Informative Global Community Development Index of Informative Smart City

JALALUDDIN ABDUL MALEK
E-Community Research Centre
Faculty of Social Science and Humanity
National University of Malaysia
Universiti Kebangsaan Malaysia, UKM, Bangi. 43600 Selangor
MALAYSIA
jbam@ukm.my

Abstract: - Informative Global Community Development Index (IGC) is an analysis method that looks at the development of the community currently residing in a smart city. From the understanding method, the development of intelligent cities especially Putrajaya and Subang Jaya has to develop the community within into IGC. Based on a deontological ethics, the process of developing an intelligent city has to return maximum interest to the majority of the residing community in terms of hardware and software. The enhancement of IGC has become vital as the mile mark in developing Malaysia into a developed nation by the year 2020. In conjunction to that the method of cumulative index analysis IGC development has been used in this research as the main method in measuring the development of IGC. 127 middle class families in Subang Jaya Smart City were chosen as research respondents in order to measure the IGC development index in Subang Jaya. All the variables are covered under ability component and humanware, management component and information supervision (infoware), components of ownership and communication and information technology usage (ICTs (Technoware) as well as the usage value oof ICT and cyber ethics (valueware). The IGC development Index which was used utilized the Rogers scale which looked at levels of innovation, pre-acceptance, pre-majority, final majority and final scale. The analysis showed that most of the residents in Subang Jaya only achieved IGC development in the pre-acceptance, pre-majority and final majority scale. This meant that there weren’t any of the residents in Subang Jaya which achieved the final scale.

Key-Words: - Information Global Community Development Index of Informative Smart City

1 Introduction
IGC refers to the community which has developed creativity and innovation which can be proved through the development of their own technology. IGC is a society in an Intelligent City that is capable of learning, managing their town, high level of integrity and proactive towards a more holistic development (Simmie & Lever 2002). For that purpose, the development of ICG in Intelligent Cities are more objective and subjective as well as being quantitative and qualitative because it also involves development process development ethics and a variety of variables.

Intelligent City refers to a city that has all the infrastructure and infrastructure of information technology, the latest technology in telecommunications, electronic and mechanical technology. The completion of all infrastructure and infrastructures were used in order to unite, promote, acquire and higher circulation of information and quality of living all together. Also to develop a healthy relationship between man and man, man and his surroundings and man and his creator (MTPRD 1997).

2 Issues of IGC and Intelligent City
the development of intelligent city and ICG before this were viewed from a utilitarian ethic (Quinn, 2006). Utilitarian ethics of development of intelligent city and ICG meant that it gave the most benefits to the majority of the society overall. These clusters of utilitarian ethics has a tendency to lean towards usage science that gives focus towards the final product of development. This particular ethic is very teleological which looks at the moral and ethics based on how far is the end product, aspirations, targets, purpose, final purpose and final decision development. Ethics of teleological egoism for example looks at morale determination based on the individuals happiness and prioritizes the rationale of loving ones self. While the teleological utilitarian
ethics of John Stuart Mill (1806-1873) looks at moral and ethics which can be determined through how far and action allows for maximum benefits and allows for happiness for the majority of the human race. In this research the ethics of urban development using utilitarian ethics specifically the intelligent city and ICG is contrary to a teleological view and rather adopts a more deontological point of view. Deontological ethics for the development of intelligent cities and ICG is based on Kantianism which was founded by Immanuel Kant (1724-1804) which states that development should be based on responsibility, morality, commitment, self esteem and pureness of self. Kantianism looks at development as not only as a final product or final target but rather looks at the whole process bad or good as well as the ends of means. This ethics was summarized in the ethics of hypercyberethics as been explained in the components and variable of the coming index (Lynch 1996).

