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STUDY OF SMART BUILDING & ITS MATERIAL & IT'S CONSTRUCTIONS

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ABSTRACT

Technological advances and the idea of introducing technological solutions in the buildings have provided free and safe places to live and work. The term "intelligent building" is still widespread to establish a reputation and improve its status. However, it is said that too many buildings are intelligent and fluctuating variations but, without an adequate understanding of the intelligent building and the ability to evaluate the smart building, it is impossible to judge such statements. Since the beautiful Smart buildings offer a beautiful and comfortable place, many experts and researchers have examined the characteristics of Smart buildings and offered different explanations and methods. Completely agree. Good buildings are different from traditional buildings in their ability to cope with internal and external conditions and to provide construction activities related to safety, comfort and electricity. The ability to look at and manage different building techniques makes the building wise. The interaction between different types of construction is also important because of the complexity of the buildings. The goal of the study was to inspect smart devices in smart homes and provide feedback on staff utilization and staff utilization to determine Smart claims. Natural needs or not.

Following a literature review, two buildings were selected as examples of intelligence and a safe and secure space for guests to identify key intelligence features. The case study focused on intelligent building principles and specific design aspects, as well as system integration and efficiency. It was concluded that although the case study was fascinated by the application of commercial value and new technologies, these technologies were not used or included in the desired response and dynamism. which are the main attributes of intelligent buildings..

1. INTRODUCTION

Smart building is an excellent network, as well as an important part of energy consumption and stability. Land management systems such as HVAC management, lighting management, power management and measurement plays a very important role in determining the efficient energy efficiency of a building. The sensitive electric grid depends on the intelligent building. Motivational power behind good political economy, energy and technology Smart buildings benefit from the technology of data technology and existing and emerging technologies. For developers and homeowners, smart buildings increase the value of an asset. For buildings and convenience managers, good buildings simplify easy subsystems and financial management options such as system management. It advises architects, engineers and building contractors to combine beauty and skill with economy and expertise in project management and project planning.
All manufacturing technology systems are a network of end-to-end devices that communicate with management devices or servers for monitoring, management or service of high-device devices.
The ownership of the network device is through wire or radio transceiver. Networks are usually computer or computer management systems that manage and report.
On many systems, databases measure squares connected to the network, such as security identification and discussion programs. Identify this common network point.

1.2 Smart Building in Smart City Dimensions

In the recent days the definition of smart city has become very popular. These expressions recognize a populated area because it can deal with problems and desires in an innovative way due to the widespread use of comprehensive and extensive technology.
There are a number of ways in which cities are good, integrated, economics, government, environment, innovative services for trends, analysis, management, and management of city and management. A smart city is ready to collect and publish information related to each traditional social and economic life, and therefore, related to emergency, depth and continuous management. The advantages of energy saving, environment and the impact of thousands of people and the withdrawal of the presence of world production and activities should be taken advantage of, which in many ways produces energy and waste. Through the employment of technology, quality of life, life, expectation, prosperity, social and economic development, social life and nerve centers are scanned in just one good city for improving all living conditions (Bugatta, 2012).
Among these many good practices, creating a more intelligent and intelligent building, which is the result of the new definition of intelligence by the number of Buddhists. In conclusion, electricity resources do not appear to be inexperienced and as a result of the general tendency of the cleaner, a lot has been done, which is intended to be used as energy-efficient energy. Within the Building Sector, it has been completed in various types of Building Energy Management System (BMSS). Generally, BMS refers to a computerized system that tries to control all the forces of

intensive activities during a building. It can cure and ventilation, lighting, indoor climate and others ventilation. Sophisticated amount calculation This operation is not controlled separately. In this period, it is expected that good relationships should be kept in mind among the various parameters, among which the best operation (Nicolo, Calcoqua and Stavakakis, 2002, P12).

2. AIM AND OBJECTIVES OF THE STUDY

- To study about the smart building and its construction process.
- To study about the risk during the project.
- To know about the smart building material.

3. SMART HOME TECHNOLOGIES

3.1 The Smart Home building

A smart one-floor wooden house (hereafter smart Home; technical alias: MSWC building; floor area: twelve.1 m × 8.2 m; (Figure 1), that was designed at the FCE (i.e. school of applied science, VSB-Technical University of Ostrava) site as a coaching centre of the Moravian-Silesian Wood Cluster (MSWC), contains automated technologies for machine-driven management of operational and technical functions (such as HVAC, heating sources, and regulation, etc.) [5].

(Figure 1)

3.2. Features of used technologies

Technologies utilized in the MSWC building are divided into 2 main classes (Figure 2), thus: Building Heating Technology (BHT) , boiler, ventilation, air conditioning., Building Automation Technology (BAT) - BACnet with the choice of the following technologies: implementing smart systems.

