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Original Article

Management Architecture of the Intelligent Building

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ABSTRACT

In 1970, the arrival of computer and telecommunications technology, human life has changed the evolution of the theory that even their forefront of this technology was surpassed. Since 1990, individual and social life, with the arrival of computers and telecommunications and the sense of distance, has many variations physical places and definitions, just like the human face has changed over time. Rooms for meetings and conferences have taken a virtual form. Because many of the elements and physical components, they have been replaced by computers. This is what we call true unity among the capabilities of computers and the physical world we know. Combining the physical world with computers allowing us to provide the world with a computer brain thinks.

Keywords: Technology, Computer, Physical Places.

Introduction

Today, its buildings are kind of technology. They adapt their technology, and they are of interest. Buildings and structures as soon as the computer's ability to learn, are smart. The first intelligent building technologies for providing safe, comfortable and energy use. The idea of an intelligent building, connection between access, lighting, security, monitoring, management, and puts forward a remote connection. The integration, the system provides the ability to be able to exchange information among them. Exchange of information between these systems that makes the end result is the same output, without causing any disruption to be done. The output information systems or decision of the receptors, are accountable systems that respond to information received from various sources into the system, are provided. Data output (output) and decision systems, the most important and most necessary component in this architecture is called Architecture held accountable are.

This paper is a general study on smart architecture discusses the issue of when a "responsive architecture" and "architectural movement" will become intelligent architecture.

Definitions of intelligent buildings

Introduces the concept of intelligent buildings give and take and exchange

information among different parts of the building are strong and perfect. The term "building units", all modules that play a role in managing the building will take. Sectors such as HVAC, mechanical parts, construction, access control, security management, lighting, maintenance, LAN and power management. Intelligent building management and control of parts of a building used by computer users the ability to meet their needs. Needs may include effectiveness, utility and energy, entertainment, creating joy and happiness, comfort, return on investment and low cost of living. So there is no need to define an intelligent building and aims to successfully connect many were very special. The definition of success and goals of the position to another and changes with different people have different definitions. An intelligent building is the same function to be able to answer the needs of different and diverse.

Scientists word "intelligent buildings" are defined as follows: "Building where the latest technology is used." With this definition it is clear that they are called smart materials which can update building systems. Although innovation in intelligent buildings is very important but it does not mean that it necessarily makes intelligent building systems integration, data exchange and call.

The International Architecture Symposium in Toronto in 1985 stated that: "An intelligent building is a mixture of innovation (whether it is technological innovations or not) with perfect management in this context and with these two funds was spent to large returns. It may seem that these goals can only be considered in the construction of commercial buildings and office building houses but they do not care. Unless these goals in order to comfort people and the efficient use and operation of the whole capital to be considered. In addition to other purposes in the construction of commercial buildings and offices is concerned, is not mentioned in the above definition. Definition for intelligent buildings based on the definition of the essential goals EIBG (the creators of intelligent buildings in Europe) [1] clearly seen that says: "an intelligent building, a building performance efficiency and increase the tenants and the effective management of under certain circumstances and provide the lowest cost." Efficiency and effectiveness are somewhat untouchable and intangible. Just by looking at past performance and compare it with a new function, to some extent, these two concepts can be achieved. Also lower costs (efficiency and effectiveness) of objects that should be considered by the system controller.

On the other hand, in 1996, Bob has provided a definition for smart buildings. "Building taking advantage of modern technology to make it possible to automatically control components and equipment." This definition reflects the well-controlled data exchange between components, controls and components in the intelligent buildings. The headquarters building is listed in the definition DEGW in 1998. An intelligent building is responsive to the needs of their users and the ability to coordinate or new technology that can change its organizational structure, to coordinate. This definition covers a topic important to the process of building a command.

The word "responsible" in this definition means an "exit system" is. The word "the needs of users" represents a system's ability to recognize and identify the "needs" of inputs by the user. The word "harmony" indicates the ability to match the germ. This coordination will be done by the system itself or by others.

