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ASEAN IVO Forum 2016
Call for Presentations

Submission and Registration Form

Please enter the relevant information in the fields below, giving an appropriate explanation when necessary. You may add supplemental pages and supporting data. If necessary, you may be asked to provide additional documents.

I. Title—Title of presentation:

Emphasizing FoE UNHAS Smart Campus Roles for Creating the Neighboring Smart Societies

II. Author(s)—Full name (First name family name):
(If you are already planning a project, please include the names of all team members)

ELYAS PALANTEI, M.Eng., Ph.D AND JK-COT COLEAGOUS UNHAS

III. Organization(s):
(If you are already planning a project, please include the institutions of all team members)

JK-CoT – Center of Excellence for Applied Intelligent Technologies
Faculty of Engineering (FoE), Universitas Hasanuddin (UNHAS)
South Sulawesi Province, Indonesia

IV. Topic selection:
(Select one from the topics listed in "Call for Presentations")

Smart Community and Smart Village

IV. Abstract:
(Describe the purpose, background, objectives, content, plans for connected projects, expected results/outcomes, etc.)

Explained in the attached file of the outlined project

V. Speaker information:

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VI. Support for speaker—circle or underline any that you wish to request:

- Round trip fare at discount economy class
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Emphasizing FoE UNHAS Smart Campus Roles for Creating the Neighboring Smart Societies

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1. Introduction

Interaction between nations globally is currently being experienced by the entire human race throughout the world. It is one of the important factors that must be anticipated by all elements of Indonesian society from all strata of life, such as various education levels; cultural background, religion and belief; and the differences in levels of economic fundamentals, which spread from urban area to rural areas (villages). The impact of the current globalization pressure, can have very positive for the accelerated improvement of the living conditions of the people in Indonesia if the efforts of proactive, innovative and sustainable can be contributed from many elements of intelligent "young generations" living in Republic of Indonesia. If these steps do creative, innovative, tactical and strategic nature undertaken by various stakeholders, such as government, the educators and researchers, as well as the industry, both in the national and local levels respectively, less successfully formulated and executed on the ground in anticipation of various tendencies models of cooperation international level it is certainly negative influences that could very potentially occurred. The negative impacts must be reduced consistently.

A proactive and sustained role contributed from across the community of higher education institutions, especially educators and researchers (working in all levels of the undergraduate and postgraduate programs), under the support and harmonious cooperation of the two essential elements, i.e. government and industry are the key to success and become a bulwark in anticipating and adapting all the potential negative effects of globalization. The availability of human resources (HR) were plentiful as well as the quantity and quality of infrastructure and support facilities at the university that can be optimized utilization surely would enable it to various studies and the development of science and technology applied. It can also be formulated and adopted directly in the related fields in community. In addition, the results of innovation and studies are later expected to be useful for the improvement of their living standard and expanding the horizons of thought and insight knowledge of the Indonesian people who are in the midst of competition life among nations / countries as the most competitive as AEC (ASEAN Economic Community), APEC (Asia-Pacific Economy Cooperation), AFTA and many others. To achieve the target that lofty goal can be constructed and the process is expected to be implemented for the time interval is not too long.

As a center of excellence in the field of innovation regarding the construction of the varieties of leading edge and applied technologies performed in Jusuf Kalla Center of Technology (JK-COT), Faculty of

Engineering, Universitas Hasanuddin (which is currently located in the newest Engineering Campus Jl. Poros Malino, Gowa, the Center of Excellence for Applied Intelligent Technologies (CoE-AIT) are expected to have significant contribution to the local vicinity villages as well. With big young scholars community are working hardly in the center as an agent of Development (AoD) and agent of change (AoC) has vowed internally to a professional, committed and dedicated staffs in taking the role and strategic position in many research projects (R & D) and implementing various applied technologies which are smart and environmentally friendly. These are one of the many efforts to contribute to build and to perpetuate the better condition of Indonesian society. To achieve this great goal many sectors of life are supported and characterized by advantages availability of innovative and applied technologies. As one of the dynamic centers of excellence CoE-AIT in UNHAS will formulate, construct and implement a prestigious project under the coordination and cooperation of the management of JK-COT. Innovative and applicative project that is scheduled intensively to commence at the early of 2016 is named "Green Campus and Smart villages".

