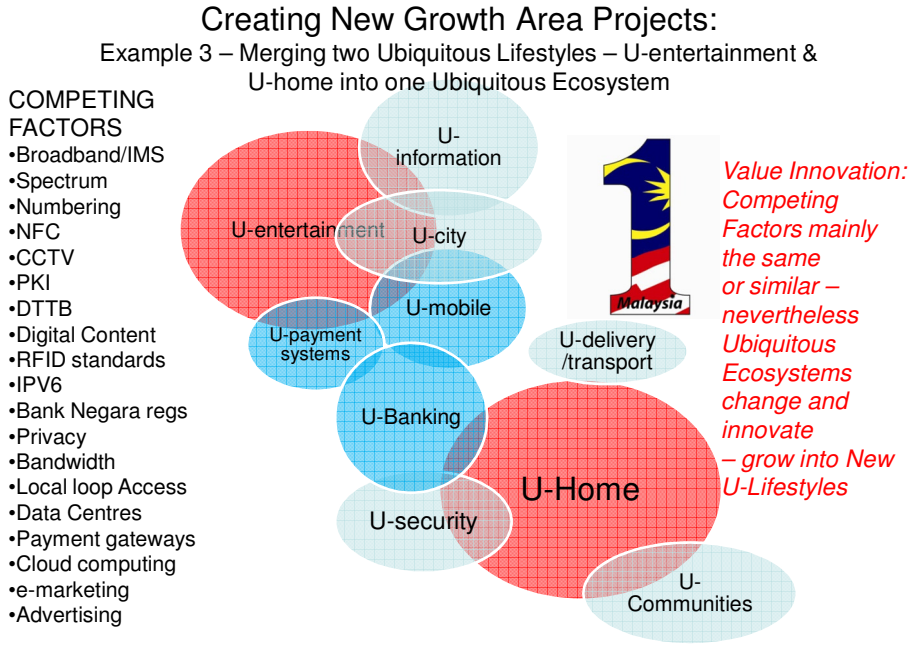
Example 2: Creating New Growth Area Projects :
U-Home Lifestyle



Creating Ubiquitous home projects really have abundance of choice, depending on the location and the preferences of the local communities. Projects of this nature could start off relatively small, just to cater for a small village, as in the case of a small pilot for an indoor environment as in a community centre. On the other hand, it may be the preference of the locals to build a wireless broadband system which would cater for the needs of the kampong community whereby security, digital content and information about agricultural related items and payment systems are the priority.

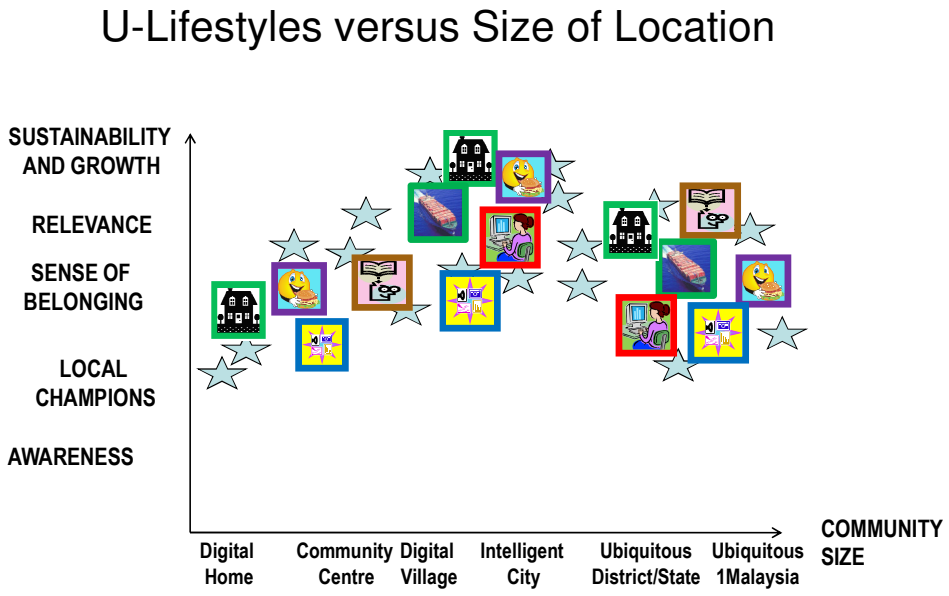
Be that as it may, the essence of giving them something in which there is a sense of belonging is essential.

iii) Matching U-lifestyle projects into U-ecosystems



In terms of sustainability of Ubiquitous Lifestyles systems, there may be a stage whereby size does matters, and in this respect what is needed would be to combine two Ubiquitous lifestyle projects into one bigger Ubiquitous Ecosystem, so that there is greater sustainability with economies of scale. Herein lies the challenge as to determine the optimum size and whether it is such that the "bigger is better" but in general, MCMC is aware of the need to balance between the expectations of the community and the practicality of the project. By combining two ubiquitous lifestyles, for instance, the same fiber cable can be justified to provide not only digital content, but also be the backbone for cloud computing, payment and networked security systems. In this respect the competing factors do not necessary increase proportionally when two Ubiquitous lifestyles have been combined into one. There may only be another fractional technical aspect or competing factor to consider and there may also be greater synergies. The only main change is in the objectives and desired social outcome.

On the other hand, too large a project would require a longer time span and of course greater financial resources. However, suffice to mention that with the exception of metropolitan areas including Greater KL, Penang and Johor Bahru, most of the other districts, and even certain smaller states would be ideal a size for the time, effort and expected results to come. The main criteria nevertheless would be whether such a project would fulfill the objectives of UMIT as stated above.



3) The six UMIT priority projects

a) U-Transport & Logistics

– Making Malaysia one of the top 5 in the Asia-Pacific container track & trace business

i) Concept

(1) Malaysian seaports are facing increasing competition from ports in neighboring countries in term of not only freight charges but also in terms of efficiency and quick turnaround time. As in many other countries around the region, the key towards quicker and more efficient transport and logistics system lie in better collaboration between the logistics companies, local port authorities, bonded zones and the customs organizations around the world. In this respect, new ICT technologies have always been identified as one which could make a difference. Using ICT as an enabler, the objective is to link up as many bonded zones, free zones and ports under one ecosystem, thereby creating greater economies of scale by linking up as many of the stakeholders as possible via the creation of a synergistic platform for cross border standardization, certification and type approval. The key to it lies within the tracking of containers using RFID and the need to maintain an EPCIS platform for the entire supply chain system.

(2) An ecosystem is needed via a secured, national EPC-Global Information System (NEPCIS) to be maintained by the National RFID Engagement Centre to facilitate supply chain links with at least 200,000 SMEs, both local and worldwide. In this respect, sub business models including those for postal and courier services can be integrated to link up by EPCIS to increase not only trade facilitation but also other reaches and business models of the delivery system. This has to be done in a secured manner for ubiquitous RFID and M2M applications to achieve greater economies of scale and greater usage of national broadband infrastructure. In this manner not only containers but even boxes and items can be tracked using RFID and other technologies from not only bonded zones and free zones but also from port to port. It is envisaged that Taiwanese ports will be taking the lead but Malaysia will be working hand in hand with the Taiwanese as well as other like minded countries in the Asia-Pacific including Japan, China, Thailand, Hong Kong and Korea over the next five years. Within the next two years, RFID container tracking would commence commercially from factories in places like Pasir Gudang and Kulim to Malaysian ports