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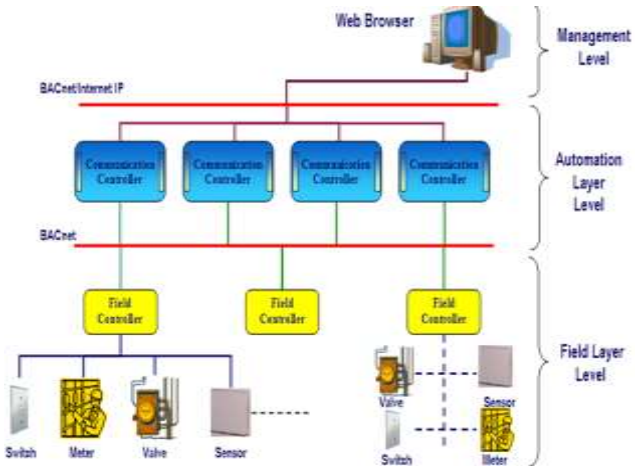
In 1988, architect called 'Atkin "definition for intelligent buildings offering. "Atkin" In addition to his definition of information (input) and response capacity (output), the time factor was involved. Based on this definition, all decisions in the face of events outside and inside the building systems should be adopted in it's if these decisions are made at a later date, will be invaluable. The word "knows" in the "Atkin" means information received (input) and communication tools through which information is collected and entered into the control system. The word "decide" in this definition represents all answer. As the temperature within the system to balance, harmonize building form, all entitled "Output System» (output) is.

Transformation that has occurred in the telecommunications and electronics will expand the capabilities of smart buildings. Ability to learn in an integrated system that includes the term "coordination" and is listed in DEGW definition, causes an experience similar system is used in other cases. According to the experiences and teachings to make the best decisions in addition to learning the system, the information must be exchanged between different parts of the (BCS), which is part of the control structure, which must be analyzed and processed in the brain as part of the BCS building.



With these qualities, the main features of the building have to be smart to read as follows.

1. Entry task information systems by means of the recipient are responsible. (Input)
2. Data processing and analysis
3. Outputs in the face of information received by the input of the system, after processing, to adopt the necessary measures. (Output)
4. Considerations when it comes to decisions that occur on time.
5. Ability to learn.

Definition of smart architecture should be worded so the above properties. In this article I'll discuss these features to make clear the role of each in the intelligent buildings.

Inputs

Each part of an intelligent building device that they have received and entered into the control system. A system of four different methods to obtain the desired information.

Sensors

When talking of smart architecture, the starting point should be the sensors.

Sensors are devices that collect information to internal and external structures. In the interior, the sensors provide the ability for the system to have an understanding of the conditions inside the building. In outer space, the data from the outer perimeter of the building at certain times to receive and collect.

The sensors are divided into three categories: sensors inside and outside the building are subsets of these three types. Solar radiation sensors, security sensors and surveillance sensors, noise sensors, such as external sensors are changing color and visual appearance. Sectors such as energy sensors, climate control, lighting unit, air conditioning types of sensors that are within the means they have accomplished several goals.

These three groups are as follows.

Security and surveillance sensors that are in the service area within the building.

A. Fire and smoke sensors

B. CCTV

C. Entry and exit sensors

D. Vibration and acceleration sensors

E motion sensors

Sensors to detect air quality

A. Temperature sensors

B. Humidity sensors

C. Solar radiation sensors

D. Air pressure sensors

E. Light sensors

F. Water flow and gas sensors

G. The sensor detects the air content

H. Sensors for humidity detection

I. Sensors of chemical

Surveillance sensor system

A. Sensors for structural system

B. Sensors for monitoring mechanical systems

C. Other sensors that monitor various components of the building.

Nerves as building sensors that can detect certain conditions and decisions regarding the required conditions take the endogenous and exogenous.

Archive information and return again

Any intelligent system must have the ability to archive information and refer to them. The word refers to the means, for example, the system must be certain scenarios in the Conference room schedule and if need be that this room is connected to the network and air conditioning system for the temperature of 75 degrees Fahrenheit at a certain time, the system should be able to see your past information and recall and conditions of supply. Archive information the role of memory in intelligent systems.

Manual planning

The system should be such that their users are able to schedule it. A user (an administrator, the user whom) should be able to at any time according to the terms of the new requirements, the new program on the system design.

The Internet

Connect the various parts of the system to the Internet makes it possible to introduce various components are up to date and the information provided by various computer companies on the Internet has been put. More computer systems and instrument rated files are updated and the companies provide these files over the Internet. So if a system wishes to have a better day and performance, is inevitably associated with the companies provide update files via the Internet, its control systems up to date.

It should be noted that all of the information collected from the Internet to the software for processing data delivered.

Data analysis and processing software

Information processing in the building control section is done (BCS. (BCS all systems as a system control unit, as well as the ability. also that each system separately. Control Center building is a place where all solutions for the unit at the place to be. "So an integrated building systems" (BSI) in various parts of the integrated building. To be, they should have specified other URLs to allow components based on other components it addresses values.