The deontological Kantianism ethics believes that every action and efforts towards the development of the intelligent city and ICG has to within moral limits and abide to a specific sets of rules. Morales and rules in the development is understood to be universal meaning that it emphasizes truthfulness and fairness. This means that the development of intelligent cities and ICG including its effects has to have the specific processes which can be concluded through stating what, why, how, when and who. Therefore as you can see in diagram 1, the development of intelligent cities and ICG is a long process which involves certain sets of activities involving input, throughput (process), output and outcome. This long process also meant that the emergence and the development of intelligent cities and ICG in Malaysia had to go through development phase which began in RRJP1 (New Economic Policy), later in RRJP2 (National Development Policy) and finally RRJP3 (Vision Development Policy). These processes are further clarified by the Malaysian Plans (MP) which began within MP2 to MP9. In that tenure, morally and ethically, the emergence of intelligent cities and ICG was first began through the emergence of agricultural societies, industrial societies, and now ICG. The development process was motivated by globalized moral and ethical achievement (universal) that later adopted to local needs (Glocal). It was meant for the development of economy and race development which was to be provided for all while generating competitiveness globally. The process of developing an intelligent city and ICG will continue to the extent that it will be able to develop and generate its knowledge and local technology. From the ethics and moral point of view also the development of intelligent cities and ICG will continue through a structures process until it reaches its outcome which is ICG fully developed by the year 2020.

3 ICG Index and Socio-Technological Change

In correlation with the deontological Kantianism ethic and Malaysian development policy, past researches regarding the development of ICG has gone through a process of socio-technological changes. Which refers to the changes within the scope of humanity ICG derived from intelligent city development. Changes in Socio-Technology that is being highlighted is the changes in aspects of disciplines of knowledge, method to acquiring knowledge, methods for management and administration as well as changes in self-ability, everyday life value and innovative value(Hairudin Harun 1997).

Innovative value IGC is an affect of highest socio-technological change in intelligent city. For that reason, the IGC socio-technological change has continuum and its certain growth properties. Rogers (1986) dan Rogers (1995) gives five continuum divisions of IGC socio-technological change. Diagram 3 shows normal curve of five continuum phases IGC socio-technological change in intelligent city.

Phase 1 is IGC who achieve innovative level namely perfect progress achievement where the individual and its society achieve wisdom level. They are brave to try ICTs innovation whether proactively or silently. They also dare to take risk and have high quality of self growth value; they possess high level of ability, adaptation capacity and also ICTs diffusion.

Phase 2 is early recipient who is considered as almost closer to IGC. At this phase, individual and its society have ability and capacity from adaptation and diffusion levels approaching ICTs innovative level. They are able to master ICTs knowledge for self and family life needs.

Phase 3 is in early majority level which is approaching IGC. At this phase, the individual and society are still in adaptation ability to diffusion. Innovative ability is not yet seen and they need time to be someone innovative. Technological ability is mostly influenced by factors of environmental and
social influence. Also at this phase, doers or actors starts to have ICTs diffusion force in their everyday live. However, features as innovator is still weak.

Phase 4 is end majority level namely society is still in early stage to progress as IGC. They can be said as still have lack of confidence with self ability especially in increasing diffusion and ICTs innovative ability. Their ability is still in ICTs adapatation stage.

Phase 5 is late phase and left behind in approaching progress as IGC. They are left behind as IGC which is whether they are still agricultural society, industrial society or mass society (Diagram 1). At this phase, there are individual or society that is still shy, technological blinded, pessimist towards ICTs, technophobia and left behind from recent ICTs growth.

4 Components and IGC Development Index

4.1 Humanware Component
Humanware component involves measurement of all measurement aspects that are related with capability and human skills whether in term of physical, spiritual, cognitive, creativity and psychology. This component focus on actor’s effort and intelligence in referring to creativity, analytical and practical aspects, for example, how far are their skills in computer usage, computer software and computer maintaining experience. All these depends on the doer’s effort whether to become a user who adapts ICTs, or diffuse in their everyday activities, or to become one who is innovative and high skilled in ICTs field. The variables are; X1- Ability to use computer, X2- Ability to use software, X3-Ability to create Web page, X4- Computer innovative capability, X5- Computer maintaining and servicing capability, X6-Computer virus detection capability. The capacity to detect computer virus as threat to computer system is the biggest asset for doer in IGC development. Variable X7- Ability to notice cyber criminal, X8- Computer skills and software course attendance, X9- Information Management course attendance (Burnett & Marshall 2003).