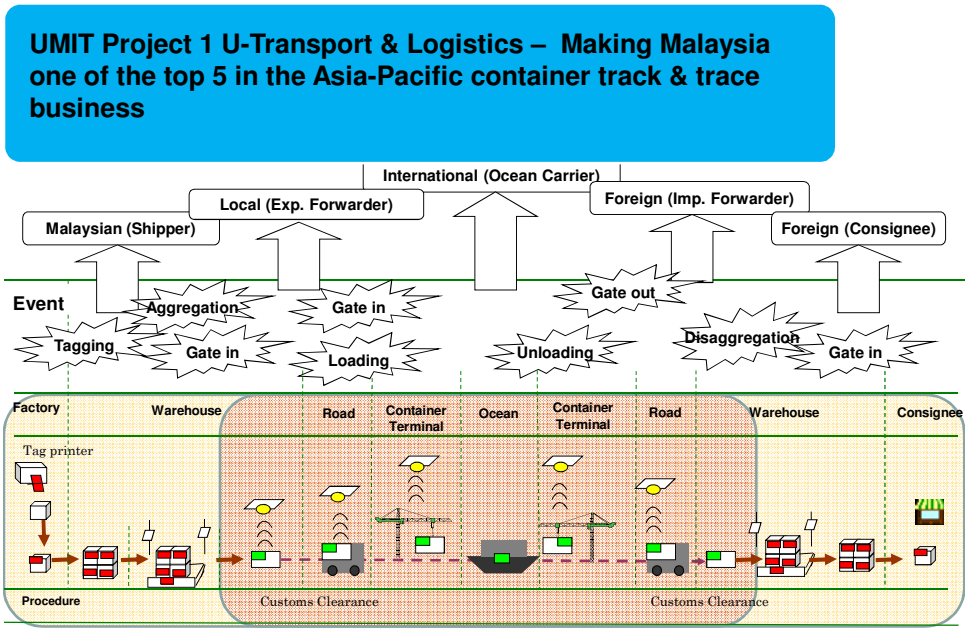
before being continuously tracked to Shanghai and Kaoshiung ports. This would greatly enhanced container security besides increasing efficiency and trade facilitation.

(3) In this respect, it is proposed that in order to provide further value added usage of our national broadband networks and data centers, an amount of RM20 million from the government may be required for last 100 meters intelligent infrastructure costs nationwide but this has to be matched by private sector funding of at least RM 150 million in order to build up towards this key Ubiquitous Transport ecosystem. The project however which would also greatly increase the number of active M2M services transactions by at least 20 million transactions per year[7] arising from port RFID track and trace. This project has been recognized by NKEA E&E Labs as being of prime importance to provide the necessary national platform for the Malaysian E&E sectors which would greatly encourage the manufacturing of RFID equipment by Malaysian companies with an estimated USD245 million contribution towards GNI over the next ten years until 2020.

Q10. Cost and efficiency of transport and logistics is one of the most important factors in determining a choice of location for multinational corporations. Should the government lay out further M2M infrastructure to support trade facilitation and increasing efficiency at customs bottlenecks using our broadband infrastructure and data centres as backhaul?

Q11. What other transport & logistics project would you consider as priority to put Malaysia on the map as a world leader, if any?

[7] Calculations based upon estimated data transfer between shippers, port authorities, customs and payment gateways - MCMC



ii) Goals

(1) The objective of this U-Transport & Logistics project is to increase efficiency of customs operations at the various key entrance and exit points thereby reducing bottlenecks and on the whole increasing trade facilitation thus to make Malaysia one of the most competitive countries in terms of supply chain management practices.

(2) In the process, certain targets can be ascertained[8], and would lead to measureable increases in Gross National Income of more than US$200 million leading up to 2020.

(3) We have to assume that it would be best to start off first using RFID and other sensor networks for a domestic model within our borders first. Henceforth it is a goal for us to have the waiting queue reduced by at least 30% with the introduction of RFID. Thereafter we shall be

(1) [8] based upon estimated figures done in collaboration with the NKEA Labs

taking the lead in terms of cross border RFID container tracking. In this respect, the target is to have at least the ten biggest sea ports in Malaysia as well as the critical free zones and bonded zones to be RFID compliant.

(4) Last but not least, it is the wish that within the next two years, the Royal Malaysian Customs may find the new RFID system to be indispensable whereby provided the costs can be kept at a minimum, the entire national system is then supported by mandatory requirements to use such system for the benefit of all.

iii) Implementation Strategy

(1) Malaysia was one of the first few countries which started container tracking using RFID way back in 2004. Technical trials were done at Johor Port using an internal tracking model within the port using RFID for locating containers. Since then, Malaysia has now taken greater prominence in terms of container tracking with the introduction of ISO 18186, a new Malaysian-China effort.

(2) From 2011 to 2015, the country should move into the commercial stage using the RFID technology to implement the same for the local scenario between local bonded zones, free zones, ports and other potential “bottleneck” spots. Value added propositions will very soon appear as in many cases when port authorities and regulators such as customs organizations start changing the operating manuals to accommodate RFID data. This will ensure that there is positive value added contribution to the clearance operations and measure the improvement in efficiency, time and costs savings.

(3) A Steering Committee needs to be established within the government with active participation of Kastam, Port authorities, Ministry of Transport, MCMC and other relevant agencies. The idea is to get this Steering Committee to monitor the progress reports from the implementing agencies and clear any obstacles or expedite matters in general.

(4) It is envisaged that our Royal Malaysian Customs may look at possibly mandating RFID usage depending on success of this project within

two years.[9] The costs of maintaining a track and trace system has always been a major factor but there is no doubt that the benefits are well accepted within the industry. However, the costs should go down significantly to such levels which is acceptable and a move towards mandatory usage would greatly enhance place Malaysia as one of the top tier one countries in the world in RFID container track and trace and bring about great changes in clearance procedures as well as to bring down costs due to economies of scale.

iv) Implementation Table with KPIs for U-Transport/Logistics

Indicator Type	Stakeholders,	Item	KPI 2011-2015	KPI 2016-2020
Project Indicator	**ICT Stakeholders** Backhaul broadband ISPs, Systems Integrators, RFID tag manufacturers, RFID Reader manufacturers, Data Centers, PIKOM, SIRIM,	Number of seaports, bonded and free zones installed with RFID equipment, feeding data to SMK of customs	Top 10 seaports	Remaining feeder ports
			Top 5 bonded zones with congestion	Remaining bonded warehouses, zones, etc
			Top 5 free trade and industrial zones with longest queues	Remaining free zones, etc
Project Indicator		Number of TEUs which were tagged	Tagging of transit and trans-shipment	Mandatory tagging of

[9] Further justification includes the fact that Taiwan has already mandated usage at major Taiwanese ports and Singapore, China, USA and EU planning of mandating by 2012. In short, container tracking using RFID would be one of the main M2M services worldwide within the next 2 years.

			containers - 1 million TEUs per year	containers
Result Indicator	**Enabled Stakeholders** Customs, MOT, Ports, Port Authorities, FMM, Logistics Companies, Shippers, other custom authorities overseas, shipping liners, Airports, Haulers,	Increase in logistics efficiency @ ports, bonded , free zones Efficiency to be measured in terms of time savings & TFP	20% time savings TFP increase by 0.05	
Result Indicator		Increase in customs efficiency @ ports, bonded , free zones Efficiency to be measured in terms of time savings & TFP	35% time savings TFP increase by 0.05	
Result Indicator		GNI	US$50 million	US$195 million

b) U-Agriculture

Internationalization of JAKIM's trademark in terms of eHalal Trace and Trace Certification

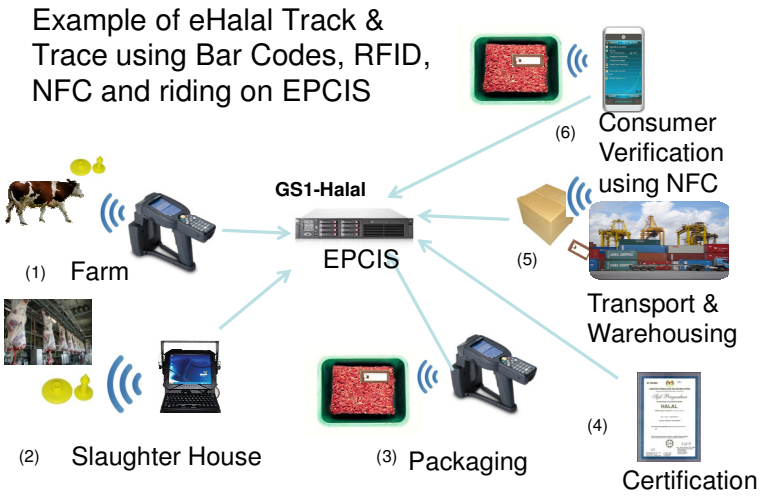
i) Concept

(1) Malaysia has reached a stage in its economic development whereby it can position itself to be a world leader in the production of Halal Food. In this respect, we have a good reputation as being a moderate Muslim nation with our Jabatan Kemajuan Islam Malaysia or JAKIM being highly regarded overseas as having high standards for Halal Food. By participating in this eHalal track & trace system, it would mean that Malaysia, working closely with international RFID standards body GS1 International, will then be able to take the lead in developing a worldwide eHalal Track and Trace solution using the EPCIS protocol system and being one of the first countries to set a new benchmark in EPC-Global Halal standards.