Outputs

The output of the BCS are the orders had based on decisions made by the system are exported. These decisions will shape the controller system responses and can at least make them divided into 2 categories: internal and external responses. Internal and external commands and replies related to the system controller. The internal responses that are kind of commands all measures adopted in connection with the building inside. The orders are calculated and planned within the system including the replies. Another example is the internal responses to the system, the ability of a smart structure in its structure that changes along this device can withstand wind pressure. Foreign responses that are based on the outcome of the internal responses information processing are given shape.

A foreign developer can have two forms: stationary or moving. Static external responses such as temperature changes, changes to the audio visual changes or changes of light. On the other hand the motor responses in the form of the move. When the system decides an opened or closed. This practice including the motor responses that architecture is accountable for its users. In the next section on architecture of motion and we will talk more accountable.

Responsive architecture

Responsive architecture is a type of architecture that has the ability to meet the needs of users. Why does that make this type of architecture of intelligent type? Unless you need some kind of clever responses needed to be processed. For example, a wall of Adobe in response to the warm air out the House, cold weather and cool in the Interior to provide introduces. This action is of course materials including the specification of processing apart from clever because the right Adobe walls based on information given from the outside of the building and processing it into a cool action space within the building. Therefore, this reaction is clever architecture into account.

Some explanations about the responsive show that type of architecture representing a certain type of accountability that is Verily the motor response. «Fox» in 2003 said: "nature is a responsive system is how the mechanical structures are put next to each other on the design interactions and have clever». But what happens falls if a system of accountable, his response is to be static? As in the case of temperature changes and color arise. «Stork» in 2003 to responsive architecture definition. "The kind of architecture that includes corrections and changes in the form is so constantly against the environmental conditions that have surrounded it, show the reaction." As we accept that the changes in the structure of the only kind answer. As a result the term responsive architecture is based on intelligent feature high definition it should be up to the particular kind of movement responses. And this motion must contain all of actions in the architecture.

So smart and responsive architecture includes all the basics and the result is that

architecture is the ability to provide clever answer to all the needs of the users and basing.

The type of accountability that "Fox" and "Stork" in its definition of responsive architecture, have been introduced (motor response) architecture accountable to a higher degree.

Smart architecture

The architecture of motion

Originates motion in moving to the art of architecture at the beginning of the 19th century, artists struggled to make sculpture that has animated members. The statue of the "happy-looking» the effect of Daniel Rosin, who in 1999 was made one of the sculptures is a movement in which electronic technology is used. The movement Arts in architecture as art works in the building, and sometimes also within the building are employed.

In the life of nomadic peoples, as well as the architecture of motion. Their tents are moveable structures that have the ability to retract and nomadic peoples can they carry. Motor structures as folding and portable structures in architecture of motion are visible. "Fox" in the year 2000 the architecture defined the movement as such: "mobile and variable position of the building with a variable geometry and motion." He describes a variety of motor systems found that one of them was the folding system. So the concept of architecture of motion is not a clever concept in principle but some sort of ability in mind makes that can control the structures and the various components to make it move.

Now we try to move against the concept of intelligence as a response that changes according to the structure, the introduction of. "Calatrava" sample offer to move into the building to work. According to the instructions of your motor in the Calatrava structure, we see that he is allowing his works to the structure. For example, the roof of the Milwaukee Museum this is the ability to move or change shape.

The next step with regard to the definition of "Oster hues" (2002) goes back. Which says: the building has a motor that is equipped to design sensors that stimulate your system to be able to receive the information in the form of the movement, the response said.

Architectural control mechanism in motion

To better understand the control mechanism to describe the various types of control (manual, traditional) and how to convert them to a variety of smart, we'll pay. The three main types of mechanisms to control the movement in architecture there are:

1. The inner mechanism
2. Basing the mechanism
3. Compound mechanism.

In the first type, the system is divided into small sections that this dividing system that gives the possibility to change the different parts. For this type of control system can be folded or folded as an example. The second type that is basing the mechanism, the ability of the system to move up. Whether this move is done by himself or by another force. For this type of control mechanism include retaining walls can be the example that they are somewhere in the installation or removal. And the head is a combination of the ink mechanism does inner mechanism and basing the ability to give your system the structure of Brown as well as all of your systems for all and move to perfection internal control mechanism, basing and composites. Mechanisms that are each instruments makes it possible to change

the structure. And of course, you can also control them manually. Manual control can also be smart. Other types of control are as follows:

Direct Control

In this type of control, motion and control from a direct source this is the source of the immediacy of output power, such as involve all electric motors and manpower. Move without shading overhead and moving partitions, animated example of this type of control.