4.2 Technoware Component
Technoware component has variables that are related to ICTs facilities. Technoware consists of infrastructure and infostructure variables that are important to intelligence city development and IGC. Technoware is very essential because it is basic equipment to IGC development whether in shape of hardware or software. The variables are; X10- Computer quantity per household, X11- Computer capacity per household, X12-Modem capacity per household, X13- Internet facility connection, X14- Alternative internet facility, X15- Telephones quantity per household, X16-Handphones quantity per household, X17- TV property per household, X18- Radio property per household, X19- Fax machine property per household (Bakardjeva 2005).

4.3 Inforware Component
Inforware component is a component that involves all activities of collection, management, processing and info dissemination. All the activities use ICTs infrastructure and info structure facilities such as computer, compact disc, internet and e-mail. It is up to individual intelligence in using them. The variables are; X20-Newspapers purchase per household, X21- Educational reads purchase per household, X22- Magazines purchase per household, X23- Frequency referring to info in Internet, X24- Frequency of communication via e-mail, X25- Frequency observing market and share commodity in ICTs, X26- Quantity channel types of TV satellite, X27- Frequency of communication with international friends and X28- Activeness in dissemination and sharing info (Myerson 2001).

4.4 Valueware Component
Valueware component is value achievement aspect (axiology). Value said here is the value that does not contradict with local value. Although it is universal value but the use of ICTs infrastructure and info structure can be accepted in local level. The variables are; X29- Sensitive and careful with global changes, X30- Having metropolitan thought namely informative need from ICTs, X31- Technopreneur, innovative and creative Behavior, X35- Activeness and readiness in sharing information, X36- Cooperate in reducing cyber and computer crimes (Servon 2002).

4.5 IGC Development Index
Five levels measurement of IGC development socio-technology changes by Rogers (1995) and Rogers (1986) above use IGC progress index method. Index analysis is community development measurement method which shows social stratification (Avison & Harper 2002). Index classification also is the best method to measure individual achievement in IGC socio-technology change progress (Cano 2002). The vital of this socio-technology change classification index is it can contribute new knowledge and new
approach in seeing strata society socio technology change in individual level. Classification index analysis gives basic knowledge to review contents of latest technology change in individual level. All the actions with hope to give suggestions on how to study a technology impact to individual. It also gives space to use of other analytical techniques such as diagnostic technique, cost and interest analysis and strength analysis, weakness, opportunity and threat faced by IGC (Hussey 1987).

Important matter here is classification analysis IGC socio-technology index change not only looks at technology aspect but also at humanitarian aspect (Doherty & King 2002). This means impossible for technological progress to ignore ability and humanistic values. Therefore, technological progress must start from human progress in aspects of knowledge, thinking and their civilization mastery. This is professed by index studies which were done by any scholars (Lynch & Gregor 2002).

This study used one of the simplest index techniques which is IGC cumulative index analysis model. The formula was as followed:-

\[
\text{IndxIGC} = \frac{\text{Sum } n_1 - n_n}{\text{Sum } N_1-n}
\]

Where:-

\[
\text{Indx IGC} = \text{IGC Cumulative Index Value},
\]

\[
\text{Sum } n_1 - n_n = \text{Cumulative score value for each respondent (Achievement value), and}
\]

\[
\text{Sum } N_1-n = \text{Total cumulative score value (fixed value)}
\]

To determine IGC continuum, IndxMGB value will determine whether IGC position level is late (left behind), end majority (developing IGC), early majority (towards IGC), early recipient (close to IGC) and innovative (IGC). The determination depends on index score value which is gained by every respondent mainly as followed below @ equal to 0.20 as a late and left behind. If value 0.21– 0.40 as a end majority (developing IGC), value from 0.41 – 0.60 as a early majority (towards IGC), value from 0.61 – 0.80 as a early recipient (close to IGC) and value from 0.81- 1.00 as a innovative (IGC).