Referring to the use of the term the very interesting and challenging R&D projet "Green Campus and Smart Villages" has very clear targets. The main goal of the prestigious project initiation at the Faculty of Engineering (which is planned to run for several years or multi-years of R & D and implementation phases) are expected to be achieved. Project assessment, development and implementation of various applied intelligent technologies that will be installed and operated in the area of Campus Techniques Gowa and the residential neighborhood is in a form of synergy of expertise of various fields of engineering science that is currently the R & D activities featured on a number of laboratory-oriented education (teaching labo) and research-oriented laboratories (research labo) spread over 13 study programs in the Faculty of Engineering UNHAS. There are a number of issues featured strategic importance that will be performed in the R & D project "Green Campus and Smart Villages". These are highly expected to emerge as appropriate and practical solutions to address some classic problems experienced the surrounding local village area. These are particularly may have the positive impacts on the governance operational and creating the better climate of education and research, both in the Campus Engineering Gowa and higher education institutions and other secondary schools spread around campus. Besides, also, the specific R&D project that desperately need for the active contribution of many elements of intelligent and potentially academics Engineering Faculty of Hasanuddin University, would be a real model (pilot project) of a concern elements of the propulsion and fighters education / research in collaborating and cooperating in harmony with the various authorities and other relevant (including the respected government and industry) in community development smart villages program (remote people) are more complete, God willing. In the process of implementation of programs of structured work that has been formulated and assessed accurately by a team of highly qualified and dedicated hoped that the process of transformation of life more dignified and modern, both within the campus and surrounding communities, will have implications are very significant and positive improvements the quantity and the quality of life of beings and ecosystems are being targeted as well as the implementation of the various smart and environmentally friendly technologies.

In the life of communities that adopt the principles of "Green Campus and Smart Villages" such as the easy access to the various services of sustainable energy sources will act as a catalyst for the

development of local surrounding area, provides highly potential opportunity for the provision of education and health services in very good manner, easy access and reliable on the sources of clean water, the quality level of sanitation and nutrition, growth and acceleration economical business units are increasing to strengthen the fundamentals of the economy of the surrounding community, increasing the degree of safety and comfort of staying in a residential area and its surroundings, gender equality and the practice of democratic life of dignity. Various results of research and development (R & D), which so far have been or will be done while the product icon of excellence in the implementation of the project "Green Campus and Smart Villages", may include:

a. Utilization and conservation technology includes utilization and conversion of natural resources around to provide the sufficient environmentally-friendly electric energy generation;

b. Assessments and the implementation of smart grid technology for distribution and management of electrical energy that is smarter and more efficient, especially those in practice will be optimized electrical energy consumption management mechanism uses rechargeable smart card technologies;

c. Innovations and development of various smart card applications for a wide range of holistic applications, both within the college / high school as a system of an integrated academic services by utilizing one student card for the whole academic services include lectures and information management systems of smart classrooms, smart assessment, and reliable students monitoring mechanism; development and application of smart card applications for library services and smart parking system in every local community.

d. Through the course of a real and active role beings campus that also had its share in the success of and in cooperation with local authorities and supported by a number of industries and BUMN the " digital village environment (established digital remote society)" very concerned about the actions for the environmental sustainability work program will be the issue of very interesting and challenging development.

e. To further improve insight and expand the capabilities of the business / enterprise pilot communities living in the area around the campus Techniques Gowa through a number of concrete programs on utilization of ICT technology in a more optimal, both for the purposes of education and business / potentially creative jobs, transformation of well being mindset and behavior to whole digital village societies. Some applications are loaded with moral messages can be accessed within the digital villages areas and the environment.

f. Center of Excellence for Applied Intelligent Technologies (COE-AIT) in the R & D project "Green campus and Smart villages" will be focused on a number of studies and implementation of various waste processing technologies (both categories of organic and non-organic) are produced every day in the Engineering Campus, Gowa Regency and in the neighborhood residential communities. Many mechanisms of technical and non-technical will be a serious issue to be followed up, including methods of rubbish recycling-friendly environment, the system of power generation using wasted energy resources such as elements of waste products from humans and animals and many others, technology composting and other type of waste.

2. Concept of Green Campus and Smart Villages R&D Project

The surrounding natural landscape of Faculty of Engineering is still relatively newly built and is located in a beautiful area with various interesting sightsseeing objects such as river Jenneberang, a number of cluster areas hills included in the mountains Bawakaraeng, artificial lake DAM Billi-Billi, exoticism of modern campus yet seem beautiful, residential area of society that can still be arranged better, soldiers barrack “Pakkatto” and many more, is a tremendous potential in creating environmental conditions to be well managed and organized in a more modern and a sustainable.

Adopting a model of the development of "green campus and smart village" in some countries that continue to experience rapid growth, there are some important things to be the main factor that will determine the success of development projects of both smart FoE Unhas campus and local communities in a targetted area. These include the issue of food security, social and political issues, issues of health and welfare, the education sector and the interests of local businesses. However, in several studies and projects of development of "green and smart village" issues of energy security becomes a central concern to consider in the life of the community while also the urgency of the issue of environmental sustainability is no less interesting and challenging. Related to the last two important issues, just previously described, will be mainly related to the concept of implementation mechanisms and techniques of processing the waste (garbage litter produced in the campus and residential); water recycling processing techniques that can be utilized for watering gardens, productive and economic value of orchards; various applications of the latest intelligent technology and applicable related to conservation and conversion programs of the new and renewable energies for the benefit of all residents in the vicinity. One model structuring the region that will adopt the concept of "green and smart campus for creating the smart villages" is illustrated in Figure 1.

Figure 1. A Specific model on maintaining the smart and friendly environmental life adopted in the FoE UNHAS smart campus and the surrounding areas

The most prestigious project in the R & D activities to develop "a Green and Smart Campus for creating the smart villages" will basically combine the potential advantages of intelligent technologies and its corresponding applications implemented and methods of environmental planning in harmony. The similar methods such as utilized on the smart village project developed by Siemens Inc. and a pilot residential community in the State of Russia. These two referenced comparison are seen in Figure 2 and Figure 3), respectively.

Figure 2. A particular model for constructing and maintaining the smart and green environment developed by Siemens Inc.

Figure 3. A particular model for constructing and maintaining the smart and green environment developed in Russia.

3. Smart Card Utilizations in Digital Village Community

The concept of R & D project "green campus and smart village" is a vision of regional development Engineering Campus UNHAS and settlements surrounding community located in Gowa district that will integrate a wide range of solutions application of leading edge technology and applied intelligently based on ICT (Information and Communication Technology) and IOT (Internet of Things) in a format management of assets within the township for example, the information system of local government, high schools and colleges, libraries, transportation systems, health centers and hospitals, new and renewable electrical power plants, a clean water supply network, central management of waste and other waste material, law enforcement units, and various types of other community services. The main objective of the project development of "green campus and smart villages" is to improve the quality of life of the campus and surrounding villages by optimizing the supported and availability of applied technology intelligently developed at the Center of Excellence for Applied Intelligent Technologies, JK-COT, Faculty of Engineering, University of Hasanuddin. In practice, the application of innovative technologies that could answer some of the problems of the campus community and surrounding areas such as the use of applied technology and information technology in society is expected to improve the efficiency of its services and meet community concerns. Implementation varies ICT technologies that have been developed on campus will provide great opportunities to the authorities either on-campus or residential areas around it to interact directly with their respective societies in order to optimize the use of shared infrastructures provided for the benefit of the common good and to monitor regularly the events surrounding what happened, how intelligent life in the township area evolved and transformed, and how together the men and women settlers in the neighborhood "green campus and smart villages". Through the application of sensor network technologies integrated with other systems of real-time intelligent monitoring, data / information will be collected from the location of people via the electronic device, for examples, each smart phone or more other electronic communicator devices -then the data is processed and analyzed in the center monitoring unit. Information and experience of the events that are collected are the keys to overcoming the problem of inefficiency in public services.

As described earlier that many relevant sectors to be prioritized for inclusion in the project development of "green campus and smart villages" including various numbers of the government services, intelligent transportation (i.e. smart transportation modes, smart Pete-Pete cars/ smart mini busses of local Makassar city) as well as management systems, energy security issue, health services, water supply and recycling, community management and Village farming systems, and waste material management and so forth.

The use of electronic card technologies or better known as the smart card is another common platform in the development of "green campus and smart villages". These cards have a unique encrypted ID that allows the owner to access different types of services without doing a lot of set-up the individual accounts. With only one smart card to which every member of the public can access and get the kinds of services needed in more effectively and efficiently. Various product innovations on campus have been

developed regarding the use of Smart card technology for application-deployments in local villages communities on later stages R&D projects could include such as:

- Service Library (E-Library)

- Payment Transactions of meals/foods

- Transaction Services for Intelligent Parking System

- Integrated Academic Services systems include smart classrooms to support the lecture / lab operational to be more intelligently, smart assessment and on-line monitoring system of student activities

- Applications for smart card management and operation of various modes of transport in an intelligent transport network and the mode of its use in the construction of smart pete-pete

Some of the product illustrations belongs JK-COT, Faculty of Engineering, under the coordination of the Center of Excellence for Applied Intelligent Technologies are described below. There are many other platforms while the application is being developed and will be very potential to be integrated in the project "green campus and smart vilages". There are three types of smart card applications which will be described below for application services including a smart and high secure parking system, medical services and library services. All smart card applications are shown in Figures 4, 5, and 6 below.

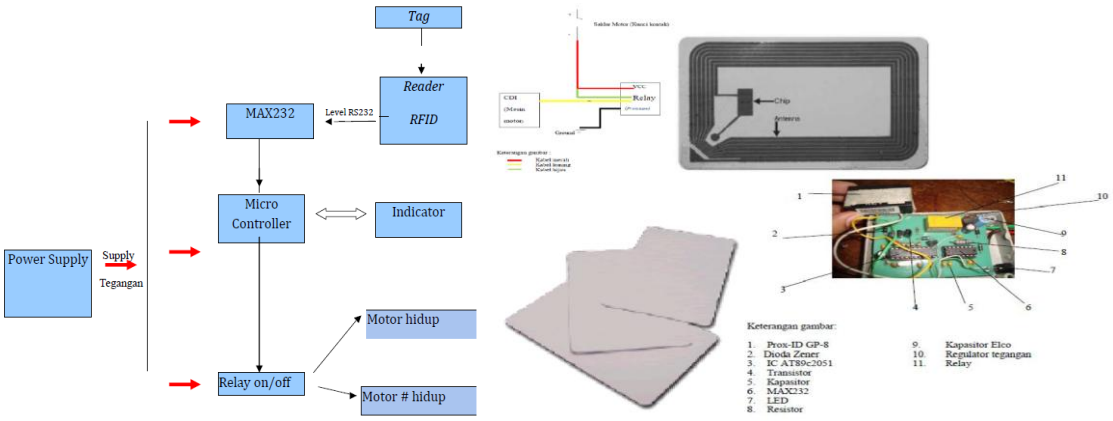

Figure 4. A typical configuration of vehicles security system based RFID installed at smart parking area

Figure 4 above is a prototype RFID-based security vehicles to address vehicle theft forcible action to protect it using a smart card programmed. This prototype incorporates a typical RFID system consists of a reader circuit (Prox-ID GP-8) were modified and a passive tags (EM4100) who works at a frequency of 125 kHz which has the concept of a compact, inexpensive, and flexible.