Input Control

In this type of control, equipment for receiving information, about the need for move in this type of control, a result of the feedback information that entries received. Sensors and systems planning, examples of this equipment for example, sensors can be direct with your decisions that are in the system changes.

Control by multiple entries

Control and movement in this particular swear by multiple entries. Multiple sensors are examples of this are the entries that the information received from different sources, so that the best decisions to be adopted in relation to them.

Control by multiple sensors that cover all over the place

I swear this is one of the many stimulating and automatic sensors control is required. Move in this type of control is the result of an analysis of the input sensors with its system of annoy updated to the proper response would have been issued (quality output) in the name of total control of facades can be animated. And also the view according to the shape of the curve.

Intelligent control with multiple entries

In the name of the control, the ability to learn in your control mechanism, to be integrated in introduces. In this type of control system of experience using it to find the best solution.

Considerations when an invoice is essential which should begin direct control, in terms of. Due to the advanced technology and computer control and ability to make high-quality animated components, motor and intelligent design solutions, practical and effective.

Sensors in motor design

Move in this type of architecture can be as easy as opening a window or in or the complexity of moving a structure. Practical decisions one of the motor responses among BCS responses. For example, a system may be in order to get fresh air in a room have decided to filter the air in the room and or turn on the air conditioning, but the system must also be provided that the appropriate time to achieve the goal of getting fresh air in the room, the Windows open as well. The curved shape of the building can use sensors and stimulating with the action you want to create a moving hand. A Hyper-surface structure, made of "Dakoy" is a very good example for motor and curve-shaped architecture lacks the kind of architecture that is within the control. In this structural metal wall CNC folded with the impact of the environment on and around his replace shape deformation. This wall towards the movement, sound and light in a certain time, reacts. There is also a monument can use sensors of the existing conditions and potential problems to be aware of. Need more resistance against the wind with an increased internal tension through stimulating sensors, will be answered. For example, at the moment, "and the assumptions of physical and chemical studies on concrete by a micro-electro-

mechanical sensors. These sensors are embedded in concrete to Ph value, temperature and humidity, the concentration of chloride ions, sodium and potassium measurement. Some electronic companies as well, such as the Siemens company of these sensors to control their operation system.

Time considerations

As one of the features of a Smartphone, time, is one of the most important issues in intelligent systems. Because all actions and decisions must be in the prescribed time or a certain time vertex. For example, fire alarms shall be stipulated at the time of the warning system and the maintenance of the installations shall be stipulated at the time of this report the problem according to the due date on the spin of the light of the Sun to stay away. Sometimes the system on the detection and processing of the information given is wrong that this issue has led to the delay in the system. For example, it is possible that the smoke of the fire at first for the system to be treated as cigarette smoke. But after a short period of time and the system will be able to detect smoke that belongs to the fire. In this case, the system must have the ability to modify their sensitivity and their processing process to change in such a way that the next turn can identify smoke fire (ability to refer again to the learning and memory). This process can be summarized as the ability to learn as well.

Feature experience learning or learning ability

This feature is defined to include: batch of rules that follow them will increase the likelihood of problems. In review, it features some sort of ability that is using that system from the previous lesson experience teaches. Set the time the decision is an example of coding system with regard to past experience. Therefore, the adjustment is based on the new information given. The information given by the sensors or by individuals. In a conference room, the system can increase the number of individuals finds, so air temperature the room from 75 ° f to 65 ° reduce to heat to result from the accumulation of 20 people in a room is overcome. But after this operation that can be done automatically. The person who is responsible for the control of Task Manager detects that the temperature should be reduced from 65 to 58 and manually changes in the system. Therefore, during this process the system learns that his calculation of the reduction of the 10-degree temperature of the air is not so accurate. Therefore, in the next turn, and with the gathering of 30 people, the system works according to the previous experience, try the heat gained from each compute. This ability is very important in situations such as fires and maintenance facility.

Examples of the architecture of motion

Review and discussion on the existing buildings that have been built with smart motor aid is very enjoyable.

Rotary construction

The first example, the rotating building. The building of the outer shape of the curve as the controlling interest the building can use a motor, any form of the point of view of your plan. It also has the ability to take 360-degree spin. The building with direct control system works this way to spin this by using a button off and on is done. In fact, all the walls in the building can be moved from place to a different building can provide intuitive views. The building can be 100 times in one direction and the other 1000 times in

the direction of spin, while all its facilities to fully play their role.

If there are also sensors in this building?

