How Technology Transforms Our Homes

Abstract— **This paper discusses the benefits of Smart Homes from environmental, e.g. energy efficiency, and societal, e.g. assisting impaired people and increasing safety perspectives. It also addresses the main risk of the core technology for Home Automation, Internet of Things (IOT), which is data security.**

Keywords— *Smart Homes, IOT*

I. INTRODUCTION

Technology involves developing new tools or techniques for better quality of life through improving communication, health, environment, etc. It provides value in terms of enhanced time efficiency, power efficiency, size and cost, e.g. price, in the form of a product or a service.

Smart Homes use IOT to automate temperature, lighting within home. Furthermore, using smart grids and smart meters, it optimizes the use of solar panel output to run home appliances. Moreover, it allows these functions to be controlled remotely. IOT is a technology which transforms any object into a smart one by embedding in it an electronic device with sensors and computing power and connecting it to the internet. Cloud computing is an integral part of this technology as it allows for provisioning computing resources through the internet such as storage and software applications.

II. SMART HOME BENEFITS AND CHALLENGES

A. Energy Consumption

One important benefit of Smart Homes is reducing energy consumption which is an environmental major concern especially that according to [1] nearly 40% of global energy consumption is by residential and commercial buildings due to energy consumed by appliances, ventilation and lighting. Smart homes are one of the EU's 10 priority action areas in its Strategic Energy Technology Plan: "Create technologies and services for smart homes that provide smart solutions to energy consumers" [2].

B. Disabled and Elderly

Another benefit of Smart Homes is improving the quality of life for disabled and elderly. In [3], specific requirements for assisting disabled people in controlling Smart Homes [4] and improving their independency are mentioned including voice control and indoor navigation system [5] for visually impaired people, touchscreens for hearing impaired people, head tracking devices, facial detection, and eye movement control in addition to robotic systems for movement assistance for physically impaired people.

C. Safety

Also, IOT in Smart Homes could be used for advanced hazard detection and response system. In [6], a system is proposed which is capable of detecting smoke, different flammable gases and fire and providing hazard location coordinates to the nearby fire department. Furthermore, in [7], the fact that visual sensor networks have become smarter through improved storage and processing capabilities is highlighted which leads to advanced real-time processing of data from multi sensors to detect and respond to abnormal events as in the case of intrusion.

D. Challenges

However, using IOT in Smart Homes increases the risk of data insecurity as some research, [8], indicated in 2013 that more than 25% of hacked internet connected devices were other than computers including smart TVs and other home appliances.

III. CONCLUSION

As computing power, sensors technology, and communication networks, become more advanced, Smart Homes will become more fulfilling to its users' needs. However, the main challenge is privacy and data security.

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