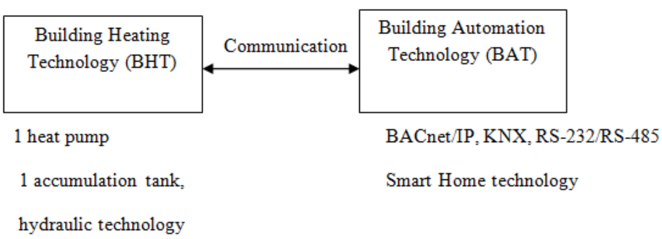

Figure 2.MSWC building — block scheme of the technological parts

3.3 Building Heating Technology (BHT

The MSWC building is supplied with a BOD as well as a groundwater apparatus, floor heating, boiler, ventilation, and air conditioning system. 2-U BHE, Joint Implementation of HST (Heat Storage Technology), BHT and BAT so as to analyze the potential for heat accumulation in the encompassing rock geological formation.

3.4 Building Automation Technology (BAT)

The control system, set in the MSWC building (Figure 1), consists of an automation sub-station of DESIGO px PXC100-E.D series (by SIEMENS) employing a BACnet communication protocol for information exchange between its own parts. The transfer medium is used by DESIGO is Ethernet / IP. OPC, the local area network, and M-Bus (Figure 3). The state of control and monitoring is monitored by employing the PXM 20E control board (Figure 3). All parts of this system - used for the regulation of heating and cooling sources and all the securing, management and auxiliary This plug-in board contains communication modules, specifically: temperatures (HST, BHT, BAT); relative humidity and carbon dioxide concentrations (BAT); pressures (HST, BHT); heat consumptions (BHT); electricity consumptions (BHT). PXC100-E.D automation station is used in the MSWC building to regulate and regulate ventilation, heating and air-conditioning (Figure 3). additionally to programmable management and regulation functions, this substation includes integrated functions of questionable higher management (such as alarm management, time programs, storage of measured knowledge, remote access, access protection for the whole network, user profiles and classes, etc. .). The entire technology is envisioned employing a DESIGO Insight software package tool, which is standard, object-oriented and clearly designed software package for this management station. The visualization application is split into a basic set and a few extension modules in accordance with desires of a precise technology (Vanus et al.,013).