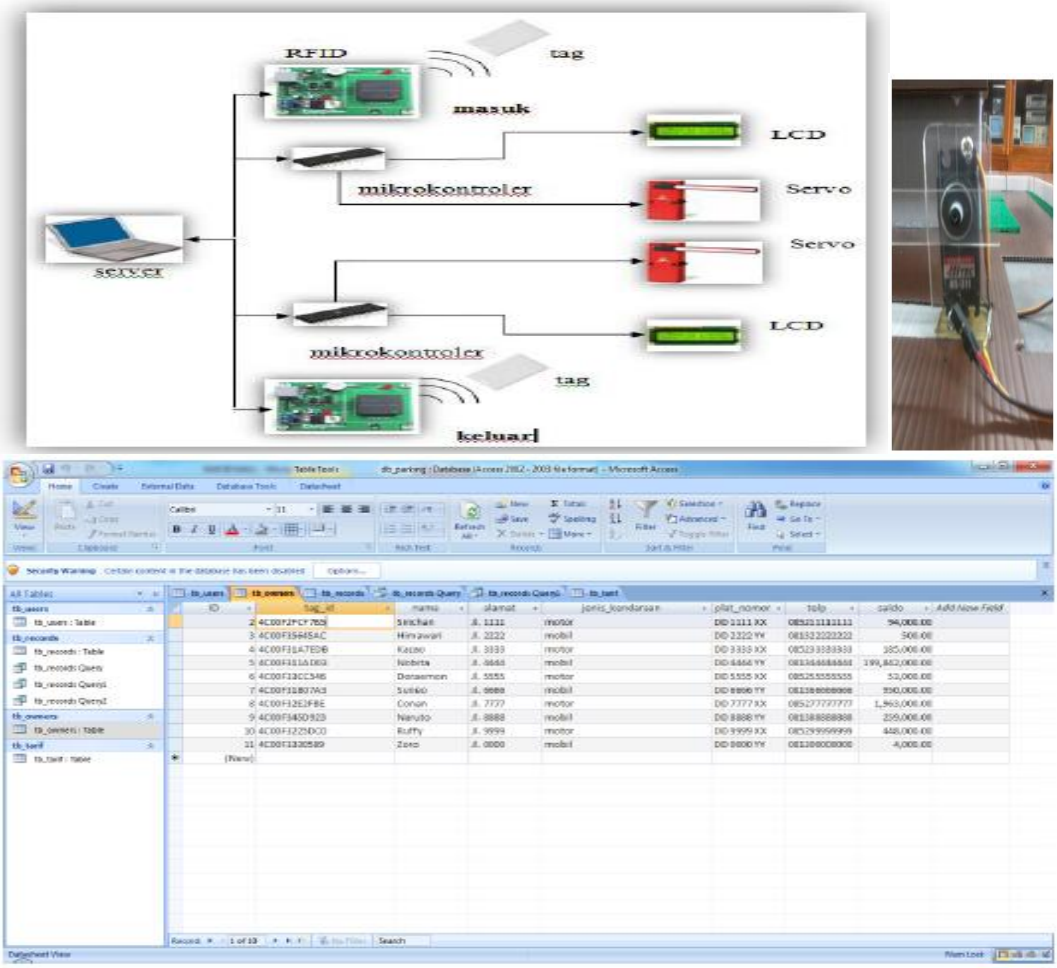

Figure 5. The hardware and software integration implemented on smart parking system

Figure 5 above is a miniature model of the mall parking area is connected to a server with automation systems RFID smart card-based financing. In addition, the system screen to view balance and transaction time, use LCD (Liquid Crystal Display). And for limiting use servo crossbar. Because using the LCD and servo, the tool is also supported by the use ATmega8535 microcontroller. It is expected with the use of these tools, can assist in the ease of paying for parking more convenient, simple, and does not take much time. Many benefits have been achieved in this study, in addition to making transactions easier, RFID is also used as a substitute for cash in the transaction process. The use of RFID in managing the park provides significant advantages when compared to barcode technology. Design begins with RFID to enter data in a database and will be used to display data in LCD and servo moves. The process of researching the automatic parking transaction includes entering time entry and exit time users to calculate the amount of the transaction costs that must be paid when using the service use the parking area. In the testing phase, the system can work well and can be represented by the RFID readings were not wrong. The output of the system is identified by an LCD capable of displaying user data, as well as the Servo function in accordance with a command from the microcontroller.

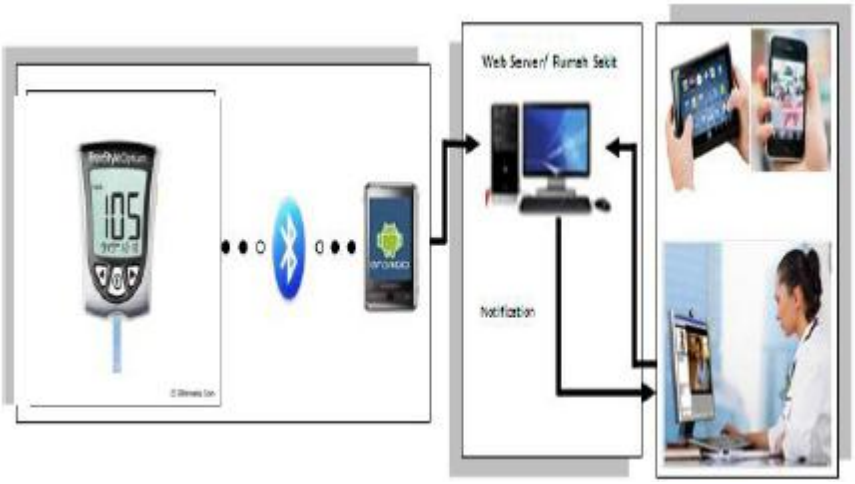

Figure 6. A typical real-time blood sugar monitoring system

Real-time measurement of blood sugar is very important to know the condition of every patient suffering diabetes mellitus disease. These measurements were performed using a glucometer associated with arduino and bluetooth so that blood sugar measurement results can be sent to mobile phones. Through this phone is expected measurement results can be monitored by medical authorities mobile devices. During the process of sending data from the measurement results to the mobile phone glucometer made observations on the percentage of errors (error) value of the measurement results. Based on observations obtained error value amounted to 33.33% for observation for 60 seconds and the error amounted to 32.43% of observations for 120 seconds.

There are a number of telemedicine applications who has managed or being developed by researchers at the Center of Excellence for Applied Intelligent Technologies, JK-COT Faculty UNHAS. These includes real-time febris monitoring systems, telemedicine network suitable for isolated archipelago within Indonesia, an early detection of breast cancer systems and many others. An important key smart card use here more related to aspects of log-ins and medical services fee transaction on utilizing the broad access and high secure of telemedicine system and any other payment model when on-line consultation between doctors and patients has been performed.