

IMPLEMENTATION OF SMART DEFENSE BUILDING IN ZENI UNIT CONSTRUCTION CAPABILITY

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ABSTRACT

Smart defense building in the construction capability of engineering units is a necessity that must be immediately implemented in supporting military operations other than war (OMSP) both military and non-military activities in order to face the challenges and threats of the arena in the modern world which is increasingly not limited by space, time and form. The purpose of this research is to examine the implementation of smart defense building in the construction capability of the engineer unit and the concept of smart defense building for National Development. The concept of smart defense building for National Development is a construction engineering that is integrated with IT advancements, which must be mastered by the Zeni Unit in order to carry out future construction tasks, for its implementation. The concept of smart defense building for National Development requires the synergy of Ministries/Institutions and other parties. related and integrated with Scholars, all Civitas Academica, Stakeholders, NGOs, the Defense Industry and BUMS to realize an Advanced Indonesia.

Keywords: smart defense building, construction, Zeni

PRELIMINARY

Background

The original concept of Smart Building, developed by real estate developers who created “a new generation of buildings that think for themselves”. Smart Building is a marriage of two technologies, namely ancient building management and tele-communications (Sinopoli, 2010).

The ultimate goal is to provide smart buildings, namely buildings that are designed or renovated with intelligence (smart design) using the best typology (smart shapes) and technological solutions, both from the construction (smart envelope) and equipment (smart system) point of view, capable of intelligent interaction. with the environment and users (smart people) to provide, with very low use of natural resources, an accessible, safe, comfortable and healthy built environment, capable of improving the lives of all the stakeholders involved (smart environment, lives smart, smart economy, smart city). (Casini, M. 2016: xvii).

Smart buildings are buildings that are designed with a combination of technology and the use of local environmental wisdom and harmonize with building functions that are packaged in modern technology with ease of use, maintenance, and provide a sense of security, comfort, and health, which are integrated in a control system.

In terms of architectural design, a building is constructed according to its intended function, known as the term "form follows function". Form follows function was introduced by American Architect Louis Sullivan in the 20th century. In modern architectural theory form follows function is an architectural theory which states that the purpose of an object or building is the most important, so a design must be followed in order to maximize its purpose (Gray, T. 2013). The principle of building form follows the function in terms of defense factors, so smart defense building is defined as a smart defense building, in the context here it is a building that is smartly designed to support defense functions and or smartly designed building architecture as a public facility but if in an emergency situation it can be used as a defense function. This means that the smart defense building design concept plays a role in supporting military defense in carrying out OMP (War military operations) and OMSP (Military operations other than war) tasks.

Smart defense building is a combination of science and technology that combines several disciplines, especially architecture, civil engineering, electronic engineering, environmental engineering, defense science, defense civil engineering, defense electronics engineering, military engineering engineers, which are integrated and collaborated into building design concepts. defense, which is in accordance with the function to be accommodated, with advanced technology, easy to operate, safe, environmentally friendly and healthy, both in buildings for military and non-military defense functions.

The smart defense building design concept for military defense means designing a building for defense functions, both to support war military operations such as defense fort buildings, munitions and explosives warehouses, military supply warehouses, observation towers, etc., as well as buildings to support military operations other than war such as dormitories, offices, educational facilities and infrastructure, etc. The Indonesia Army unit that has the ability to design a building for a defense function is the Army Engineer unit. TNI AD, Indonesian National Army engineers have 9 (nine) engineering capabilities, namely: investigation, construction, obstacles, crossings, fortifications, water and electricity supplies, destruction, explosive disposal, nuclear biology and chemistry (Nubila). Faced with smart defense buildings, how to build smart defense buildings, the ability of engineers to become leaders is construction capabilities that are integrated with engineering investigations, fortifications, water and electricity supplies, nubika, and destruction.

Problems

The urgent research problems are;

- 1) What is the condition of the engineering unit's construction capability?;
- 2) How to implementation of smart defense building in engineering unit construction capabilities?
- 3) How is the smart defense building concept as part of the engineering unit's construction capability?

METHOD

The research uses qualitative research methods, namely the type of research where the researcher is very dependent on information from the object/participant on: a broad scope, general questions, data collection which mostly consists of words/text from participants, explaining and analyzing the words and do research subjectively (Creswell, 2008: 46).

For data collection using the literature method, which according to Bungin, B (2008:121) and reinforced by the opinion of Sugiyono (2005:329) which states that literature is a record of events that have passed in the form of writing, pictures, or monumental works. From someone.