5 IGC Development Index in Subang Jaya, Selangor, Malaysia

IGC Development Index position in Subang Jaya is a systematic process result, suitable, just like its connection with Kantianism deontological philosophy and socio-technology theory of change which is discussed. A number of 127 respondents from middle class group are chosen as case study by using Taro Yamani sample method (Yamani 1967). In term of background aspect, most respondents are from Chinese race which is 51.2%, Malay race 32.3%; Indian race 14.2%, Bumiputera 0.8% and the rest are from other races which is 1.5%. This is because majority residents in Subang Jaya are Chinese. In terms of age, respondents in group 20-30 years (41.7%), age between 41-50 years old (26.7%), age above 51 years old (8.7%). Group of age between 20-30 years old is the highest as most of the middle class in Subang Jaya are newcomers. They have bought houses or renting in Subang Jaya area. In term of gender, majority respondents are male (59.1%) followed by female which is 40.9%.

Regarding education level, majority respondents in Subang Jaya have Degree (37%), followed by Diploma (18.1%) and then SPM (26.0%). That shows the middle class group which are chosen to be respondents in Subang Jaya have high educational background which is Degree and Diploma levels. Qualified SPM respondents is a middle class group that long appeared because of promotion, long service of work and achieve career advancement in highest level. As in job field, majority of the respondents in Subang Jaya works as professional members (32.2%) and management (20.4%) and remainder in other categories such as support (19.0%) and technical (12.6%). Among professional career and management field that are plunged are as engineer, architect, accountant, bankers and own company manager. What is important is majority of the respondents in Subang Jaya work in private sector (86.6%) and those who work in government sector was amounted 13.4%. Majority Subang Jaya respondents work in private sector because local company and MNCs companies are often found in Subang Jaya, Bandar USJ and Bandar Sunway.

On one month household income, majority respondents in Subang Jaya have one month income between RM1000 - RM2000 (44.9%), second majority between RM2001-RM3,000 (23.6%). If viewed monthly income between RM1000- RM2000 as if considered a low-income group in town. This is because town average monthly income for low-
income group at national level was RM1155 (Malaysia 2001). But if compound with total household monthly income between husband, wife and other family members, they are actually in group of middle class because exceeding RM1155 income just now. This is because to get total information on household monthly income is pretty hard because it depends on respondent kindness. In connection with that, this study only records roughly monthly income as permits by respondent. Nevertheless, cumulatively respondents who have more than RM4000 income is fairly high 21.3%. The highest respondent monthly income in Subang Jaya was RM17000. While minimum respondent monthly income was RM1000. Whereas respondents average monthly income was RM3026.50. This means respondent purchasing power in Subang Jaya is still high when this study is made.

The results shows of IGC index analysis according to Rogers scale. Analysis result has found that no respondent successfully achieve IGC innovative progress. However, respondents successfully achieve IGC progress in early recipient level (2.4%), early majority (63.0%) and end majority (34.6%). Also, no respondent progress decrease to left behind or late group. This means based Rogers scale, decision shows abnormal loop. This abnormal loop is produced because respondents are chosen only from middle class group. They have nearly identical ability and opportunity and not much difference. Analysis results also shows respondent in Subang Jaya is heading towards and developing as IGC.

6 Conclusion
In conclusion, IGC respondents’ progress is developing and heading towards IGC. No respondent reaches innovative progress level and none are left behind or late as IGC. Most factors or significant constant that affects IGC respondents’ progress in Subang Jaya is from valueware component. The importance from valueware component shows that development progress according to Kantianism philosophy is needed for IGC development. This is because from ethic and moral aspects, IGC development has certain processes which involve roles of an individual, group, society, country and also engage many sectors. However in reality, respondents in Subang Jaya have not yet achieved innovative IGC which contribute to ICTs growth. They are just IGC who successfully adapt, assimilate and diffuse ICTs in life for personal and family growth. Therefore, strategic steps need to be implemented by society and institutions in Subang Jaya to produce innovative IGC for the sake of reaching society growth by year 2020.

References: