Modern way of living: Smart City Management

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Abstract.

Homes being smart is referred to gadgets that provide binary connections, automation or intensified assistance to occupants of buildings. Recently technology is being so forwarded that smart home management has become a burning topic everywhere with different policies of energy efficiency management, sustainability of the building and even climate change. The smart home is playing a central role in building a smart city. Is the planning of a smart home actually encouraging goals of sustainability? What are the risks, benefits and agendas to follow up for the smart city development? A study of recent research paper on smart city development and smart home management revealed implement of smart material manufacturing technology into a smart building, finally developing a smart city. It is found that a high-speed internet connection plays a crucial role in managing a smart city system, smart homes being its smallest management unit. Some technologies have been adopted from the European Culture of smart home cities. Moreover, things can be made smarter by pairing smart home voice assistant to our broadband provider (Wi-Fi) e.g., Amazon Alexa, Google Echo.

Keywords. Binary, automation, sustainability, smart city, internet.

1. INTRODUCTION

Digitalization is the key to unlocking solutions and opportunities to everything. According to projections, “nearly 65-70% of the world’s population will live in urban areas by 2050, while many megacities are struggling to handle the alarming increase of inflow of people” [1]. It is essential to idealize metropolises and megacities and primarily “to create smart cities in order to make urban areas more livable and truly sustainable [2]. An eco-city or sustainable city, the smart cities aim to improve the quality of urban services or reduce its costs”. Cities can also be made more sustainable by turning their homes into batteries [3].

1.1 Smart manufacturing

Intelligent manufacturing refers to the process of monitoring the production process by machinery connected to the internet. Smart manufacturing of each building block and other units for different kinds of utilities contributes to the conception of a Smart city [4].

1.2 Smart building materials

Each building materials type such as bricks, cement, sand and their types, is to be manufactured using internet-connected machines [5].

1.3 Smart Construction

The use of machines from small scale to large scale controlled via the internet should be encouraged for construction purposes. This would reduce the need for a large number of labours at the construction sites, as well as accelerate the building process [6].

1.4 Smart Home

The use of smart devices such as Alexa and Google Home in private homes would improve the way of living using smart voice assistants. When these devices are connected throughout the building and all its appliances are running, a lot of electricity and energy can be consumed [7].

1.5 Smart building

Smart voice assistants and sensor assistant devices should be applied to public buildings as well as corporate buildings to save energy and resources [8].

1.6 Smart Security

The security system plays a crucial role in preserving the health of society, as well as preserving the resources including wealth, power and energy. It is necessary to maintain security from the home level to the level of defence. CCTV (Closed Circuit Television) systems, smart door locks, and mini vaults should be installed in each home. Using a smart GPS (Global Positioning System) along with a higher bandwidth of internet connection, local security should be able to view my movements and act within seconds. Defence should have smart weapons and defence systems suitable to their needs [9].

1.7 Smart Transport

Vehicles should be powered by low emission fuels (LEF) or, better yet, zero-emission fuels (ZEF) to reduce pollution in the area. Every vehicle, private as well as public, should have a GPS tracking system to ensure passenger safety and health, as well as provide records and safety measurements in case of an accident. Internet and technology can be used to control traffic systems from a master computer in a control room, therefore reducing the need for human traffic control [9]. The control room can even be used to monitor illegal activities. Human traffic patrols should be encouraged nonetheless. Construction of adequate roads, railways, and bridges should be a priority, ensuring their proper use when and where necessary. A better, faster, and more secure way of transportation should be developed for air travel and its stations [10].

1.8 Smart Energy:

The production of energy plays an important role in reducing pollution. Using more green energy, such as wind, water, or solar, can reduce pollution to a minimum. Thus, using any kind of fossil fuel energy should be discouraged [11].

1.9 Smart Waste Management

Using modern equipment, nothing should go to waste. Any kind of waste can be utilized as required. Mostly biodegradable wastes, that are organic, are usually left out for decomposition in nature. But with proper care, they should be recycled and reused. Artificial polymer fibres like plastic should not be dumped in nature, rather they can be recycled into other forms to be reused as required [12].

1.10 Smart Resources:

The economy and resources should be preserved securely for enhancing the livelihood of each and everyone living in the city. Installation and maintenance of smart devices and machinery cost a huge number of resources. Availability of daily requirements including foods and hardware equipment should be sustained within the city. A government should be formed by the people themselves for the proper running of the city and its developments. Schools/colleges have to be set up to provide proper education and preach a better way of living to the upcoming generations. Children should have abundant time and place to play and to be nourished in the greens. Hospitals and other health care organizations should be set up with proper technologies and equipment to keep the city safe from diseases [13]. The government should look after newer and better ways for sustaining the way of living, forming a proper set of regulations and rules.

1.11 Smart Atmosphere

A vision of a proper pollution-free environment is to be obtained within the city. This enhances the wellness of living beings. Any kind of emissions from factories, wastes should be controlled using the required techniques which would keep the pollution of the environment in check. Water bodies and biosphere should be well reserved to secure the sustaining conditions for every bio-organisms. Bio labs are to be set up within the city to preserve the atmosphere [14].

1.12 Smart City:

All the small elements from their manufacture to utilization should be performed using green energy ensuring proper use of technologies and safety protocols. When all these are present in a particular area or city then that city can be called a smart city [3].

1.13 Turning Home into Battery:

A rechargeable cement battery has been becoming a realistic possibility changing the way to store energy by turning the walls of your house into a giant battery. “Researchers at the Chalmers University of Technology in Sweden developed cement batteries that can store around 10 times more energy than previously developed structures, even though at the moment they are still hundreds of times less energy-dense than a lithium-ion battery. It can help transmit and distribute electricity and store energy from renewable sources like solar and wind power. Batteries can help compensate for times when the sun is not shining or the wind is not blowing”. Here the technology works as, the concrete layer is sandwiched between iron-coated carbon fibre mesh (anode layer) and nickel-coated carbon-fibre mesh (cathode layer) attached with a solar panel, which will store energy and can be used when needed [16].

2. IMPACT ON SOCIETY AND FUTURE DEVELOPMENTS

With the increase in population, pollution and crime the requirement for smart city civilization has been increasing each day. A smart city ensures the proper way of living keeping pollution, crime and biosphere in check such that people and other living beings find it sustainable and economic. In recent developments, the concept of electric vehicles has been an uprising and been produced in ample quantities showing very less pollution along with green energy. However, the installation cost is heavy for most people and availability and production of smart equipment in abundant quantity is not yet possible, which makes up another reason for every city not developing to be a smart city. Whereas there has been a huge scope of its development in future when the products would be manufactured and be available enough and the people should have proper idea about its benefits to encourage building up more and more smart cities in future [15].

3. RECENT IMPLEMENTS

The United Nations has predicted that “70% of the world’s population will be living in cities and urban areas by 2050, lesser emissions and green energy usage will continue to rise with every passing year. The need for smarter urban transport networks, environmentally-friendly water disposal facilities and buildings with high energy efficiency are critical than ever. The annual report, conducted by the Institute for Management Development with Singapore University for Technology and Design (SUTD), ranks cities based on economic and technological data, along with their citizens’ perceptions of how *smart* their cities are”. “Singapore, Helsinki and Zurich have topped the list as the world’s smartest cities in the 2020 Smart City Index”. As more countries and cities continue to take up the smart city movement, smarter ways of living could be adopted with each passing year [1].

4. DRAWBACKS

However smart a city may be, utilizing all forms of renewable sources and waste products to develop a healthy and smart lifestyle, but setting up a smart city costs a huge amount in the first place. The equipment is not at all affordable for everyone. Even the maintenance cost is huge. Security management is a huge sector in smart city management. Setting up smart security in industries and every household is a challenge for the government of every country. Thus, worldwide acceptance of smart cities is practically impossible.

5. CONCLUSION

A smart home is highly beneficial to their users. Communicating, exchanging data and triggering action is much easier now with the use of smart home devices. Processes can be automated and schedules can be created engaging multiple devices. In terms of smart city, the innovative security system, transport and green energy play a hugely beneficial role in the everyday life of the people living in a smart environment. Regardless of all the benefits, the investment and maintenance costs have been the hardest hurdle to cross. Proper preaching about the benefits and putting an impact of the idea of a smart city in public may help a way out to have more smart cities in future days.

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