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APPLICATIONS OF INTERNET OF THINGS (IOT) IN HEALTHCARE: A COMPREHENSIVE SURVEY

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Abstract

In complementing and improving current healthcare systems, comprehensive research has been devoted to the exploration of different technologies such as information technology (IT). In particular, the Internet of Things (IoT) has been widely used to connect available medical services and provide elderly and chronically ill patients with a secure, productive and smart healthcare service. The goal of this paper is to summarize the IoT applications in the healthcare industry and to identify the trend of intelligentization and future research directions in this area. The development of IoT in healthcare systems has been studied from the perspectives of enabling technologies and methodologies, IoT-enabled smart devices and systems, and various IoT applications in the healthcare industries, based on a systematic literature review and the discussion of the researchers' achievements. Finally, the challenges and prospects of the development of IoT based healthcare systems are discussed in detail.

Keywords: *Healthcare, IOT, Information Technology, Mental Condition, Medical Rehabilitation, Patients.*

I. INTRODUCTION

The rising rate of the ageing population has created many healthcare service challenges. The after-stroke recovery program for the elderly, for example, is an evolving problem that involves a long-term commitment to medical and human capital [1]. Medical rehabilitation, initiated in the middle of the 20th century, is a relatively recent subject and has been treated as a new branch of therapy aimed at alleviating or curing physical or mental conditions through the remediation or restoration of disabilities [2].

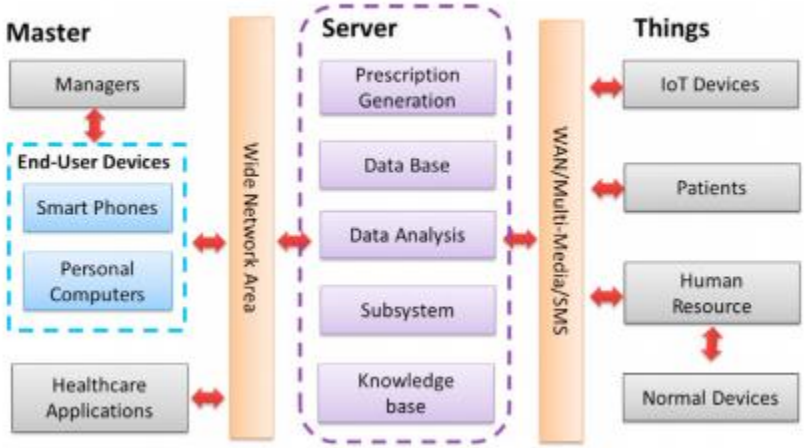

Figure 1: Illustrates the block diagram of the transmission and reception arrangement [3]

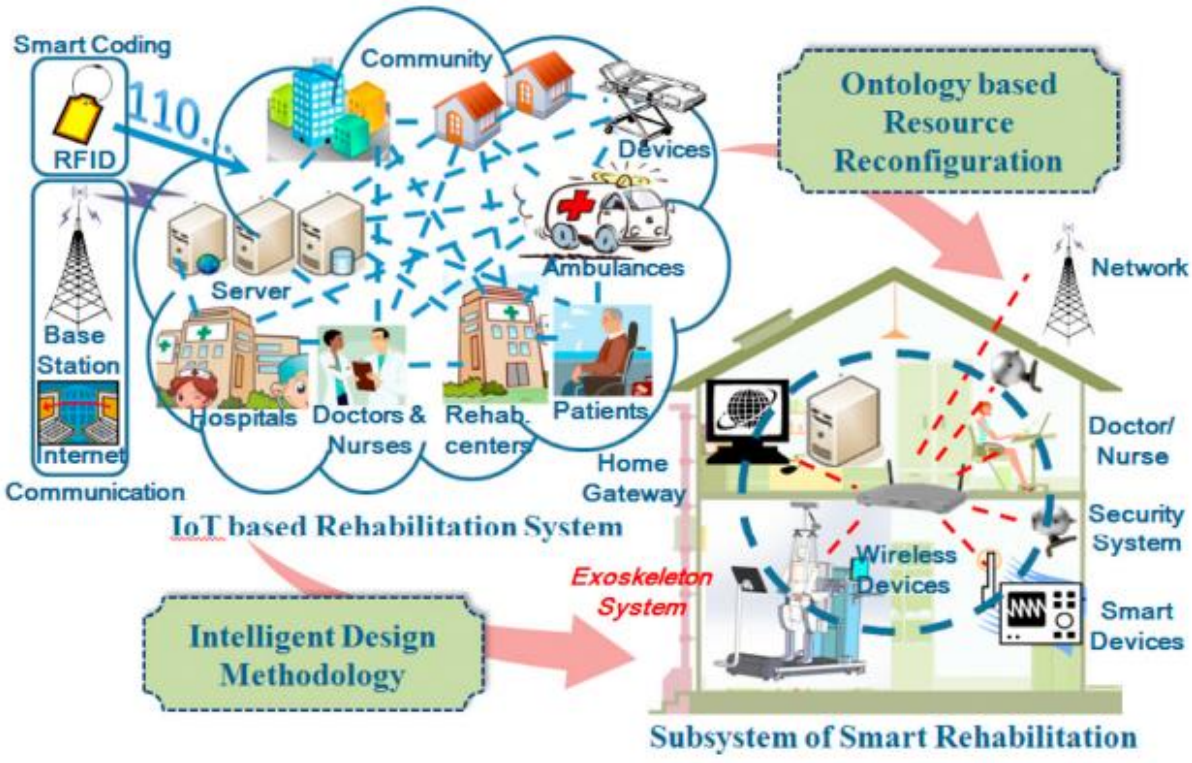

Figure 2: Illustrates the framework for the internet of things (IoT) rooted smart rehabilitation system [4]

