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IOT BASED CONTOLLING AND MONITORING OF SMART SOCIETY

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ABSTRACT

A Smart Society represents the next evolution in societal development where technology, data and human centered design converge to increase the best of life, economically productivity, environmental social goal. Building upon the foundations of smart cities a Smart Society integrates advanced smart infrastructure into every aspect of human activity including governance, healthcare, education, mobility, and social interaction.

This concept emphasizes inclusivity, ethical data use and sustainable development, aiming to create a more connected, efficient and resilient society. By fostering collaboration between citizens, governments and the private sector, Smart Societies aspire to address complex global challenges such as urbanization, climate change and digital inequality.

INTRODUCTION

Over a past few decades the emergence of technology and the ability to monitor and control things remotely has attracted researchers. Such needs are abundantly contributing to establish. The Smart societies rely on real time data, intelligent systems and participatory platforms to make informed decisions and deliver services more effectively. They empower individuals and communities through connectivity and access to information promoting innovation, transparency and a higher standard of living. The aim of a smart society is to foster a more connected, inclusive and resilient community. By collecting and analyzing data from various sources governments can make informed decisions that improve urban planning, public services and overall quality of life. The ultimate goal is to create a life future where people live in harmony with technology, leading to better social, economic and environmental outcomes. A smart society refers to a community or social system that integrates advanced technologies, particularly those related to information and communication technology to improve the quality of life, sustainability, overall efficiency.

LITERATURE REVIEW :

[1] The problem for Internet Hardware Developers is the pursuit of a purpose built Internet device or the pursuit of an Internet of Things solution that is flexible enough to adapt to changing sensor needs. Internet enabled devices can be brought to market very quickly. They often include a single integrated device that performs a dedicated function to meet the Internet needs of current objects limiting the expansion options.

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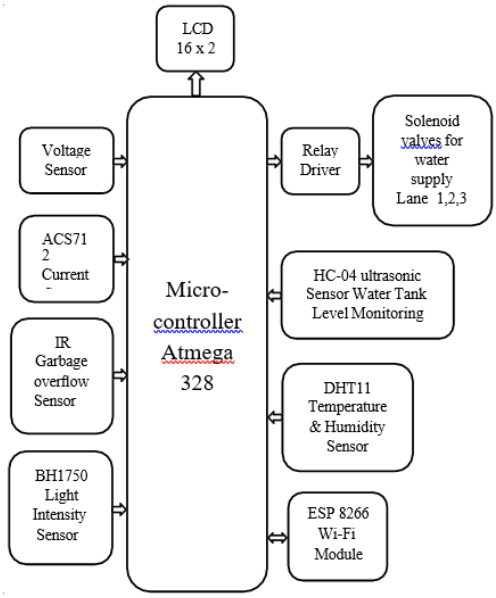
[2] Living in smart cities or smart homes or having applications turned to them, has become a reality for many people and when we put this applications into the world of Internet Of Things (IoT) we start talking about a better performance of results. This research develops an application for smart homes a smart power strip.

[3] Many companies are struggling with the uncertainity of Internet investment. Parkash, Prabu V, Dandu Rajendra (2016) have worked on developing a prototype of intelligent streetlights. They have optimized the power consumption by turning on the streetlights when the vehicle or the person approaches the streetlight and turning off the streetlights when vehicle or person goes away from the street light.

[4]The proposed system in this paper is based on an embedded system, PIC microcontroller and sensors that provide an economical solution. This is accomplished by detecting approaching the car using an IR transmitter and an IR receiver couple. When it senses movement, the sensor transmits information to the microcontroller, which causes the lights to flash. Similarly, as soon as a car or an obstacle moves the lights go out. The state of the light (On/Off) can be accessed from anywhere at any time by using the Internet.

BLOCK DIAGRAM :



INTERNATE OF THINGS(IOT) :

An IoT-powered smart society is a community where the Internet of Things (IoT) technology is deeply integrated into everyday life to improve efficiency, sustainability and the overall quality of life for it's citizens. In such a society a vast network of interconnected devices, sensors and systems work together to collect data, communicate and respond to various needs in real time.

The Internet of Things (IoT) refers to the fast network of physical devices, vehicles, appliances, sensors and other things embedded with software sensors and connectivity allowing them to collect exchange and act on data over the internet. These devices communicate with each other and external systems to make intelligent, data-driven decisions with minimal human intervention. The goal is to make the physical world more intelligent, connected and automated.

PROPOSED SYSTEM

It has been observed that at present many societies are using human resources to perform their day to day

activities that could be easily automated to save both time and human efforts. The project is mainly associated with daily activities happening in any society. Key points in the project are (A) Water Tank Level Monitoring, (B) Health Environment, (C) Waste Management, (D) Current/Voltage Monitoring, (E) Straight Lightning.

A. Water Tank Level Monitoring :

Float Sensors: A float is placed on the water surface and moves with the water level. The position of the float is monitored, and the level is determined based on its position.

An IoT-based water tank level monitoring system can greatly enhance water management by automating control, preventing overflow, and optimizing water usage. By integrating sensors, microcontrollers, communication modules and cloud-based data storage, these systems can provide real-time insights and allow for efficient, automated management of water resources. This solution is particularly useful for homes, farms, industrial applications, and public utilities, helping conserve water and reduce maintenance costs.

B. Health Environment :

The term "health environment" refers to the multifaceted aspects of physical, social, economic, and cultural dimensions that influence the health and well-being of individuals and communities. Understanding the health environment is crucial for developing effective public health policies, promoting wellness, and addressing health inequalities. Below are key components that help define the concept of a health environment:

Physical Environment:

Air and Water Quality: Pollution levels access to clean air, water and the presence of hazardous materials can significantly impact health.

Built Environment: Housing quality, urban design, transportation options and access to recreational spaces and healthcare facilities play a critical role in health outcomes. For example, neighbourhoods designed for walkability encourage physical activity, contributing to better overall health.

Green Spaces: Access to parks and natural areas can improve mental health, encourage physical activity, reduce stress. Community Networks: Social support systems, including family, friends, community organizations, play a virtual role in promoting health and providing emotional and material support.

Cultural Factors: Beliefs, traditions and practices influence health behaviours and attitudes toward healthcare access and utilization.

Socioeconomic Status: Income, education and job security can affect access to healthcare, nutrition, healthy living conditions.

C. Waste Management :

waste management projects could focus on designing systems to efficiently collect, sort, recycle, or compost different types of waste, including: developing automated waste sorting machines, designing optimized waste collection routes, creating innovative composting systems, building e- waste recycling facilities, or developing technologies to convert waste into energy sources like biogas always considering sustainability and environmental impact in their designs. Design a bin that automatically identifies different waste types (plastic, paper, organic) using sensors and directs them to the appropriate compartment. Develop an algorithm to design the most efficient waste collection routes based on geographical data and waste volume. Design a machine that can process plastic bottles into usable materials like filament for 3D printing. Create a system to effectively disassemble and recover valuable components from electronic waste.

D. Current/Voltage Monitoring :

Current and voltage monitoring are essential aspects of electrical systems, used in various applications, from industrial equipment and renewable energy sources to consumer electronics.

- **Safety** : Prevents overheating, device damage, and fire hazards by ensuring that current levels remain within safe limits.
- **Efficiency** : Identifies under performing equipment or components that draw excessive current, thereby optimizing the system's performance.
- **Diagnostics** : Helps in trouble shooting electrical issues by providing insights into how much current is being drawn at any given time.

E. Straight Lightning :

"Straight lightning" refers to a lightning bolt that appears relatively straight in its path, unlike the more commonly seen forked lightning, which branches out due to the uneven distribution of electrical charges in the atmosphere; this straight path occurs when the electrical discharge follows a relatively consistent path of least resistance, often happening in conditions with minimal air turbulence or uneven charge distribution within the cloud, making the lightning appear more linear in its descent to the ground. Most lightning strikes appear forked because the air is not uniformly ionized, causing the electrical discharge to follow multiple paths of least resistance, creating branches. When the electrical charges within the cloud are more evenly distributed, the lightning leader (the initial path of the discharge) can travel in a straighter line. Calm air with less turbulence can also contribute to a more linear lightning path. Straight lightning often appears as a bright, distinct line against the sky, with minimal branching.

APPLICATION

- **Energy Management :** Energy distribution systems that utilize IOT sensors to monitor usage patterns and adjust supply dynamically based on real-time demand.
- **Public Safety And Emergency Response :** Alert systems that provide real-time information during emergencies, such as natural disasters or public health crises.
- **Community Engagement :** Platforms that allow citizens to report issues (e.g., broken streetlights, potholes) and receive updates on city projects.

BENEFITS

- **Improved Quality Of Life :** Enhance convenience through automation and smarter city services, leading to a more liveable environment.
- **Increased Efficiency :** Optimize resource usage such as energy and water, reducing waste and costs for governments and citizens.
- **Data-Driven Decision Making :** Enable local governments and organizations to analize data for better policy making or resource allocation.
- **Sustainability :** Aid of the reduction in carbon footprints through smart management of resources, ultimately contributing to environmental sustainability.
- **Enhanced Public Safety :** Improve emergency response times and create safer environments through real-time data and communication**.**

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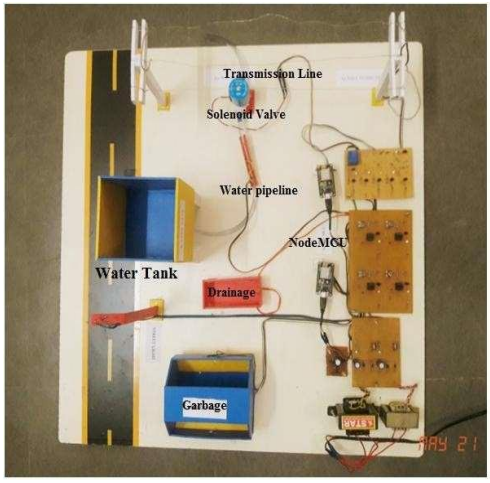
RESULT

Smart society typically revolves around several key areas. An IOT based controlling and monitoring system in a smart society can lead to substantial improvements in efficiency, safety, health and overall quality of life. The integration of IOT technology enables proactive management of urban challenges, ultimately fostering a more sustainable and liveable environment for all residents. As always, the successful deployment of such systems requires careful planning, robust cybersecurity measures, and community engagement to maximize benefits and address potential concerns.



FEATURES

Smart society encompasses a variety of features that enhance urban living, improve resource management and foster community engagement.

- **Smart Infrastructure Management :** Smart Lighting : Adaptive street lighting that adjusts based on pedestrian and vehicle presence, leading to energy savings. Waste Management: Sensors in trash bins to monitor levels and optimize collection routes, reducing costs and improving hygiene.
- **Public Safety And Security :** Surveillance Systems : Smart cameras for monitoring public spaces, with AI capabilities for crime detection and prevention.

  Emergency Response : IoT-enabled alarms and alerts for police, fire, and medical emergencies that automatically inform local authorities.
- **Energy Management :**

  Smart Grids : IoT integration in energy systems to monitor usage, predict demand, optimize energy distribution.

  Renewable Energy Management : Monitoring and controlling new renewable energy sources such as solar panels to maximize efficiency.
- **Smart Homes And Buildings :**

  Home Automation : Integration of IoT devices that allow residents to control lighting, heating, and appliances via smartphones.

Building Management Systems: Centralized control of heating ventilation and air conditioning to improve energy efficiency.

ADVANTAGE

- Improved Quality of Life
- Efficient Resource Management
- Sustainable Development
- Greater Economic Opportunities
- Enhanced Connectivity and Communication
- Better Governance and Transparency
- Improved Health and Well-Being
- Enhanced Safety and Security

CONCLUSION

Holistic approach that emphasizes inclusivity, privacy and security. Stakeholders including governments, businesses, and community members must collaborate to create a digital landscape that serves everyone and addresses challenges such as digital divide and data ethics. Ultimately, a smart society represents a pathway towards resilient, adaptive, and sustainable communities, where technology and human ingenuity work in harmony to create a more equitable future. As we move toward this vision, continuous innovation, thoughtful governance and active citizen participation will be crucial to fully realize the potential advantages of a smart society.

ACKNOWLDGEMENT

The acknowledgment of IoT's impact on controlling and monitoring smart societies reflects its transformative potential in enhancing urban living. By enabling real- time data collection, automation, and improved service delivery, IoT technologies empower communities to achieve greater efficiency, sustainability, and quality of life. As we continue to innovate and develop smart infrastructures, it is crucial to prioritize privacy, security, and inclusivity, ensuring that the benefits of IoT extend to all members of society. In this way, IoT will not only help build smarter cities but also foster a more connected and engaged community.