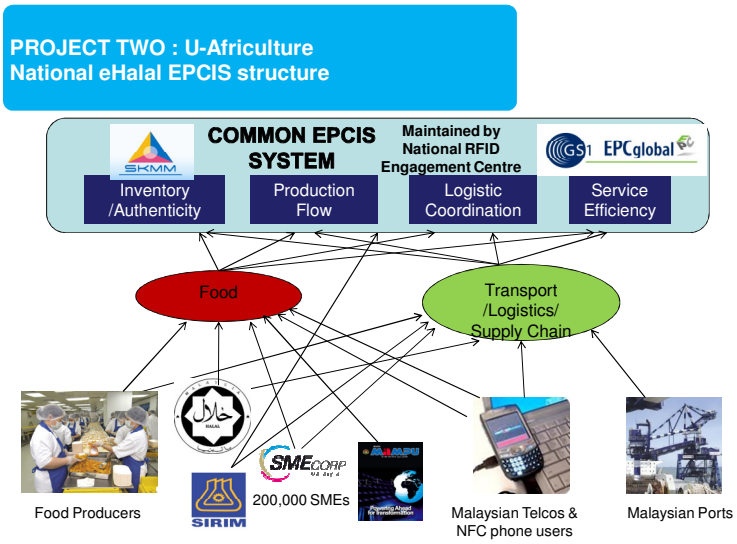
(2) In the meantime Jakim has a challenge to provide a technical solution to maintain the "guilt" free concept for Halal food because even though the food item may be certified as Halal, nevertheless, if the journey from the food producer after certification to the consumer is tainted by contamination with non-Halal food items then the Halal food item itself becomes no longer Halal. The strict observance by Jakim has won the respect of many in the International Muslim world whereby if Malaysia can also provide an International e-Halal EPCIS Track and Trace Platform, the country would be able to market Jakim's certification as a world class Halal trade mark. This would mean that not only Malaysian Halal food producers would benefit from JAKIM's new stature as being one of the few in the world to offer Halal track & track certification but also enables JAKIM to market their certification process worldwide.

(3) Eventually JAKIM can make use of this platform to access world wide the Halal Food producers, transporters, slaughter houses and retailers overseas as well as local on regular basis to ensure the Halal food compliance on an online basis.

(4) By reasons of the matters aforesaid, it is essential that the costs of opening up the certified eHalal transport routes door to door be done with the assistance of government funding together in partnership with the private sector. An initial allocation of RM20 million is being planned but this may be increased gradually if the private sector is capable of matching up the funds required and with new eHalal trade routes being opened across the globe.



Q12. How would our telecommunications services providers link up to provide services for track and trace and would it benefit our competitiveness, especially for ensuring Halal Food quality?



ii) Goals

(1) NKEA labs (E&E) have projected GNI contribution from eHalal at USD246.5 million leading to 2020, mainly from the RFID track and trace together with income from Halal Food producers.

(2) However, UMIT's plans are designed to internationalize JAKIM's certification process of not only the food item, but also the transportation and logistics side using an online track & trace method.

(3) It is envisaged that the great potential of engaging markets overseas who will be using the JAKIM online track & trace system as being tremendous as the world Halal Food market is estimated at US$547 billion a year[10]. Hence if Malaysia is to position itself with a good reputation from JAKIM and coupled with an International track and Trace Platform using the state-of-the-art EPCIS engine, it would become an unbeatable combination. The ultimate goal would be to allow JAKIM to set the track & trace standard whereby online certification on different tested routes with wireless sensors,

[10] Excerpts from Wilkepedia on Global Halal food market for trade

whereby thereafter it becomes easier to monitor and enforce compliance.

iii) Implementation Strategy

(1) Firstly, one has to establish the Nationwide Halal track & trace platform. This would then require massive collaboration between private and public sectors. Under UMIT Plan, it is envisaged that this would be crucial to get as many Halal Food stakeholders from farm producers, slaughterhouses, logistics companies to wholesale and retail market outlets into one common platform. There will be resistance from established quarters who do not see the need for such traceability and the costs involved. However, the benefits of online track and trace system, especially to evaluate concepts of Halal, as well as for general food traceability for safety purposes, cannot be compromised. Henceforth after the first two years of implementation, it is proposed that Jakim may make it mandatory for all certified food producers to be on broad into the Jakim eHalal track & trace system.

(2) Secondly there will be a need to develop cross border links to potential supply chain partners overseas who have the same EPCIS platform. These links need to be established such that there is also an automatic link to the JAKIM Sistem Maklumat for online verification.

(3) Thirdly, it is essential to start offering eHalal track and trace services to Muslim Food Exporters and Importers alike worldwide on the capability for eHalal track and trace whereby certain notable routes can be certified and maintained for commercial purposes. In particular door to door routes, especially from the larger Halal Food producing countries notably Pakistan, Australia and China all the way to the Halal food consuming countries including those in the Middle East and Europe have to be taken into consideration. A pilot run has

to be performed whereby the track & trace process should be in conformity with SIRIM's MS1500 standards and tested accordingly.

(4) From the viewpoint of stimulating local door to door track and trace visibility, it is recommended that ultimately it is the consumer who will be in need of the service to examine the eHalal track and trace history before consuming the product and as such the eHalal ecosystem may include features whereby verification can be done via the hand phones.

(5) Last but not least, there is a need for JAKIM to work hand in hand with other similar Muslim certification bodies in other countries when it becomes an issue of appropriate jurisdiction over the certification process. As such, implementation has to be targeted on a bilateral basis as quickly as possible with potentially the first country being China[11] in 2010, followed by other countries including Indonesia, Pakistan, Australia, Middle East and European countries.

iv) Implementation Table for U-Agriculture

Indicator Type	Stakeholders	Item	2011-2015	2016-2020
Project Indicator	**ICT Stakeholders** Active RFID tag manufacturers, Passive Tag manufacturers, Systems Integrators, MOSTI, MIMOS, MIGHT, KPKK,	Linking up EPCIS system to top 1500 Jakim certified bodies to be part of the supply chain for eHalal track & trace	Top 100	Remaining certified companies
Project		Tagging of Food	10% CAGR	50% of non-

[11] China's estimated Muslim population is at 150 million, making them the second largest after Indonesia.

Indicator	MCMC, CoEWSN, EPU, Broadband ISPs, Cellular Oprs, m-Payment systems, data centers **<u>Enabler Stakeholders</u>** JAKIM, HDC, MAMPU, EPU, PEMANDU, MOA, DVS, State Halal bodies, Halal Food producers, transport & logistics cos, warehouse oprs, ports, financial institutions, customs,	Boxes for non-perishables for items > RM100 per box Number of Food Boxes to be tagged	increase in terms of items tagged 10% CAGR increase in terms of containers tagged	perishable boxes tagged 70% of non-perishable containers tagged
Project Indicator		Tagging of Frozen Containers for Perishables	10% CAGR increase in terms of items tagged	50% of frozen containers tagged
Result Indicator		Increase in number of certificates issued for track & trace in terms of revenue to Jakim as well as track & trace fees	10% CAGR increase in certificates 20% CAGR increase Track & trace fees	Compulsory usage of track & trace for countries with certified routes
Result Indicator		GNI	US$50 million	US$196.5 million

c) 