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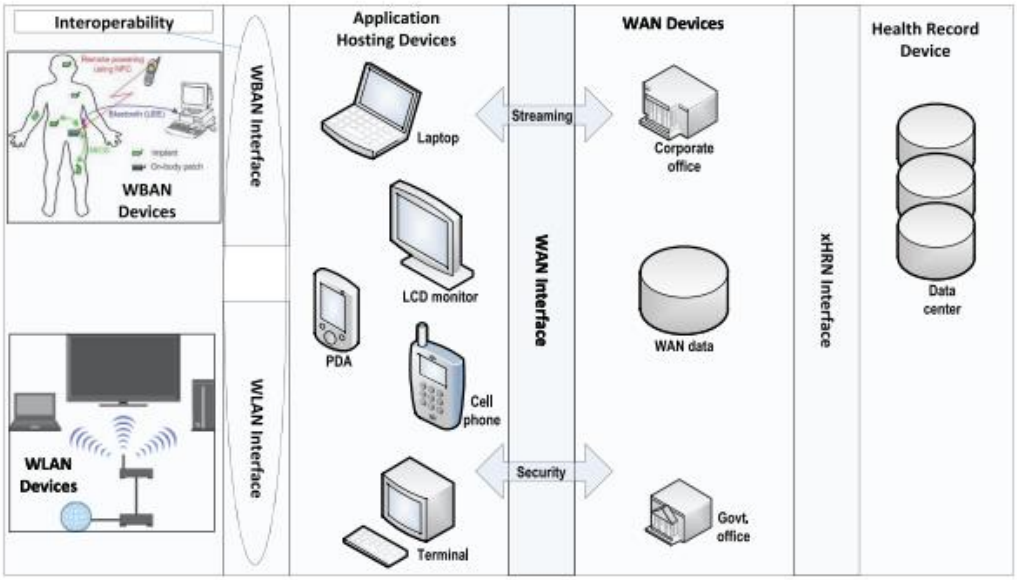

Figure 3: Illustrates the Continua Health Alliance's framework [4]

The Internet of Things (IoT) is a notion that represents anyone, everything, anywhere, wherever, any service, and any network connected. In next-generation technology, the IoT is a megatrend that can influence the entire market continuum and can be considered to be the interconnection of uniquely recognizable smart objects and devices with expanded benefits within today's internet infrastructure. Usually, the advantages include the advanced networking of these devices, systems, and facilities beyond machine-to-machine (M2M) scenarios [5].

II. LITERATURE REVIEW

Xu et al. performed a study using trust-based multicast systems on a stable mobile healthcare system. The rapid growth of wireless and mobile networks has stimulated large implementations of mobile electronic healthcare systems leading to the implementation of telecommunication technology in telemedicine services. Protection, however, is an important requirement of the system since many patients have privacy issues when it comes to sharing their personal details over open wireless networks. For this purpose, this research examines the characteristics and security concerns of a ubiquitous and mobile healthcare system consisting of a variety of mobile devices and sensors connected to a patient with wireless and pervasive data communications [6].

III. DISCUSSION AND CONCLUSION

Researchers across the globe have begun to explore various technical strategies to transform the provision of healthcare in a way that complements current programs by mobilizing the IoT's capacity. This paper explores various aspects of IoT-based healthcare technology and presents different structures and platforms of healthcare networks that support access to the backbone of the IoT and promote transmission and receipt of medical data. In IoT-driven healthcare systems and applications, significant R&D efforts have been carried out. The paper also presents comprehensive research activities on how pediatric and elderly treatment, chronic disease supervision, private health, and exercise management can be handled by the IoT. The paper offers a broad view of how recent and ongoing advances in sensors, devices, internet applications, and other technologies have motivated affordable healthcare gadgets and linked health services to unlimitedly expand the potential of IoT-based healthcare services for further development for deeper insights into industry trends and enabling technologies. The paper considers different security criteria and challenges to better understand IoT healthcare security and unveils numerous research problems in this field to suggest a model that can minimize associated security risks.

IV. REFERENCES

[1] S. Kumar, A. Gupta, and A. Arya, *Triple Frequency S-Shaped Circularly Polarized Microstrip Antenna with Small Frequency-Ratio*. International Journal of Innovative Research in Computer and Communication Engineering (IJIRCCE)/ISSN(Online): 2320-9801, 2016.

[2] E. N. Kumar and E. S. Kumar, “A Simple and Robust EVH Algorithm for Modern Mobile Heterogeneous Networks- A MATLAB Approach,” 2013.

[3] M. Padmaja and S. Shameem, “Secure Image Transmission over Wireless Channels,” 2008, doi: 10.1109/iccima.2007.38.

[4] M. Ahmad, M. N. Doja, and M. M. Sufyan Beg, “Security analysis and enhancements of an image cryptosystem based on hyperchaotic system,” *J. King Saud Univ. - Comput. Inf. Sci.*, 2018, doi: 10.1016/j.jksuci.2018.02.002.

[5] M. A. El-Iskandarani, S. Darwish, and S. M. Abuguba, “A robust and secure scheme for image transmission over wireless channels,” 2008, doi: 10.1109/CCST.2008.4751276.

[6] L. Da Xu, W. He, and S. Li, “Internet of things in industries: A survey,” *IEEE Transactions on Industrial Informatics*. 2014, doi: 10.1109/TII.2014.2300753.