RESULTS AND DISCUSSION

a. Smart Defense Building against the National Defense Strategy

A smart defense system of a building or building, meaning that with advances in science and technology, the building can carry out the function of defense from threats and disturbances, effectively and efficiently utilizing existing natural resources.

With the spread of the industrial revolution 4.0 in all sectors of life, even in Japan, it has spread to Society 5.0, the striking changes that occur are the use of robotics and digitalization as well as cyber culture in everyday life, so that advances in science and technology and social culture will also affect the shape and form of social culture. future threat and war patterns.

The unstoppable development of science and technology, the development of internet technology/virtual world plus social media which makes information can be sent quickly and widely without limits. The competition for cyber capabilities and technology developed into cyberwarfare, and then further developed into irregular warfare, a war that is without form, without space and time, which threatens and challenges all people in the world.

The threat dimension no longer comes from a country, threats to the country can come from groups, even from individuals, it is enough to shock a country and even the world, whether it is a military threat or a non-military threat that affects national defense.

External defense is active defensive, not aggressive and not expansive as long as national interests are not threatened, Indonesia is not bound or involved in a defense pact with other countries. Active defensive defense is realized by prioritizing diplomacy through a free and active foreign policy as a line of national defense (BPPI, 2015:52). Defensive defense physically means we survive, for that we need a formula that is able to provide deterrence and prepare a defensive infrastructure and defense architecture, providing a sense of security and comfort.

Active defensive defense in the face of military threats, is carried out through diplomacy to prevent other countries' intentions to attack or threaten national interests. Active defensive defense in the face of non-military threats by Ministries/ Agencies outside the defense sector is carried out through the preparation of regional potentials to become defense forces. Active defensive defense in the face of hybrid threats is carried out jointly with all components of

national defense through an integrated and comprehensive approach to military defense patterns.

Defensive defense physically and technically is defensive defense that can create fear, among others, namely the ownership of defense equipment (the main tool of the weapon system), the domestic defense industry which is capable of producing independent defense equipment, and defense infrastructure facilities, so that other countries are reluctant to carry out attacks.

A layered defense strategy is implemented and developed to counteract, overcome, and overcome various types of threats, which synergize military defense and non-military defense. (BPPI, 2015:53) The synergistic form of merging military and non-military defense is contained in the Smart defense building concept. Smart defense building is designing buildings by utilizing technological advances and construction technology so as to create a multi-functional defense building design:

1. If in military terms, the military building is at the same time a defensive fort or equipped with fortification bunkers or other things that function for the defense and security of the wearer and the equipment it contains.
2. For example, the Koramil building on the border, in addition to guarding and securing the border area, if attacked by the KSB can protect the person on duty, even if it is possible to give a counterattack, so that TNI members who are on duty in that place are sure of the safety of their lives;
3. If according to non-military rules, it means a purely civilian building which in an emergency situation can be used for non-military defense functions, for example, a village office building, in an emergency situation it can be converted into an emergency hospital, public kitchen, shelter camp, where the infrastructure facilities and equipment and supporting equipment are ready. Considering that Indonesia has a greater threat of earthquakes than physical contact wars.
4. Implementation of Smart defense building development, ideally carried out self-managed, starting from the planning and design stages, up to the implementation of its construction in order to obtain maximum results and efficiency as well as confidentiality factors;
5. Units capable of realizing self-management of the development of Smart defense buildings are the engineer troops, because they have construction capabilities, water and electricity supplies and engineering investigations, but regarding technology, they are given preliminary briefing or ToT (transfers of technology), if necessary, a merger with competent units.

b. The concept of Smart defense building for future national development as part of the engineering unit's construction capability.

The concept to realize the national development strategy in the construction sector today is Smart defense building for future national development. It means realizing smart defense buildings in the national development program for the future, which is contained in the RPJP, RPJM, RPJP because "defense is an investment".

Smart defense building, it can be interpreted that state defense buildings that support the military defense system are designed with smart/smart buildings, and buildings which, due to their strategic functions for the interests of the state and nation, are equipped with defense building functions and pure (non-military) civilian buildings that accommodate human activities. many, equipped as non-military defense buildings.

In order to formulate the concept of Smart defense building for Future national development, in general, it is necessary to sit down together between K/L policy makers (Ministries and Institutions) and the Academic Community and Politicians, in order to formulate a national development policy concept that is oriented towards national defense, and technically with involving the Defense Industry, relevant stakeholders to formulate technical designs as guidance in implementing smart building technology and defense buildings in Indonesia's national development / Smart defense building for Future national development.

