Basic Concepts of the Smart Home System

Jurayev Vohid Tojimamatovich
PhD in Pedagogical Sciences Fergana State University

Xalilova Muhabbat Alimdjanovna
1-year master's degree Fergana State University

ANNOTATION

The course introduces you to the basics and principles of developing «a smart home system consisting of dozens and hundreds of I/O modules. They collect data from the sensors of each system, perform primary processing of information and transmit it to the central processor комплекса of the home automation complex, which analyzes the collected data and acts in accordance with the program stored in its memory.

KEYWORDS: Smart home, smart buildings, comfort, security, economy, sensors.

In modern smart buildings системы , automation and building management systems occupy a key place, ensuring the interconnection of all engineering equipment and building systems.

По According to the MiDart agency , in "smart buildings" operating costs are reduced by30%, payments for electricity are also reduced by 30%, for water-by 41%, for heat-by 50%, and insurance risks are reduced by 60%. Obviously, что this is an opportunity to achieve not only the highest degree of comfort and safety of a person living in the city "Smart Home", but also saving natural resources and costs.

To the advantages "Smart Home" primarily includes:

1. Comfort– this means that this technology is aimed at freeing the residents of the house from daily "communication" with various системами engineering communication systems. Basically , she сама controls various devices herself, taking into account the features of each of them. If human interference is necessary, the computer program will report it. And then, in most cases, such intervention is limited to pressing a few buttons on a special control panel.

2. Safety. Modern housing today is almost always equipped системами with fire safety systems, security alarms, technical alarms and video surveillance. And эти all these systems are integrated into the management technology "Smart Home";

3. Savings- "Smart Home " allows you to reduce the cost of electric and thermal energy by regulating lighting and climate in rooms that are not used at a particular time.

A special place is occupied система by the security system зданий of class "buildingsSmart Home". An integrated security system will significantly reduce and sometimes eliminate the possibility of dangerous situations at any object:

in an apartment, cottage, office, business center, shopping and entertainment center Module Reference: «Smart home in the center, store, warehouse, hotel, museum, theater, industrial enterprise and other objects of any degree of complexity.

Fires, malfunctions in системах подачи water supply systems and imperfect security systems cause serious material losses.

At the same time, the economic growth of recent years leads from an excess of electricity in the past to its shortage in the future, which, in turn, creates prerequisites for a wider introduction of energy-saving technologies and алгоритмов control algorithms, which, в first of all, are provided by building automation systems.

Using this system in Europe, The United States and many Asian countries have long been the standard for equipping new buildings, and the typical capabilities of such systems are laid down in almost every project.

Popularity is the same "Smart Home " in Russia is still small. The main reasons are:

➢ incorrect perception самого of the concept itself "Smart Home", as well as negative attitude to this topic caused by poor -quality work of some installation companies at the stage of formation of the Russian market of home automation systems;

➢ the lack of experience of installation companies contributed to the fact that представители company representatives often made obviously impossible promises, and as a result , the implemented systems were very different from the customer's expectations.

➢ perception of the concept "Smart home " is very narrow– as a set of presence or motion sensors, with the help of which the light will light up and go out automatically or on a clap.

➢ poor quality of the supplied electrical energy.

Basic concepts "Smart Home"

Regardless of the application area, whether it is a building, an assembly shop or поезд a subway train, the goal of implementing such systems is to reduce operating costs, provide important information, and increase safety and comfort.

In order to understand how much automation capabilities have changed in recent years and how they ещё will continue to change, it is important to understand the significance of some of the technological breakthroughs that have occurred in recent years.

Today , apartments and cottages are a complex complex of engineering systems and all kinds of equipment that requires qualified operation. But it is not necessary to hire specialists from service organizations, в these days the management of housing can be completely entrusted to smart devices. «Smart Home " will remove from its inhabitants the concerns of security, energy supply management, heating, ventilation and air conditioning. Thanks to modern technical solutions, each system works in accordance with external conditions, in an optimal mode, saving time and money. Such housing is spared from uninvited guests, negative consequences of accidents, irrational waste of energy resources, and the owner learns about any incident through remote notification.

American writer Ray Bradbury ещё described the во concept in detail back in 1950 концепцию"Smart home" in your story "There will be a gentle rain", and today the ideas of a science fiction writer have become a reality.

The most famous smart housing was and still is the Bill Gates villa, where at the entrance

each guest receives a special electronic identifier in the form of a badge that provides connection to all information services of the building. Sensors use it to determine the user's location . A person moving around the house is accompanied by their chosen им video programs and music, and in the evening and at night-a light wave formed by automatically turning on and off lamps.