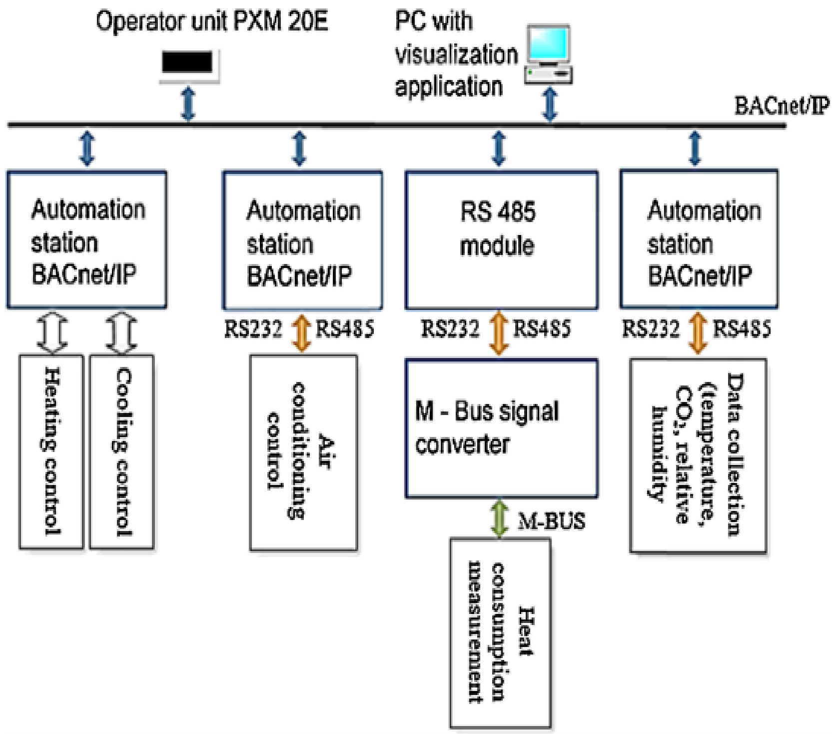

Figure 3.MSWC building — block scheme of the BAT part

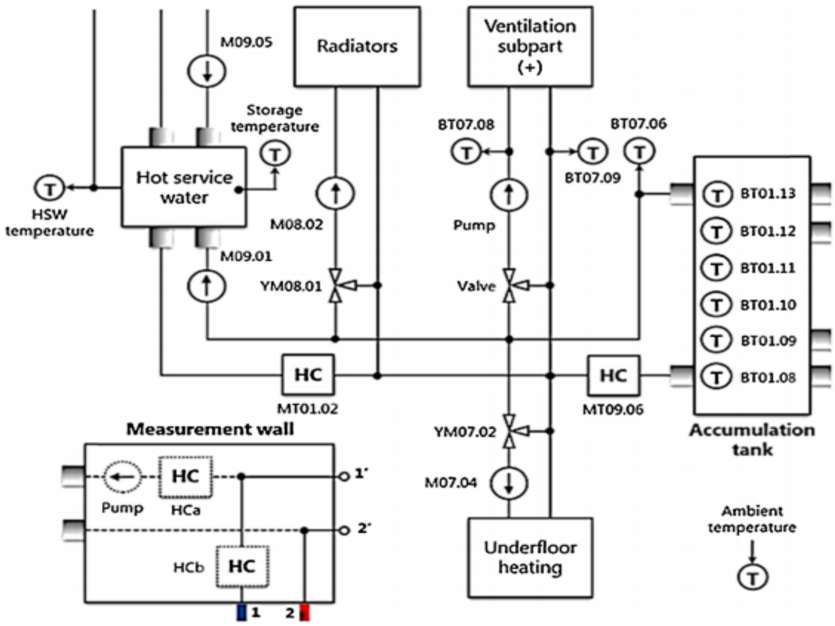

Figure 4.MSWC building — block scheme of the BHT part and the HST part.

3.5 BENEFITS OF SMART MATERIALS

Smart materials and production processes
• Superior strength, toughness, and plasticity
• Enhanced durability / service life
• Increased resistance to abrasion, corrosion, chemicals, and fatigue
• Initial and life-cycle value efficiencies
• Improved response in extreme events like natural disasters and fire
• Ease of manufacture and application or installation
• Aesthetics and environmental compatibility
• Ability for self-diagnosis, self healing, and structural management.

4. SMART BUILDING PARTS

4.1. WALLS

Wood trusses using metal connector plates have an extended history of reliable roof and floor performance within the construction industry. Currently over fifty years of truss engineering. Smart Components 'cutting-edge, tied frames and wall panels [55].

4.1.1. The role of Masonry Walls

External and Internal Masonry walls function components that defend the building. Fill – up Masonry walls do not bear any various the building.

3D Panel (double wire mesh with an intermediate building material - extruded polystyrene)

Figure 5Masonry walls

4.2.ROOFS

Roof is constructed after the phase of plaster.

The selection of type roof depends on:

- the building conditions
- the preference of the owner
- the climate

4.2.1 Type of Roofs

- Roof with tiles fastened with on the slab
- Roof with fixed tiles
- Roof made of timber
- Roof with visible timber

Smart roof solution consists of,
- Load-bearing sheet roof structure design with sensor points.

- Structural design is done with Ruukki's assistance and by using Ruukki's dedicated Poimu software for the structural design of load-bearing sheets. The software includes smart roof censor point calculation.
- On-time delivery of load-bearing sheets
- On time delivery and installation of technical devices: strain gauge measuring devices, wireless transmitters and gateways.
- Ruukki installs the technical equipment based on structural designer's blueprints.
- Test use of technical devices and online monitoring service
- Ruukki tests to ensure that data is visible from the sensors.

4.2.2 Technical devices

- The smart roof is designed to work in dry conditions (C1 & C2 corrosion classed). Ruukki's load-bearing sheets [57].
- Technical devices included in the solution:
- • Basic set of monitoring equipment includes three sensor devices and one gateway. This basic set is covers up to 5000 of roof area.
- • For larger than 5000 roof areas, one extra sensor device is required for every 2000.
- • Strain gauge measuring devices are glued to the load-bearing sheet and have a connection to the smart roof wireless transmitter.
- • Wireless transmitter includes a strain gauge data amplifier, radio frequency sender unit and integrated humidity and temperature sensors. The strain gauge measures the snow load four times per day extending the battery life time up to five years.
- The wireless transmitter sends the data to smart roof gateway device, which needs to be plugged into main current.
- The gateway device sends the data using a GPRS connection to the web service supplier's server for online monitoring.

Figure 4.2.Roof models of smart buildings

4.3. FOUNDATION (FOR EARTHQUAKES)

Damage is expected during major ground shaking. However, even in severe earthquake shaking, buildings should not collapse, threatening the life safety of the occupants. It is usually not economically viable. However, the provision of seismic measures during construction is critical for limiting the extent of damage and prevention collapse [58]. This chapter provides important considerations to be taken into account before and during the construction of a new stone masonry house.