1) BAS (Building Automation System)

- a. Heating, ventilation, air conditioning, heating, air ventilation and air conditioning are designed automatically by maximizing the utilization of the natural conditions around the building so that an energy-efficient and environmentally friendly system can be achieved;
- b. Lighting and Electricity, utilization of natural sources such as the sun with solar cells combined with a lithium battery, automatically between energy storage and use and reserves, so that the source of electricity can be independent, not using PLN (State Electricity Company), in the lighting system a light sensor is installed, so it is automatic on and off according to environmental conditions;
- c. Water/Drink, equipped with the use of natural resources, one of which is rainwater harvesting, harvesting rainwater by draining and storing rainwater, to then be used for MCK (bathing, washing, toilet) purposes and processed for drinking water, so it is safe from possible sabotage. Automation of water treatment systems and drinking water distribution;
- d. Gas, for cooking to maximize the gas that comes from the processing of feces and urine of the occupants, so that it is effective and efficient as well as environmentally friendly.

2) Telecommunications

- a) Wifi / Hotspot area, Local Area Network, Internet, namely a communication system utilizing the Internet, wifi / hotspot, Lan, which is limited by a layered security system;
- b) Cable TV, utilization of cable tv for sources of information and entertainment as well as limited learning, for building occupants.
- c) HP/HT/SSB, other means of communication are landline telephones, HP/HT/SSB with use as needed by considering the effectiveness and economic efficiency of logistics;
- d) Telex and Morse, equipped with telex and Morse communication tools to anticipate unwanted things; and

e) Audio Visual Systems, a communication system that displays images and sounds virtually so as to reduce the level of intrusion, whether intercom, telephone or CCTV.

3) Fire fighting system is one of the fire fighting systems used for buildings so that fire disasters can be overcome, including:

- a) Fire alarm systems;
- b) Fire Hydrant System;
- c) Fire Sprinkler System; and
- d) APAR, Light Fire Extinguisher.

4) Security system

a) CCTV, a security system by utilizing CCTV installed in strategic places, in order to monitor the situation and the surrounding environment;

b) Drones, are complementary to CCTV if there is something suspicious, drones that go directly to the crime scene (scene).

c) Access Card, access in and out by using a card, if necessary, complete with a password, finger print and/or face/eye scan.

d) Night eye, for the night watch team equipped with night binoculars, and drones equipped with sensors / night eye cameras;

e) Sensors, temperature, distance, speed, smoke, poison and others that support the security system; and

f) Radar (Radio Detection And Ranging is an object detection system that uses electromagnetic waves to identify the distance (range), direction (direction), or speed (speed) of objects. electronic warfare) as ESM (electronic warfare support measures), is very vital in the national defense system as eyes and ears to monitor objects that can endanger regional safety.

5) Defense system

a) Fortification, a fortification in a complex or building equipped with a space that functions as a rescue bunker, meaning that it is able to withstand limited fire, limited nuclear attacks, equipped with anti-jamming, personnel and cyber radar. Doors and windows are installed with anti-radiation and poison detectors, if they smell it will close and clean the air circulation automatically.

b) Building Materials

(1) fortifications are composed of materials, which are designed to withstand the fire of sharp munitions of 5.56, 7.62 to 12.7 mm caliber, or are coated with resistant steel plates that are able to withstand the fire of these weapons;

(2) Smart material, defined as a material that has properties that can be changed or regulated by using external influences. An example of the use of anti-jamming materials. Examples of other uses of smart materials are:

(a) Material to give effect according to the surrounding environment/disguise is quantum stealth;

(b) Walls using force fields, invisible walls; and

(c) Iron Dome air defense, a kind of magnetic field that surrounds and protects buildings/areas from enemy fire and radar.

c) Logistics/Store room, there is a space for storing weapons and munitions, food and drink in a certain amount, including masks and O2 tubes, communication tools, clothes, blankets, bags, and other supporting equipment, which are renewed within a certain time limit ;

d) Disguise equipment, either in the form of manual/physical disguise, or electronic with a hologram, so the installation of military buildings when viewed from the air looks like a hospital or other civilian building.