Тенденции Western trends are gradually embracing и our country as well. But so far , intelligent управления building management systems are not very common, so many владельцы property owners даже do not even know what opportunities the current level of development of this technology provides.

Under "Smart home " should be understood as housing that is automated for the convenience and comfort of people using high-tech devices. Such a system is able to recognize specific situations occurring in the room, and automatically respond to them, and all the controls are connected to each с other and work in a single complex. Residents of an intelligent home do not need to use dozens of switches or remote controls to control lighting, ventilation , and air conditioning. It is enough один раз to select a scenario once, в according to which будет построена работа the entire equipment will work. Housing will respond to the time of day, weather, position of the person in the room, lighting, temperature, thereby providing comfort for the whole family.

One of the most popular ways to implement the smart building concept is using KNX (deploy) technology. The essence of its operation is в том, that подключённые к сети the subscribers (devices)connected to the network they can exchange information via a common information bus. At the moment , KNX is an open global standard that is supported by more than 300 manufacturers around the world. This technology represents a logical development of requirements for инженерным системам building engineering systems. On its basis была , an intelligent installation system ABB i-bus KNX was created, an important feature of which is the complete interconnection of all elements included in this product line. In practice, this means that you can make changes and expand the system without revising the overall plan or re-posting the transaction. Thus, it is possible to modify the smart network years later.

In order того to turn an ordinary home into an intelligent one, in accordance with KNX technology, the following elements will be required:

➢ Sensors (sensors and элементы controls) – wall panels and switches, sensors of physical quantities(temperature, humidity , etc.), thermoregulators, motion and presence sensors, timers. They are responsible for registering certain external events, the occurrence of which should cause определённую a certain response of the system. For example, the sensor detects an increase in temperature and sends a control command over the network to turn on the air conditioner.

➢ Исполнительные Actuators (activators) – регуляторы lighting regulators (dimmers), relay modules, louver controls, heating radiators , etc. They change their state(on/off, open/closed) in accordance with the commands received from the sensors, thereby controlling various electrical equipment;

➢ System devices– power supplies, controllers, interface and logic modules, bus connections , etc. They are installed in a separate electrical cabinet and provide the ability

to build and operate the KNX network as a whole.

Advantages of the system "Smart Home"

One of the main advantages of the system "Smart Home " is a centralized management of all engineering systems. As a"remote control " for the house, a keyboard panel can act, resembling a switch in appearance. Each key is responsible for controlling any device, equipment (or a whole group) either activates a sequence of necessary actions. There are developments (for example, управления the Busch-PriOn control panel) that дополнительно can additionally be equipped with a 3.5 " TFT display and a rotary элементом control element. The first one displays all the current information about running programs running in the house, and by turning the controller, you can easily select the necessary functions from the menu. You can use it to configure different systems–lighting, blinds, climate control, multimedia. The user interface of the menu is very simple and understandable even for a child, in addition, each functional section has its own color, which carries a semantic load. Yellow– light control; orange-temperature control; blue-blinds mode; magenta– for other scenarios, such as turning on music.

Control panels become an integral part of the interior, and sometimes a key element that brings в обстановку the spirit of high technology to the environment. Often preferences are given to products with a concise design, made in a "classic" color-black or white, but without a module: «Smart home " sometimes the client wants to see unusual color solutions, while different for each room. It should be noted that the palettes of modern manufacturers help to realize even the most unexpected wishes. For example, choose a device made of materials that mimic glass or precious stones.

Keyboard elements are selected based on the tasks that будет выполнять the system will perform "Smart Home". Домашнюю автоматику You can build your home automation system in a component– by-component way: select only the functions that you really need. For example, combine air conditioning and heating, or combine lighting and raising / lowering blinds. Accordingly, in the first case , you can put a thermostat and a one-key element, при with which you can send a signal to the heating or cooling device. And in the second– a light sensor and at least two keys for control, one "responsible" for artificial lighting, and the second– for natural.

It is advisable to include in the system "Smart Home те devices are those that most often всего have to be controlled: светильники, lighting fixtures, climate control devices, multimedia equipment, etc.

Literature:

1. Abobakirova, O. (2020). INTERPRETATION OF THE PERIOD AND HEROES IN UZBEK CHILDREN'S STORIES. *Theoretical & Applied Science*, (5), 821-825.