4.3.1Stages of Foundation

1. Application of Gross beton.
2. Marking the border lines of foundation – Shuttering.
3. Placement of steel reinforcing.
4. Earth wiring.
5. Installment of metal anchor bolts for fastening the metal columns to the foundation.

6. Application of Concrete Foundation

Recommendations related to foundation construction are outlined below.

4.3.2 Foundation depth

The minimum depth of foundation is 600 mm recommended for a standing soil. This is the area where the building is located. illustrations in Figure 6.

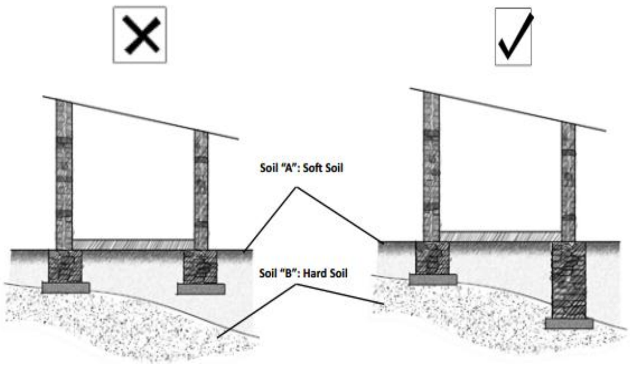

Figure 6.Different foundation depths are required for building sites with variable soil properties (source: GOM 1998)

It is desirable to avoid the use of mud mortar in the construction of stone masonry foundations. If mud mortar is used, it is advisable to provide an RC plinth band to avoid uneven building settlement and tie building elements together at the plinth level. If a timber plinth band is used, it should be installed 300 mm above ground (see Figure 7).

4.3.3 Foundation depth

Foundation width

A 750 mm wide continuous strip footing is recommended for 450 mm thick stone. When the wall thickness is less than 450 mm, the footing width may be reduced, but should not be less than 600 mm. 750 mm foundation width. Local practices should be followed in deciding.

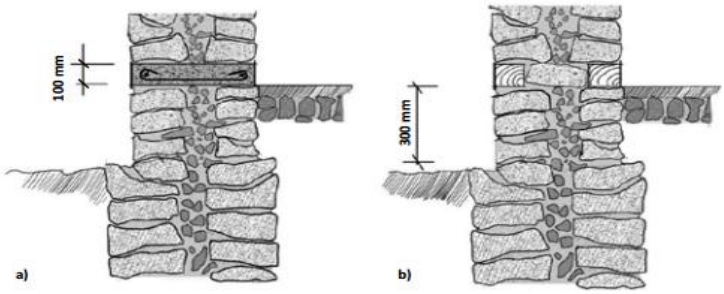

Figure 7.Stone masonry foundation with plinth bands: a) RC band, and b) timber band

This analysis is particularly targeting the smart building structures and its parts. And therefore the} risk factors in constructing smart buildings were also discussed. The factors to beat these risks were determined here. Given the challenges posed by the increasing adoption of smart buildings. In a spatial context. The work represented during this thesis. It remains to extend the analysis of this work with larger sensible testing and reinforcements and deployment. Smart buildings are progressively valuable and therefore the overall organization. Good buildings improve the efficiency of individuals and processes. Integration is enabling facility executives to reap smart-building advantages, both in new construction and conjointly.

After reviewing this state of the market and academics researches in the "smart" buildings field, it was absolutely observed that the definition of a wise building is extremely obscure and a building "intelligence" is commonly confused with a building automation. However, potential advantages of "smart" buildings are abundant wider. The Intelligence Quotient (Intelligence) will exist. Because of probabilistic nature of machine learning algorithms and complexity of a system, it is not possible to induce an input for BIQ formula analytically. So, a development of a purposeful model of building processes (environmental changes and inhabitants activities) is needed to translate this concept into life.

5. CONCLUSION

This analysis is specifically designed in a smart building. The reason for this risk is set here. Considering the challenges that arise due to the rise of smart buildings. The work presented during this thesis. It extends the analysis of this work with more intelligent testing and makes this trend stronger and established in real world concepts. Smart Building is a feature editor and therefore valuable to the overall organization. Good buildings help to improve the efficiency of people and processes and help in better selection of the organization. To implement step-by-step steps, integration has been enabled by the authorities.

After reviewing the situation of "smart" buildings and academic research, it is fully understood. However, "smart" buildings have been expanded quite a lot. On the appropriate theoretical basis (intelligence quote creation) which separates these two concepts and can be used to evaluate "intelligence" buildings. Due to the possible nature of the machine learning algorithm and the complexity of a building. Therefore, to develop this concept of life, the development of intelligent models of the construction process (the environmental change and activities of the residents) is needed.

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