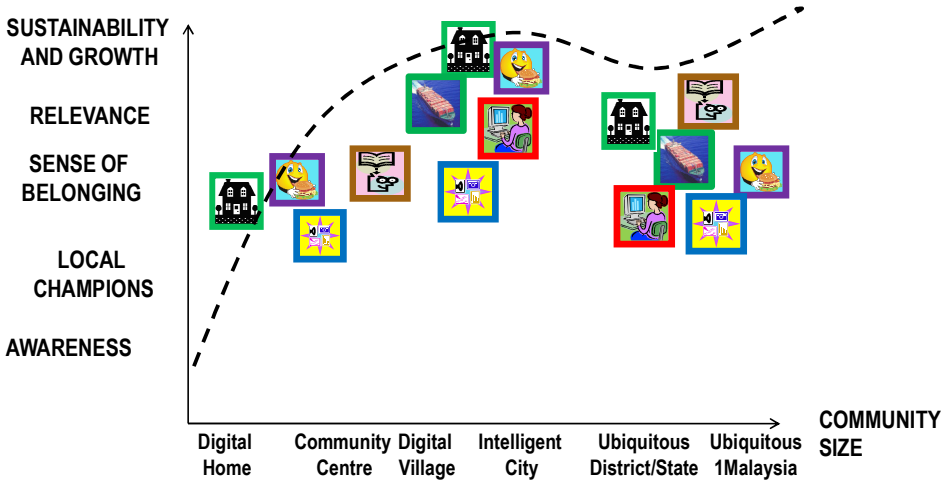
U-homes

- **Development of Ubiquitous homes into Ubiquitous villages, cities and states.**

i) Concept

(1) The word home when used together with Ubiquitous is a misnomer as it may give the reader an impression that we are referring to just the areas within our normal bricks and mortar house with a postal address and the garden area. In actual fact, the home is the main building block from which we form a community, which later on when the community becomes bigger eventually becomes a town and later perhaps a city. Henceforth U-homes are envisaged to be one of the main priorities and in this regard, it is very much up to each village, district, town and even city to determine their own U-home lifestyle. However, to plan for a digital home is now very much left entirely to the private sector whereby under the UMIT Plan, sustainability and vibrancy can perhaps be better if such digital homes can be linked by to the greater U-ecosystem initiated or facilitated by local, state or even federal government involvement. However, the ideal size for a U-homes project varies from village to village, city to city and even state to state. For practical reasons, the issues revolving such projects tend to favor a size from a U-village to a U-state.

U-Homes issues versus Size of Location



(2) However, in order to jump start the process, certain locations shall be identified as strategic pilot projects whereby a ubiquitous lifestyle project may fulfill the relevancy and buy-in as well as sustainability criteria as there are already identified local champions who will spearhead and drive the local communities. These local champions could be the local village elders, or the representatives from both the local government as well as captains of industry who would spearhead the pace of development of their own U-home or community projects. Once these U-communities have been identified, it will then be a matter of linking up these U-communities via a bigger common link to yet another U-lifestyle or ecosystem. U-Village A in Sarawak can be linked to another U-village B in Perlis, which in turn can be linked up to yet another U-suburb somewhere in Greater KL-Klang valley. U-cities in Malaysia can eventually be twinned with similar like minded cities in other parts of the world including Indonesia, Thailand, Korea, Taiwan and China whereby dynamic exchange of information, digital content, M2M services and

even trade introduction and facilitation can be done in a much friendlier environment[12].

(3) As for metropolitan cities, the issues and problems are quite different. Traffic management is a major consideration whereby considering current problems in major cities everywhere, control and planning becomes crucial to tackle congestion in large urban networks. Research has been carried out basically towards the design and specification of future transport solutions featuring autonomy, putting the user in the centre of all concerns and largely oriented to services. Such efforts were eventually to culminate in the emergence of the concept of Intelligent Transportation Systems (ITS), basically relying on a distributed and advanced communication infrastructure favouring interaction in virtually all level, from users to services, vehicles to vehicles, vehicles to infrastructure, and so forth. Interoperability and integration are crucial in this scenario. Adding on to these issues are the now too familiar issues of personnel security, whereby ICT shall be further used as an enabler to assist in combating crime. From 3G to WIMAX, RFID to GPS, Bluetooth to UWB, CCTV to GIS as well as moving on from FTTH towards LTE, such an abundance of technologies coupled with last mile devices such as NFC phones, PDAs and wireless sensors would assist in mapping out the various pieces of the entire U-ecosystem into one large intelligent metropolitan city. The same devices are also a prerequisite for linking up e-commerce and the world of mobile payments. And not to mention also the need to link up with mobile digital television, e-government solutions, robotics and green technology altogether

[12] The cases of Miri city twining up with Panyu city in Guangzhou, in a smart intelligent partnership and the proposed digital city links of Pekanbaru with Langkawi, are just two examples of local initiatives which already have buy-ins with local champions to ensure sustainability going forward. It is anticipated that there will be many more going forward.

whereby the mind becomes the limit. Thus, whether the current industry jargon labeled it as quadruple play or 5in1, it really doesn't matter so long as whatever features being introduced is co-ordinated ubiquitous manner.

(4) In terms of funding, Pilot projects usually require initial government financial assistance but it is also up to the private sector to take up such challenges under a public-private partnership approach. The typical funding requirements for a U-village may be in the range of RM5 million. It would be ideal to have a U-township project in the range of RM10-15 million whereas a U-city would be such that one could reach RM20 million. On the other hand, the development of an entire state would largely depend on the size and complexity of the niches identified and in this respect the funding may vary from RM30 million to RM300 million. In general, these amounts would be spent not so much on building up basic last mile broadband infrastructure but a substantial amount would also be spent building up intelligent solutions coupled with content and applications and with devices & services thrown in together with training and promotions.

Q13. How would you link the relevancy and sustainability of a U-homes project to one which you may be doing now? Do you think that we should consult the public in determining the size and features for developing a U-village, for instance?

Q14. What ICT services would you like to see in your own U-home project and how would you link the five core intelligent infrastructure to provide this?

ii) Goals

(1) The primary goal is to bring not only the benefits of broadband but a whole lot of applications to the U-home. This means not only the ability to surf the Internet for a majority of the local community, but also offers an array of applications and content such that in due course, a new Ubiquitous Lifestyle has developed which , if proper guidance is maintained, will lead to a healthy and civic society.

(2) In order to achieve the abovementioned goal, UMIT projects plans to aggressively draw up key ICT applications, popularize technology services, and solve social and economic problems.

(3) Firstly, it would construct an intelligent infrastructure, develop innovative technology services, and provide a high-quality living environment that is safe and convenient. This would include providing basic additional broadband infrastructure, as and when required, especially in the rural and underdeveloped areas.

(4) Secondly, there is a need to propel the villagers into adopting new way of doing things using ICT such that step by step and with the ability to integrate various e-initiatives together, the villagers will be able to share one platform to transform the Ubiquitous homes into one big Ubiquitous community.

(5) Thirdly, there is an automatic sensible desire to combine U-communities into one which incorporates various aspects of U-Learning, U-entertainment and U-work Lifestyle goals. This may be done in accordance with the flexibility of designing New Growth Area projects as in our earlier Example 3 hereinabove. With this flexible approach, it will truly value add to the concept of Ubiquity and enables each community to choose its own sense of belonging.

(6) Next, within a Ubiquitous community, there is a need to incorporate personnel security systems by introducing a variety of next generation devices coupled with wireless sensor networks and monitoring systems plus diversifying the functionalities of the mobile application systems. Planning the requisite ecosystem for the establishment of the new-generation of internal security mobile computing system and wireless network applications and elevate the existing national information system based on the Internet to mobile applications based on the wireless communication technology would be the most challenging of tasks, unless done with a futuristic concept in mind.

(7) The promotion of video surveillance systems including the establishment of an optimal video surveillance system leveraging ICT technologies and image analysis technologies and combining the existing video surveillance systems of both the public and private sectors as well as the police information system to create a tightly-knit security network would be seen as leading to a safe digital society and a living environment without fear.

(8) Once the local population appreciates the benefits of the U-lifestyles being linked up under their own U-community, there will be opportunities for everyone to have “a piece of the action” such that proponents of mobile commerce, content providers, systems integrators, hardware vendors and backhaul communication infrastructure providers will all have a “win-win” situation.

(9) Last but not least, the ultimate aim is to let people experience the benefits of ICT and plan applications that meet people's demand, in line with Vision 2020 whereby we have to nurture, train and promote a new 1Malaysian culture.

iii) Implementation Strategy

(1) At least three districts will be chosen for 2010/11 and identified as pilot projects for U-homes. Three sizes will be chosen, ranging from a small U-village with less than 5,000 people, a medium size U-township of less than 50,000 people and a bigger U-city or even U-state with more than 200,000 people. There will also be possibilities of linking with one U-city or U-state with another via Ubiquitous interoperable data networks once these three projects have been completed at least 50% half way through implementation datelines. Special emphasis, especially for U-cities and U-State, shall be given to locations in Sabah and Sarawak whereby because of the wide reaches of land mass, Ubiquity is one of the answers to urgently bring forth a better quality of life.

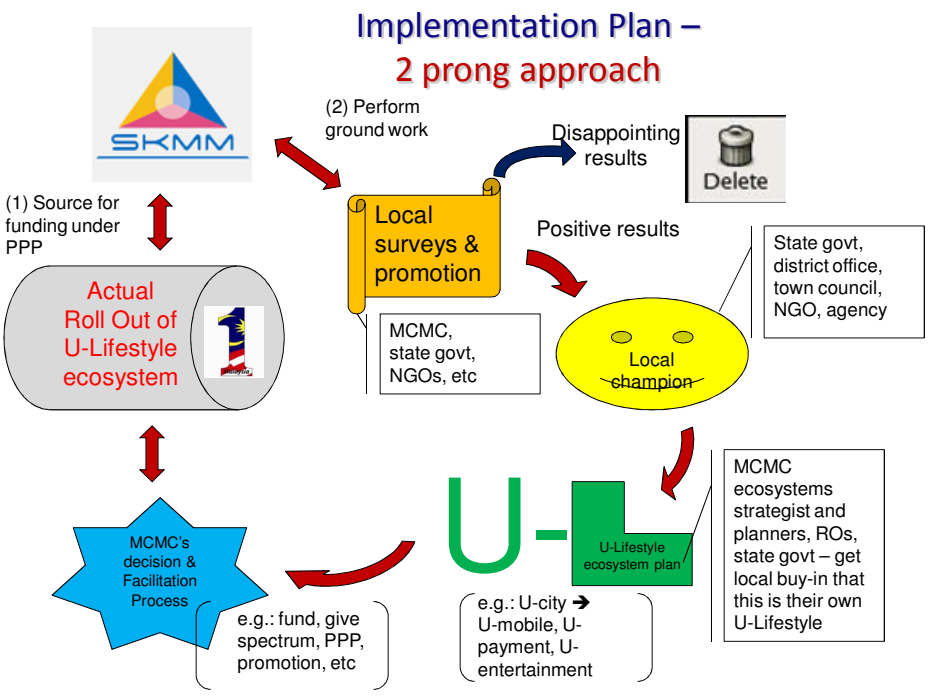
(2) There will be a two prong approach towards implementation. Firstly the necessary surveys and identification of local champions shall be carried out. Thereafter niches will be identified in all three cases whereupon depending on their requirements, ICT applications would be designed to suit their requirements. Thereinafter, it is envisaged that it will take up between 2-6 months for actual roll out to happen, depending on the complexity and size of the project involved.

Examples of Niches for U- Villages, Cities or States

– Good for a pilot test-bed project riding on other Ubiquitous Lifestyles

(3) In the meantime, the amount of funding shall be ascertained and depending on the combination of funds available, usually a combination of public and private sector funding the Request for Proposal (RFP) shall be issued accordingly. In terms of actual monitoring of the project once the RFP has been issued, it will be up to the local champions, who have identified their projects and niches to work together with the authorities to monitor the success or lack of success otherwise, as they will have to sell the benefits of their project to their own people.

(4) Once a U-home project has reached certain milestones and achieved certain KPIs, MCMC will review the success of such project and commence implementation on a much larger scale from 2011 onwards.



iv) Implementation Table for U-Homes

Indicator Type	Stakeholders	Item	KPIs 2011-2015	KPIs 2016-2020
Project Indicator	**<u>ICT Stakeholder</u>** MCMC, MOSTI, EPU, MITI, SME Corp, PIKOM, broadband ISPs, Celcos, fixed line opr, data centers, Eq. Vendors & suppliers, Device manufacturers, Content developers,	Three U-homes project initiated in 2010/11 with surveys, RFPs & business models in place	Completion of infrastructure portion of project by end of third year	
Project Indicator		Time Lines - Three years maximum for completion	U-village – 6 months U-township – 2 years	U-city – 3 years

Result Indicator	Systems Integrators, Cable Landing station operators **<u>Enabler Stakeholders</u>** MOSTI, KPKK, MITI, EPU, SME Corp, Local government, KettHA, PDRM, LDN, LHDN, property developers, village elders, ADUNs environment groups, security cos, school heads, clinics, banks, post offices, community centers ops, food centers, transport cos,	Increase in number of M2M transactions including U-payments, U-content, etc	Volume of M2M transactions increase to be gauged by surveys – 10%	Volume of M2M transactions increase to be gauged by surveys – 30%
Result Indicator		Better quality of life indicator	Projects to be analyzed at the end of third year to gauge success via surveys - 30& increase in satisfaction	30% Increase in awareness and adoption of U-home system
Result Indicator		Greater security protection and less crimes - Crime down by 30% in networked monitored area	20% reduction in petty crimes	10% reduction in petty crimes
Result Indicator		GNI total RM1 billion	RM 200 million	RM 800 million

d) U-Entertainment

- National content hosting platform (NCHP)

i) Concept

(1) This is an opportunity for planners to invoke a National Content Hosting Platform with the latest intelligent infrastructure to bring forth content to the masses in manner tailored to suit the needs of the Ubiquitous society, and in an era whereby an abundance of content is flooding the air waves as well as on the Internet.

(2) It brings forth the challenges of maintaining the right type of content suitable for the needs of the local community and offers many challenges, which if handled appropriately, would see instantaneous results.

(3) It also brings forth the evils of having the wrong content and the necessity to impose restraint in certain cases. As such the National Content Hosting Platform (NCHP) may be broken up into state and district levels whereby hosting of content, especially blogs are monitored at local community levels.

(4) However, the capabilities of bringing nationwide content down to the level of a small community may not be feasible and economical. Henceforth, certain guidelines for creating U-entertainment lifestyles for the National Content Hosting Platform must be determined at a National level whereby the implementation can be done at district level at a later stage. However, certain interactive content, including local community blogs and SME websites should be encouraged to spur the “buy-in” process.

(5) By and large, a Ubiquitous-entertainment ecosystem would be free to choose a wide range of content available on the Internet and the

air waves. It would then enable free market competition to pitch for the audience. Local content would stand side by side with foreign content and it remains the duty of the regulator to maintain certain form of guidelines as to how best to groom the right level of content which will reach into our own homes and society.

Q15. If you were to supervise and maintain the National Content Hosting platform, what would you like to see being disseminated via this platform?

ii) Goals

(1) The primary goal is to improve the quality of life by offering the Malaysian audience with a wider choice of content and through a variety of infrastructure and modes of delivery.

(2) In this respect, the designers of any U-entertainment ecosystem need to work within the greater framework of a Ubiquitous home or community whereupon the latter becomes a catchment area to deliver such U-entertainment.

(a) Whilst the ultimate goal is to improve the quality of life for all in Malaysia, nevertheless, the social objectives need to be taken into consideration, namely to contribute to Malaysia becoming a knowledge society, by:

(i) Making access and content available everywhere and affordable to all; and

(ii) Establishing a secure, robust and safe networking environment.

(b) In addition, the cultural objectives should not be overlooked as well, especially the need to consolidate racial and national unity through the projection and nurturing of national culture, by:

(i) Encouraging the production of content which is high quality, innovative and creative; and

(ii) Encouraging the production of content which will enrich and enhance the quality of material and spiritual living in accord with social-economic development.

(c) Thirdly, there is the economic angle whereupon there is a need to make Malaysia a major centre for the regional and global content, by:

(i) Developing required capabilities to compete; and

(ii) Achieving efficiency and financial viability.