In conclusion, a smart society embodies the advanced technologies data analytics and connectivity to increase the better of life for citizens while promoting sustainable development efficient governance. While the benefits of a smart society are substantial, achieving this vision requires a

REFFERENCES

1. H. Arasteh, V. Hosseinnezhad, V. Loia, A. Tommasetti, O. Troisi and M. Shafie khah, P. Siano “Iot-based Smart Societys : a Survey”.
2. Elias Z. Tragos, Vangelis Angelakis, Alexandros Fragkiadakis and David Gondlegrd “Enabling Reliable and Secure IoT-based Smart Applications” The Society second International Workshop on Passive Systems for Smart Society, 2014.
3. P. Gokhale, O. Bhat, and S. Bhat, “Introduction to iot” International Advanced Research Journal in Science, Engineering and Technology, vol. 5, no. 1,2018.

4. M. Alaa, A. A. Zaidan, B. B. Zaidan, M. Talal, and M. L. M. Kiah, "A review of smart home applications based on internet of things," Journal of network and computer applications, vol. 97, 2017.
5. J. Ahmed, M. A. Razzaque, M. M. Rahman, S. A. Alqahtani, and M. M. Hassan, "A stackelberg game- based dynamic resource allocation in edge federated 5g network," IEEE Access, vol. 10, 2022.
6. J. Ahmed, M. M. Ashhab, M. A. Razzaque, and M. M. Rahman, "Execution delay-aware task assignment in mobile edge cloud and internet cloud," in 2019 International Conference on Sustainable Technologies for Industry 4.0 (STI), IEEE, 2019.
7. S. C. Sinthiya, N. I. Shuvo, R. R. Mahmud and J. Ahmed "Low-cost task offloading scheme for mobile edge cloud and internet cloud using genetic algorithm" in 2022 5th International Conference on Sustainable Technologies for Industry 4.0 (STI), IEEE, 2022.
8. S. Abdullah, E. Akter, M. S. Islam and J. Ahmed "Cost effective IOT based smart stick for visually impaired person" in 2022 4th International Conference on Sustainable Technologies for Industry 4.0 (STI), IEEE
9. H. Tahaei, F. Afifi, A. Asemi, F. Zaki, and N. B. Anuar, "The rise of traffic classification in iot networks: A survey," Journal of Network and Computer Applications, vol. 154, 2020.
10. K. Mandula, R. Parupalli, C. A. Murty, E. Magesh and R. Lunagariya, "Mobile based home automation using internet of things" in 2016 International Conference on Control or Instrumentation Communication and Computational Technologies (ICCICCT), IEEE, 2015.
11. S. Kousalya, G. R. Priya, R. Vasanthi and B. Venkatesh "Iot based smart security and smart home automation" International journal of engineering research & technology (ijert), 2019.
12. N. Hossain, M. A. Hossain, R. Sultana, and F. A.Lima, "A security framework for iot based smart home automation system," Global Journal of Computer Science and Technology: E Network, Web & Security, vol. 18, no. 3, 2018.
13. H. Singh, V. Pallagani, V. Khandelwal, and U. Venkanna,"Iot based smart home automation system using sensor node," in 2018 4th International Conference on Recent Advances in Information Technology (RAIT), IEEE, 2018.
14. P. Kuppusamy, "Smart home automation using sensors and internet of things," Asian Journal Of Research In Social Sciences And Humanities, vol. 6, no. 8, 2016.
15. Rahman, M. A., Asyhari, A. T. Leong, L. S. Satrya, G. B., Hai Tao, M., & Zolkipli, M. F. Scalable machine learning-based intrusion detection system for IoT-enabled smart cities. Sustain. Cities Soc., 2020.
16. Sharma, N. Sham kuwar, M., & Singh, I. The history, present and future with IoT. Intelligent Systems Reference Library Internet of Things and Big Data Analytics for Smart Generation, Springer, 2018.
17. Li, S. Da Xu, L., & Zhao, S. The internet of things: a survey. Inf. Syst. Front., 2015.