There are sensors in this building that the owner of any gas seepage and interlaced or any object the fluid and psychologically informed. Every time that the homeowner will need to view the external can. Any problems in this building with direct control system solution. The degree of precision and intelligent system with working SQL sensors in order to get the information and interactions, incremented sensors can change the location of the bedroom to light from the Sun, heat, or light. On the other are the annoying sounds can also be removed as well as the surrounding landscape at any time and at any point of this House is visible. In such a holiday is needed up to 7 times over the last 24 hours control systems, mechanical, plumbing and electrical systems are checked. In addition, other systems should also be integrated and coordinated enough to any defects and shortcomings at the time of his report.

Dome has been changing forms

"Patrick Marcily" in 1986 to practice the idea of the rotating domes. And the first domed building as a model for others because "Albert Watson".

The building can be wood, concrete or steel construction and style. The building is 300 degrees rotates. Motor power 1 HP (475 watt) puts a disk drive to move. All the mechanical components that show the dome in the central part of the building have been used. Rotate the dome by means of direct control switch off and clear the controls. It also can be programmed in such a way the system so as to avoid the sunlight.

This is a typical building loyal to motor design this according to your input control device to change this building due to logical reasons, a highly integrated structure the manufacturer's reasons for turning by avoiding the Sun beams and heat the air. The flaw of this domain to rotate it returned. Because this building only the ability to rotate the 300 degree. In the system of rotation mechanism is planned. In such a way that the system has equipment that monitors the movement of the Sun and the heat of the Sun by this sensor receives and makes up the building to avoid the Sun spin. This can be due to the movement of the Sun sensor to decide whether the building will need to spin or not.

Building the tar

During the discussion about the architecture of motion must attempt the "Dayler" and "Scanido" we learn that tried to build that building from a variety of materials in it. The building called the "tar" renowned tent. They do this by using the metal materials on a Lake, which thousands of very tiny water droplets or spraying machine to take on the workforce so they spray. This boat-like structure even in the rain by a high-pressure spray technology in the mass of the air may like that minute to minute changes, is surrounded.

They are an example of the use of water in architecture offered according to their needs and their various forms to users. They have to water spray adjustment of computer use the amount and strength of the different climatic conditions in the spray of water on the field of temperature, humidity and wind speed and direction by the computer changes.

Results

So building a smart building has the ability to respond to the needs of its users (quality output) on the basis of the information processed by the multiple

inputs provide come. Accountability factor in the given time in this building is very important and essential. Multiple receiving equipment and send the information, with respect to the regulatory changes to the inner environment and are basing upon receipt. Also do not forget that one of the main components of a smart building, having the ability to learn. Prior to making an intelligent building system planning is very important to the targets that you want to give it a good. The real need to have a smart building can be carefully to the results to be revealed and that they need by making this building is removed or not for example, the productivity of one company's necessities the internal environment of an Office and a lot of factors to determine the productivity of an employee. As a simple example, I cannot in my Office over 3 hours of continuous work. Because the temperature of the air in the Office down. So whenever I have a cold feel of the Office and go to the open space and about 10 minutes from the heat of the Sun and then go back to the Office. Responsible for the facilities decided that almost every day a technician in the calls to check the room and increase the temperature. Idle time at work due to a bug in the air-conditioned air that makes the amount of reduced productivity that this is meant to be a pity and a company's resources.

Purposes which obtained by making a smart building POPs almost all aspects of human life. Efficiency, high efficiency, saving energy, entertainment, Farah and happiness, comfort, lower cost of living and increase the life of the building, and all are all examples of this type of goals is that by making smart buildings to come.

An intelligent building must have a system of nerves that includes sensors embedded in stimulating and that the information in the right time and proper control. With accordingly, can be for stationary or moving. So the change or lack of change in the internal structure or basing upon the examples of the ability of a smart building. According to the nervous system the task of integrating all systems is responsible for building a smart form have to be flexible in the face of changes to the environment in which it is located, the right action. As a man, according to the users should be able to figure out that it is happy or sad, or wannabe. On the other we must also be based on the ability to understand its users will have to act in accordance with their being.

In accordance with the definitions of various terms used, it is obvious that architecture is responsive in all the spaces and also an effective role to play in building architecture. The architecture of the building space and both must have the features that meet the needs of users. The architecture should not be held accountable for one or two types of reactions are limited but should all actions including static action, motion, and basing. In addition, in the architecture of the responsive, intelligent design is also required because the response is the result of clever processing.

Architecture is not a smart move unless you move the result to be clever if not processing a shelter tent is moving that functionality up and carry off. A new intelligent design should be all kinds of actions that each play a role, act as well.

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