(3) Other peripheral objectives include looking at the new way of life whereby mobility is of greater importance, especially in delivering news and other information based content on the move for busy people. As such one of the goals is also to provide alternative platforms for Mobile Digital content, the need for which is becoming more and more apparent as we approach 2020.

iii) Implementation Strategy

(1) The first approach is to create the National Content Hosting Platform or NCHP. Unlike the approach in some other models which may utilize a hosting platform for online videos, games, information for mobile devices, which is then monetized, the aim of the National Content Hosting Platform to provide the same but for the social needs of the local communities. As the country is well diversified with different cultures as well as different tastes for foreign cultures, there should be no shortage of choices of content available. Hence there is no need of duplicating the likes of Youtube, Episodic, Facebooks and the Platform. However certain features are similar in order to attract the crowds. Security of content and Intellectual Property issues will be also addressed.

(2) Local start up media companies can rely on the NCHF as their open, central hub for managing, monetizing, and syndicating millions of video views may enjoy national publicity as well as other incentives which will encourage unmatched versatility for designing and supporting video businesses on PCs, mobile, and TV.

(3) In order to support the sustainability of the NCHP, the participation of our service providers or licensees from NFPs, NSPs, ASPs and CASPs are all crucial in order to create the reach required via national broadband and media networks. A state of the art technical architecture is required to facilitate the dissemination and collation of content but more importantly the human touch must be present, not only at national, state but also at district and even local community level. Only then will there is the oomph required to ensure that this can be an alternative way of life for the folks in the kampongs, towns and cities. Competition to produce the most popular content, including animation, online games and even advertising shall be encouraged, subject of course to usual regulatory guidelines.

(4) Last but not least, the NCHP shall be linked to other Ubiquitous infrastructure such that with the flick of a button in the not too distant future, a viewer can switch from a U-transport EPCIS platform to a U-Work TSM payment gateway, intelligent information systems providing information from environmental issues, stock prices down to information on everyday consumer items. All these will hopefully lead to a more knowledgeable society via a choice of broadcasting services including IPTV networks, digital terrestrial television (DTTB), Peer2Peer networks, Free2 Air as well as dynamic content feeds from mutually arranged twinning networks.

iv) Summary of Implementation Plan and KPIs for U-Entertainment

Indicator Type	Stakeholders	Item	KPI 2011-2015	KPI 2016-2020
Project Indicator	**ICT stakeholders** KPKK, broadcasters, content developers, Device Vendors, broadband ISPs, local community bloggers,	NCHP done at Federal level	100% completion by 2011	
Project Indicator		Sub- servers located at state and district level	100% completion by 2013	
Project Indicator		Local servers at each community linking up P2P	%0% of local communities or CBCs	
Result Indicator		Amount of content being hosted	30% local	50% local
Result Indicator		Amount of content being watched	10% local	30% local

e) U-learning

Working to achieve a conducive and sustainable distant learning experience over national broadband networks

i) Concept

(1) If there is only one main component for most governments to justify a national broadband infrastructure, it would be for the betterment of the nation's educational system. In this respect, a Ubiquitous learning lifestyle is not only essential for the development of 1Malaysia as a whole but it also brings into question the ability to utilize the broadband networks available to create a conducive

learning environment for all thereby ensuring an equitable provision of affordable services over ubiquitous national infrastructure.

(2) Not surprisingly, much of the previous concepts for rolling out broadband infrastructure have been focused on providing essential Internet services for the rural areas. This will continue to be a primary focus but now the time has come to incorporate not only basic infrastructure but also allow for more intelligent educational infrastructure, suitable for not only the classrooms but also for the community learning as well as industrial and professional training courses. Private sector initiatives are crucial such that training and the human touch can be disseminated appropriately.

(3) The learning curve for each and every one of us technically starts from the day we are born and ends only at our last breath. In this respect, although many of us equate U-learning lifestyles to be for the students and younger generation, nevertheless there remains a lot which Ubiquitous infrastructure can do to provide training for all walks of life. For instance, we actually learn a lot by watching the news, even though we are not aware that we are learning. The main issue then becomes what sort of educational content is deemed suitable. The choices are abundant, and so is the medium of delivery of such educational content.

(4) Traditional funding allocations for e-Learning may be difficult to ascertain for U-Learning concepts but essentially the nature of the services is for interactive operating expenditure. There may be already an abundance of educational content in place whereby the bulk of the financial requirements going forward is in rolling out such content in the field. Hence to build up a nationwide Ubiquitous interactive educational platform may require more of in terms of maintenance or operating costs rather than capital expenditure. Thereafter, operating costs may vary at different locations. Within

the state of Sarawak alone, it would possibly cost the government an estimated RM2 million per district per annum just to maintain an effective U-Learning system to reach not just a community centre premise but into the living rooms or longhouses of our peoples.

Q16. How important is distant learning for adults as opposed to normal school curriculum? Can the two co-exist and be merged later on?

Q17. Would the CBCs, CBLs or even certified Cyber cafes be alternative outlets for maintaining support for U-learning experiences rather than that in traditional schools, especially after normal school hours?

Q18. Alternatively, should we concentrate to bring the benefits of U-Learning into the living rooms of every house via digital kampong models?

ii) Goals

(1) To reach a consensus that language, reading, and information capabilities need to be strengthened which will create a learning society. In doing so, to incorporate the best available U-learning tools, not only in the form of notebooks but also in every other means to ensure a proper learning environment regardless of locality.

(2) To improve human resource training by increasing the quality of higher education and vocational technology training via information technology; and

(3) To offer Malaysians from all walks of life and regardless of locality the chance to participate in creating and building a Ubiquitous learning platform whereupon they will be able to communicate freely with not only the best teachers living on the other side of the globe but also the chance to provide others to learn from their experiences or to train others.

iii) Implementation Strategy

(1) Continuous efforts have been made to provide the essential tools for Ubiquitous learning as well as distant learning. In this regard, MCMC continues to roll out the provision of affordable netbooks to the poor as well as students in the rural areas. However, there is a need to establish a data centre and applications platform (cloud computing) to support to link up 10million users. This would also be the based upon the reach of the National Edu-Info Network or NEIN, such that learning can be fun but the relevant educational content can be delivered in a manner which functions reasonably well without much complications.

(2) Specialized efforts shall be made to enable the schools and colleges but also the CBCs, CBLs and even the Cyber Cafes to become centers for U-Learning experiences. In this regard, training and promotion activities can also be part and parcel of the services offered at these centres whereby it becomes a natural choice for those in the guest for knowledge to participate in the activities of such centers. However, it should be emphasized that not only should U-Learning experiences be available at such centers but also wherever possible be permeated into the living rooms of every home. In this regard, especially in Sabah, Sarawak as well as many other rural parts of the country, the concept of Digital Kampung should be made into a U-learning experience.

(3) An initial allocation of RM20 million is proposed for e-Learning pilot projects involving these centers. These centers, regardless of location, then facilitate as distribution and collecting points for training into the living rooms of surrounding village homes whereby specialized training programmes will be selected to test out the U-learning experiences.

(4) Furthermore, there is a need to maintain standards and accreditation of training courses. In this regard, public and private sector collaboration is essential to ensure that there will be enough skilled human resources to deliver the U-Leaning ecosystem.

iv) Implementation Table for U-Learning

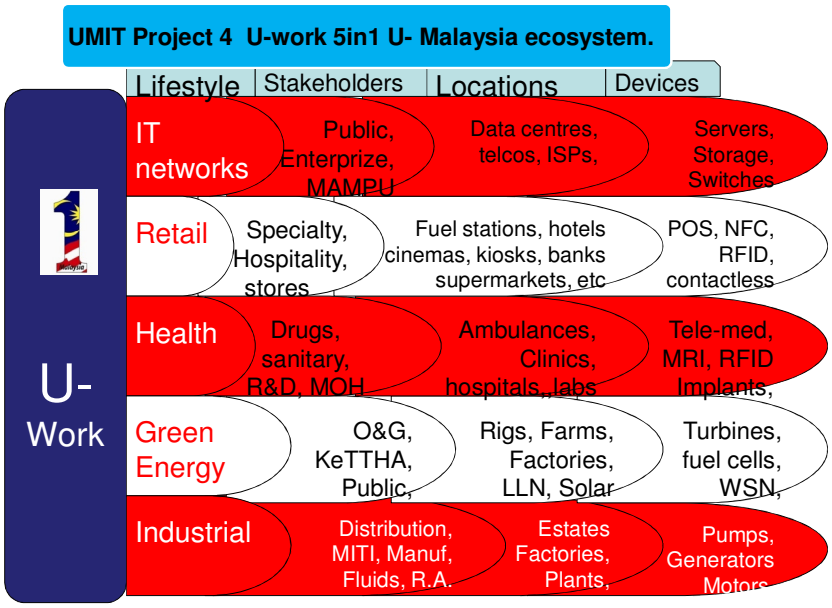
Indicator Type	Stakeholders	Item	KPI 2011-2015	KPI 2016-2020
Project Indicator	**ICT Stakeholders** MCMC, MOE, MOHE, Universities, MOSTI, Broadband ISPs, Telcos, PC/notebook distributors and manufacturers, Software distributors, Systems Integrators, e-Educational content	Number of Schools, CBCs & CBLs covered with U-Learning programs – total 50%	60%	40%
Project Indicator		No of students enrolled in such U-Learning programs - 10 per CBC	5 x No of CBCs	10 x No of CBCs
Project Indicator		Digital Kampung - Surrounding 2km areas from CBCs to be wireless broadband zones	50% of all areas with CBCs, or other distribution points	Remaining 50 %
Result		Better appreciation	30% of CBCS	GNI 2020 of

Indicator	providers, **<u>Enabler Stakeholders</u>** Schools, Universities, Teachers, Students, distant learning cos	of U-Learning facilities - surveys 50% satisfactory by 2020	achieving the KPI of being utilized frequently.	US$465M

f) U-work

- **Creating a ubiquitous work environment to enable Malaysians to compete with the rest of the world**

i) Concept



(1) Science and technology has always been regarded as one of the best enablers going forward to value add our GNI. In this respect, a U-work environment should be as intelligent as possible to enable humans, whilst at work to leave the more mundane chores of our everyday lives to artificial intelligence. Quite naturally the extent to which the Ubiquitous work environment can influenced our working lives depend on a variety of competing factors.

(2) Within the Ubiquitous work ecosystem, we have selected five lifestyles where we have identified potential niches. These five are IT networks, retail, health, green energy and industrial. Ironically, the common factor could be the ability of next generation devices as well as other mechanical devices to act as the Ubiquitous uniting factor.

(3) The other key factor is the ability to offer ubiquitous linkages with the Internet within the everyday work experience to offer online services ranging from payment systems to booking of online tickets and the need to be in the know of what is happening elsewhere.

(4) No Internet of Things working environment is complete these days without addressing concerns regarding our environment and green technology.

(5) On the whole, a U-work environment also has the capability of being designed as a Mega Ubiquitous ecosystem whereby many other competing factors including mobile payment systems, CCTV, RFID, cloud computing, robotics, solar and many others are embedded into one platform. As such designing such a working environment becomes a distinct project of its own and by nature of its locality, will skew the outcome.

ii) Goals

(1) The primary goal of U-work environment is to create the conducive working environment based upon the various requirements and needs of the society at work. It is essential to start the design from the onset correct to suit the needs of a new 1Malaysia lifestyle. Whether it is 3in1 even 6in1 system, the goal still would be to create a more conducive working environment whilst remaining competitive thereby creating higher incomes from our workers especially those fresh innovative minds at work.

(2) With the abundant choice of systems available, it would be best to plan for the needs of the futuristic working environment first before committing to specific goals.

iii) Implementation Strategy

(1) One of the first steps is to ascertain the locality of the intended U-work project. A supermarket environment would be quite different, for instance from an industrial plant. Three pilot projects would however be selected, one from each working environment. Retail would be given top priority, with the needs of a Ubiquitous 5 in 1

play covering a cashless and even cardless society with financial m-payments, transport, authenticity & security, track & trace and e-wallet being top of the wish list. Green Energy and Health currently are also being preferred but both projects must be capable of justifying their own business models. However, IT networks as well as industrial would come in as specialized projects, to cater for specific needs and budgets. In this respect IT networks would be designed to provide a Ubiquitous artificial intelligence network using cloud computing techniques, robotics, and data mining to support other lifestyles including U-retail, U-green energy, U-health and U-Industrial.

(2) Based upon these criteria, the choice of designing a U-work environment, with the various competing factors to match the requirements of the working group, lies very much within innovative ideas from the private sector. MCMC acts more as a facilitator but nevertheless, would serve as the pace setter, especially if it involves any regulatory aspects involving our licensees.

(3) Thereafter, determine the next action plan as to whether there is a need for facilitation in the form of a pilot trial and whether it would serve any commercial purpose or is it just a technical trial.

Q19. Are there any other priorities which you may think is more important that the five stated, namely, U-retail, U-green energy, U-health and U-Industrial? How do you seek to bring forth a greater ubiquitous ecosystem using the five intelligent infrastructure above at your work place?

iv) Implementation Table for U-Work

Indicator Type	Stakeholders	Item	KPIs 2011-2015	KPIs 2016-2020
Project Indicator	**ICT Stakeholders** PIKOM, MOSTI, MDec, MITI, SME Corp, Computer manufacturers, Systems Integrators, Software cos, **Enabler Stakeholders** SMEs, SSM, e-Government solutions providers, MAMPU,	IT Networks – Creation of an Intelligent U-work environment based upon artificial intelligence	TBD from RFP	GNI 2020 of US$414M
Project Indicator	**ICT Stakeholders** PIKOM, MOSTI, MDec, MITI, SME Corp, Computer manufacturers, Systems Integrators, Software cos, **Enabler Stakeholders** SMEs, SSM, KDN, KPDNKK, e-Government solutions providers, MAMPU,	Retail – 5 in 1 play with mobile payments, transport, authenticity & security, track & trace and e-wallet	TBD from RFP	GNI 2020 of US$426M 2.3K jobs

	Retailers associations, Chambers of Commerce, NGOs			
Project Indicator	**ICT Stakeholders** PIKOM, MOSTI, MDec, MITI, SME Corp, Computer manufacturers, Systems Integrators, Software cos, **Enabler Stakeholders** MOH, e-Government solutions providers, MAMPU,	Health	TBD from RFP	GNI 2020 of US438M
Project Indicator	**ICT Stakeholders** PIKOM, MOSTI, MDec, MITI, SME Corp, Computer manufacturers, Systems Integrators, Software cos, **Enabler Stakeholders** KETTHA, e-Government solutions providers, MAMPU,	Green Energy	TBD from RFP	GNI 2020 of US$160M

Project Indicator	**ICT Stakeholders** PIKOM, MOSTI, MDec, MITI, SME Corp, Computer manufacturers, Systems Integrators, Software cos, **Enabler Stakeholders** MITI, MIDA, e-Government solutions providers, MAMPU,	Industrial	TBD from RFP	GNI 2020 of US$467M

4) Working in tandem with EPU's New Sources of Growth and NKEA Lab strategies

a) It can be said that the UMIT Plan shall be designed to work in tandem with the EPU's New Sources of Growth and the NKEA strategies. This is essential in order to achieve greater synergies between the various government agencies, thereby creating a more ubiquitous government.

Rationalization of UMIT with PEMANDU's NKEA & EPU's NSG

NKEA sectors	EPU's NSG	UMIT
Oil and Gas		UMIT provides a Ubiquitous engine powered by the Internet with e-Commerce and M2M Applications to deliver all NKEA sectors and NSG areas.
Electrical and Electronic	Malaysia: the Preferred Location for Manufacturing Solutions Malaysia: top 5 global PV industry player	
Education Services	Malaysia: the Preferred Destination for Higher Education	
Private healthcare	Global Dominance in Tropical Diseases Healthcare	
Palm oil and related products	Down streaming Palm Oil	
Agriculture	Myherbs for Global Wellness Malaysia: The Gateway for Halal Business	
Tourism	Tourism for the Emerging Economies Medical tourism (EC Secretariat)	
Wholesale and retail		
Financial Services	Islamic Finance (Central Bank)	
Business Services		
Greater Kuala Lumpur		
(ICT)	Wireless sensor network	