2. Adkhamjanovna, K. M. ., Mirzakholmatovna, K. Z. ., Raxmonberdiyevna, T. S. ., & kizi, M. M. B. . (2022). Increasing Interest in the Lesson through Extracurricular Activities. *Spanish Journal of Innovation and Integrity*, *6*, 256-261.

3. Alijon, A. ., Xoldorovich, S. Z. ., Abbosovna, G. M. ., & kizi, M. M. A. . (2022). Technology of Individualization of Learning. *Spanish Journal of Innovation and Integrity*, *6*, 291-297.

4. Anvarjonovna, A. O. (2021). Factors for the Development of Ecoesthetic Culture of Future Preschool Educational Professionals. *European Journal of Humanities and Educational Advancements*, *2*(5), 162-164.

5. Ashurova, O. (2021). Analysis of foreign experience on the development of eco-aesthetic culture of future preschool education specialists. Asian Journal of Multidimensional Research, 10(10), 1478-1484.

6. Ashurova, O. (2021, December). THE IMPORTANCE OF AESTHETICITY OF ECOLOGICAL CONSCIOUSNESS AND CULTURE IN THE ACTIVITIES OF PRESCHOOL EDUCATIONAL PROFESSIONALS. In International Scientific and Current Research Conferences (pp. 88-90).

7. Ashurova, O. A. (2021). AESTHETIC EDUCATION AS A FACTOR OF PROFESSIONAL TRAINING OF PRESCHOOL TEACHERS IN A PEDAGOGICAL UNIVERSITY. Theoretical & Applied Science, (5), 425-427.

8. Ashurova, O. A. (2021). SOCIO-HISTORICAL TRADITIONS OF DEVELOPMENT OF ECOESTHETIC CULTURE OF PRESCHOOL EDUCATIONAL PROFESSIONALS. CURRENT RESEARCH JOURNAL OF PEDAGOGICS, 2(05), 46-52.

9. Dadakhon, T. ., & qizi, D. A. A. . (2022). Factors that Review Students 'Imagination in the Educational Process. *Spanish Journal of Innovation and Integrity*, *5*, 551-557.

10. Dadakhon, T. ., & Sabohat, A. . (2022). Developing Creative Thinking through Primary School Students Solving Problems. *European Multidisciplinary Journal of Modern Science*, *6*, 71–76.

11. Farkhodovich, T. D. ., kizi, D. M. S. ., & kizi, A. U. Y. . (2022). Critical Thinking in Assessing Students. *Spanish Journal of Innovation and Integrity*, *6*, 267-271.

12. Han-Woo, C., Khan, V. S., Yilmaz, E., Omelicheva, M., Hyo-Joung, K., Chai-Mun, L., & Chung-Rok, P. (1999). *International Journal of Central Asian Studies*. Institute of Asian culture and development.

13. INTER, FIBER LENGTH IN. "An International Multidisciplinary Research Journal." *An International Multidisciplinary Research Journal* 41.43 (2017).

14. Jo'rayev, V. T. (2019). The advantage of distance learning courses in the process of education. *Scientific Bulletin of Namangan State University*, *1*(9), 220-224.

15. Jo'rayev, V. T. (2020). The Role And Advantages Of Distance Courses In The Innovative Educational System. *The American Journal of Social Science and Education Innovations*, *2*(10), 434-439.

16. Jurayev, V. T. (2020). PEDAGOGICAL SOFTWARE IN THE PREPARATION OF FUTURE TEACHERS OF INFORMATICS IN AN INNOVATIVE ENVIRONMENT. *Theoretical & Applied Science*, (4), 182-185.

17. kizi, O. N. K. ., kizi, B. M. U. ., kizi, S. Z. M. ., & kizi, K. G. T. . (2022). Education Creation Training Multimedia – Means. *Spanish Journal of Innovation and Integrity*, *6*, 249-255.

18. Kochkorbaevna, K. B. ., Pulatovna, N. G. ., & Nurmahamatovna, O. Z. . (2022). It in Individual Learning. *Spanish Journal of Innovation and Integrity*, *6*, 284-290.

19. Maxamadalievna, Y. D. (2022). USE OF PRESIDENTIAL NAMES IN UZBEK CHILDREN'S TEXTS. *Gospodarka i Innowacje.*, *22*, 68-70.

20. Maxamadalievna, Y. D., & Matmusaeva, M. (2021). On Lingvofolcloristic Units. *International Journal of Culture and Modernity*, *11*, 169-171.