e) Access to go off / Emergency Voice Evacuation, the existence of an evacuation route to a safe place, hellypad, secret passage leading to a safe place;

f) Drone as weapon, has a drone as weapon unit, meaning that it has drones that can function as investigators and weapons, which automation is able to protect users;

g) Armament, that the building is equipped with an armament system that is controlled from the control room or car by the user. Starting from the caliber 5.56, 7.62 to 12.7 mm and rocket launchers and drones as weapons of course; and

6) Facility Monitoring system

a) Energy management, energy use is regulated digitally starting from charging, storing, distributing, using and filling reserves automatically.

b) System utility, good piping system for distribution of clean and dirty water as well as drinking water, is well controlled.

c) Management Defense and Security System, between security and defense systems integrated and synchronized in control and their use supports each other according to the needs that occur in the field.

d) Power Supply System, which is digitally regulated starting from charging, storing, distributing, using and automatically syncing backups between solar cells and lithium batteries with their backup.

c. Concept of Smart Defense Building for the Zeni Unit (Combat Enginnering).

Smart defense building is the science of designing defense buildings for their needs and functions, by equipping them with advanced technology, which is easy to operate, safe,

environmentally friendly and healthy, both in buildings for military and non-military defense functions, which are ready to be used for national defense functions at any time needed.

Construction capabilities of smart defense buildings are all businesses, works, activities and actions to manufacture, repair and maintain military buildings (combat construction and non-combat construction) and non-military buildings by utilizing hi-tech (high technology) and using smart building technology to be applied. In defense so that smart defense building is achieved.

Engineer units in general can be involved as an element of combat assistance as an element of combat assistance and administrative assistance by organizing the construction of smart defense buildings to provide protection, provide, carry out maintenance and repair of construction facilities of smart defense buildings in the concept of strategic and tactical use both to support military operations war and military operations.

In military operations of war (OMP) and military operations other than war (OMSP), the Zeni Unit organizes construction capabilities in the field of smart defense building including:

- 1) Build, carry out maintenance and repair of airfields, heliports and docks, according to the existing smart defense building design;
- 2) Construction of fortifications/ protection construction according to the existing smart defense building design;
- 3) Making construction facilities for Command Posts, Headquarters according to the existing smart defense building design;
- 4) Manufacture of artificial construction to mislead the enemy and also use intelligent materials, and holograms, to avoid detection by enemy radar; and
- 5) Construction of water and electricity installations that support smart defense building designs.

d. Implementation of the Smart Defense Building Concept for the Engineer Unit.

The application of the Smart Defense Building concept in military buildings needs to be realized even though it is not perfect or only partially because it is for the sake of comfort and safety in carrying out state duties, considering the following examples of events:

“A shootout between the Armed Separatist Criminal Group (KKSBB) and the TNI took place again on Thursday (31/1) in Mapenduma District, Nduga Regency, Papua. As a result of the attack on the TNI post, Prada Laode Majid suffered a gunshot wound to the right shoulder.” (news. detik.com Thursday, 31 Jan 2019).

Based on the above incident and regardless of the situation and condition of the soldiers' preparedness as well as the dynamics in the field, in terms of architectural design as a defense building, the TNI post building should also be able to function as a defensive fortress, capable of protecting and providing a sense of security for soldiers. , so that TNI soldiers are more confident in carrying out their duties.

According to Hamilton T, A (2019), that military architecture is a fortress built by the authorities as a military stronghold (as a military stronghold) as well as a temporary residence. In line with that, the smart defense building concept will provide fresh air for TNI soldiers because apart from being safe and comfortable, it is also equipped with reliable technological advances.

CONCLUSION

The construction capability of the engineer unit is implemented in support of military operations other than war (OMSP), both military and non-military activities. In the face of national development, the Zeni Unit is the backbone of the country in the construction of roads along the National Border, but faced with the development of science and technology, the Engineer Unit needs to improve its construction capabilities, which collaborate with the development of modern science and technology and be integrated with national development programs and related Ministries and Institutions.

The concept of smart defense building in the construction capability of the engineering unit is a necessity that must be immediately addressed by the young generation of Indonesia, especially the Army Engineer Unit in facing the challenges and threats of the national and state arena in this modern world.

The concept of smart defense building for National Development is the engineering of future opinions and ideas, whose implementation requires the synergy of Ministries/Agencies/Institutions) and other related parties who holistically agree that “defense is an investment” so that it is integrated with Scholars, all the Academic Community, Stakeholders, NGOs, the Defense Industry and BUMS to create an Advanced Indonesia.

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