5) <u>The establishment of the 1Malaysian Internet of Things Engagement Centre (1MITEC) and the Ubiquitous Lifestyle Application Fund (ULAF)</u>

a) In line with the latest government philosophy of emphasizing on private sector to take the lead in ICT development, it is essential for the government to engage the private sector such that each project, even if there is a substantive government involvement in terms of facilitation, there is at least one private sector "champion". In this respect for UMIT projects whereby although government involvement is crucial there remains a need to have an official platform for public-private sector call for collaboration (CFCs) and other public-private partnerships. Thus MCMC is mooting the creation of a 1Malaysian Internet of Things Engagement Centre or 1MITEC.

b) The objectives of 1MITEC would be as follows:

i) To promote a functional centre to synergize, engage and implement the UMIT Plan amongst the private sector => a public private sector think tank on Ubiquity and the Internet of Things

ii) To introduce New Internet of Things concepts, applications, devices and services to further enhance the NKEA and NSG sectors within the framework of a Ubiquitous Lifestyle environment

iii) To create a channel for all NGOs including FMM, PIKOM, WSN, RFID Centre, etc to allow them to make recommendations to the ULAF funding Committee and to act as focal point between public & private sector initiatives as well as to monitor ULAF funded projects; and

iv) To act as an innovative Forum for developing matured proof of concepts (POCs) for new technology growth area pilot projects including WSN, RFID, LTE, UWB, embedded devices, e-payment systems, DSA/PKI and M2M services.

c) The creation of a Ubiquitous Lifestyle Application Fund (ULAF)

i) It is now essential to ensure that there should be every opportunity for Malaysians to benefit from developing the Ubiquitous Malaysian ecosystem. Whilst the main role of the government may be to facilitate or create the pertinent policies leading toward favorable Ubiquitous Malaysia environment, nevertheless in many cases, the seed money is crucial[13] to "test "out the proposed lifestyle or ecosystem even before it is given a decent chance of survival. The ULAF fund shall come primarily from MCMC's own internal financial source and shall be structured in ways similar but not exactly the same as funding the NCDG[14].

ii) It is proposed that the initial amount of RM100million be allocated for the ULAF based upon the inputs and studies from the NKEA Labs as well as from the National RFID Economic Impact Studies done in 2009 by MCMC. Whilst the amount of the ULAF may be seen as insufficient, nevertheless for special projects, there might be a need for greater allocations to handle special funding needs related to traditional core MCMC telecommunications development, including postal & courier, m-commerce and near field communications, other forms of short range communications and devices as well as next generation wireless broadband networks.

iii) Last but not least, the ULAF funding shall give the ICT industry much needed boost to ensure that research & development is done in a cohesive manner to reduce the need for duplicity and the creation of champions for each segment so as to work on a common ubiquitous

[13] The original version of the National Broadband Plan in 2004 was to get the government to fund 5% of the estimated total costs of the entire national broadband infrastructure. Thereafter, it is envisaged that the private sector would take up the initiatives and continue with the momentum.

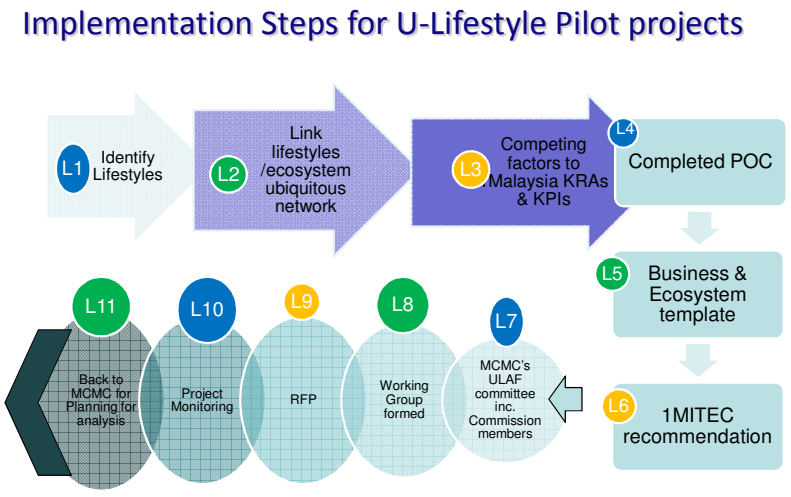
[14] This includes the current NCDG as well as many of the other previous telecommunications related pilot projects, including the Penang & Kulim Pilot Broadband Project, the Sarawak Rural Broadband Initiative as well as Wireless KL.

platform. There will be a consultative and monitoring role for the 1MITEC such that there is no room for complacency amongst the public and private sector alike when it comes to allocation of funds for U-Lifestyle projects.

Q20. Do you support the establishment of the 1Malaysia Internet of Things Engagement Centre or 1MITEC? Can you recommend some of the possible participants and do you think that the objectives of 1MITEC stated above are sufficient to attract your own participation?

Q21. Should there be a Ubiquitous Lifestyle Application Fund managed and funded by MCMC or is the UMIT Plan so ambitious that it be best funded not only by MCMC but the full scale implementation be done and funded by the government as a whole?

iv) A detailed step by step procedure for funding under ULAF is as outlined below:



6) Conclusion

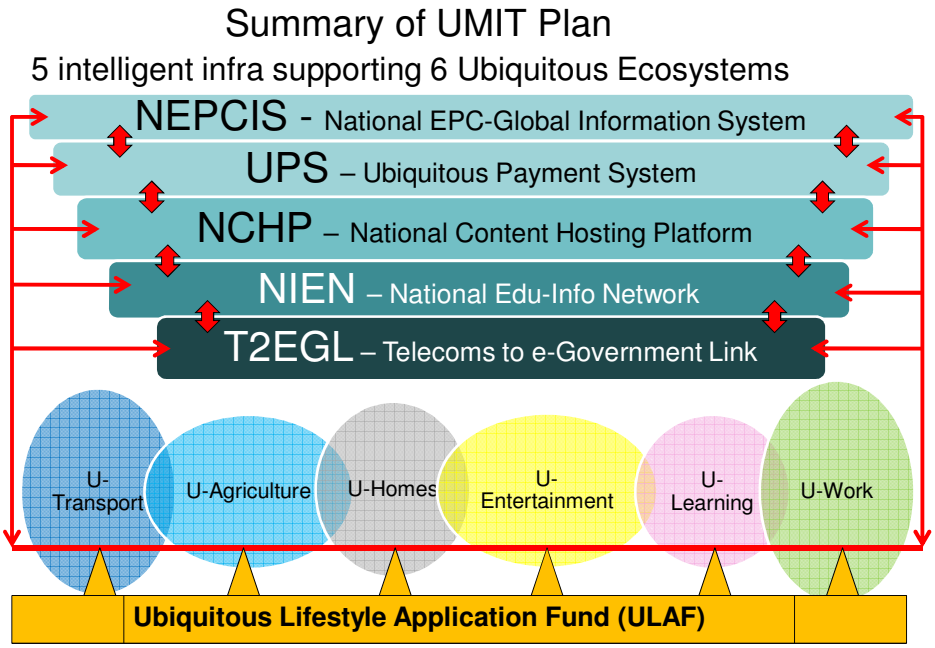
a) The UMIT is tailored to provide a casting net wide enough to cater for all Ubiquitous pilot projects with public-private sector collaboration in mind. With the Ubiquitous network to be built for all lifestyles, it remains and will constantly be a dynamic one which is the essence of a sustainable ecosystem.

b) Malaysia has now seen the need to enter into the arena of ICT services and M2M applications, without which we will be left behind, especially where the construction of next generation intelligent infrastructure is already the talk of the day from all across the globe. More importantly, the need is apparent, especially since 67% of all Malaysians live and work in urban and sub-urban areas, whereby the Internet will be at their doorstep in the very near future.

c) It is not too late for Malaysia to embark on a conceptual Ubiquitous plan of this nature but it is also the beginning of a stage whereby soft skills and mind sets become more important than just providing mere broadband. The creation of 1MITEC and the ULAF is a mere start. In a sense, this is a

good sign as it reflects the continuing sophistication of Malaysian society and the previous RFID industry which is now matured. Hopefully, with the five intelligent infrastructure and the six identified core UMIT projects, we should be able to continuously value add to ensure a better life style for all in Malaysia whilst still being able to stay competitive with the rest.

Q22. On the whole, what are the weaknesses and strengths for the implementation of the UMIT Plan? Please give specifics on each U-lifestyle or ecosystem?



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