21. Maxamadaliyevna, Y. D. ., & kizi, A. O. M. . (2022). FORMATION OF COGNITIVE COMPETENCE OF A PRESCHOOL CHILD. *Modern Journal of Social Sciences and Humanities*, *4*, 53–57.

22. Maxamadaliyevna, Y. D., & O'ljayevna, O. R. F. (2020). Tursunova Dilnavoz To 'lqin qizi, Sharofutdinova Ra'noxon Shavkatovna, Ashurova Oygul Anvarovna. Pedagogical features of mental development of preschool children. *Solid State Technology*, *63*(6).

23. Maxamadaliyevna, Y. D., Òljayevna, Ò. F., Qizi, T. D. T., Shavkatovna, S. R. N., & Anvarovna, A. O. (2020). Pedagogical Features Of Mental Development Of Preschool Children. *Solid State Technology*, *63*(6), 14221-14225.

24. Muhammadkadirovna, G. D. ., Abdulhamitovna, S. H. ., & Qizi, R. D. T. . (2022). The Role of Innovative Training Methods in Individualization Training. *Spanish Journal of Innovation and Integrity*, *6*, 272-279.

25. Mukhtoraliyevna, Z. S. ., & Salimakhon, M. . (2022). Psycholinguistics and Neurolinguistics of Bilinguism. *Spanish Journal of Innovation and Integrity*, *6*, 387-391.

26. Mukhtoraliyevna, Z. S. ., & Saminjanovna, M. S. . (2022). Formation of Future Primary School Teachers Skills to Use Project Activities. *Spanish Journal of Innovation and Integrity*, *6*, 346-353.

27. Mukhtoraliyevna, Z. S. ., & Tavakkalovna, A. G. . (2022). History of Information Technologies in Education. *Spanish Journal of Innovation and Integrity*, *6*, 359-363.

28. Mukhtoraliyevna, Z. S., & G'aniyevna, M. M. (2022). Oral and Written Forms of Speech. *International Journal of Culture and Modernity*, *13*, 39-43.

29. Mukhtoraliyevna, Z. S., & Madaminkhonqizi, S. M. (2022). Methods of Mnemonics in Pedagogical Work with Elementary School Students. *International Journal of Culture and Modernity*, *13*, 44-52.

30. Muxtoraliyevna, Z. S. ., & qizi, M. M. M. . (2022). The Concept of a Poetic Text and its Features. *Spanish Journal of Innovation and Integrity*, *6*, 418-423.

31. Sobirjonovich, S. I. (2021). Didactic Interaction as Whole Integral Education. *International Journal of Discoveries and Innovations in Applied Sciences*, *1*(7), 80-83.

32. Sobirjonovich, S. I. (2021). Professionalism as a Factor in the Development of the Pedagogical Activity of the Future Teacher. *Journal of Ethics and Diversity in International Communication*, *1*(7), 76-81.

33. Sobirjonovich, S. I. (2021). Professionalism as a Factor in the Development of the Pedagogical Activity of the Future Teacher. *Journal of Ethics and Diversity in International Communication*, *1*(7), 76-81.

34. Sobirjonovich, S. I. (2021). Speech Education for Children from 1 To 3 Years of Age. *International Journal of Innovative Analyses and Emerging Technology*, *1*(7), 135-141.

35. Sobirjonovich, S. I. (2021). Teaching Preschool Children in a Second Language. *International Journal of Culture and Modernity*, *11*, 406-411.

36. Sobirovna, U. O. . (2022). The Use of Mnemotechniques in Teaching Younger Schoolchildren. *Spanish Journal of Innovation and Integrity*, *6*, 446-450.

37. Valijonovna, K. I. ., Rakhmatjonovich, T. D. ., Mukhtoraliyevna, Z. S. ., & kizi, S. G. G. . (2022). Informational Technology at Education. *Spanish Journal of Innovation and Integrity*, *6*, 262-266.

38. Xolmatova, Z. T. Teoreticheskie osnovi gendernogo podxoda v pedagogike. *Nauchniy jurnal «Gumanitarniy traktat» www. gumtraktat. ru ISSN*, 2500-115915.

39. Абобакирова, О. (2014). Особенности развития речи у дошкольников. *Актуальные проблемы гуманитарных и естественных наук*, (6-2).

40. Абобакирова, О. (2015). Современные проблемы и инновационные подходы подготовки детей к школе. *Молодой ученый*, (3), 891-893.