Bulletin of Environment, Pharmacology and Life Sciences
Bull. Env. Pharmacol. Life Sci., Vol 11 [5]April 2022 : 44-49

Online ISSN 2277-1808
Journal's URL:http://www.bepls.com
CODEN: BEPLAD

ORIGINAL ARTICLE **OPEN ACCESS**

Develop IOT Technology to scale up existing treatment options to provide a healthcare solution

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ABSTRACT
In terms of connectivity, interactivity, and interchange of intelligently linked sensors, items, systems, information, and programs, the Internet of Things (IOT) has had a massive effect and changed the world of technology. Indeed, IOT has significant effects on the global economy and human interaction in a wide range of development fields, especially medical care. IOT should be considered for seamless collaboration and communication between things and individuals in the ecosystem. As a result, it was critical to accept the possibilities and advantages of IoT technology in medical care delivery the system to achieve that lives are saved the quality of life was improved through the use of intelligent connected equipment. In this article, we concentrate on IoT-based medical systems of malignancy care and financial monitoring operations associated with the implementation of IoT/WSN technologies to supplement existing treatment options and supply healthcare solutions. In this case, the company's monitoring capabilities act as facilitators of meaningful intelligence, decision-making, information transmission, and monitoring to improve cancer therapies. We also provide many platforms and structures to demonstrate but instead enable the functioning IoT-based technology that is being evaluated and utilized to our recommended intelligent medical care system malignancy care facilities. Furthermore, it should be critical to comprehend and explain some of the security and financial difficulties that plagued the IoT-enabled medical care system.
Keywords: *Intelligent systems; IOT/WSN technology; medical care*

Received: 25.02.2022 Revised: 12.03.2022 Accepted: 24.04.2022

INTRODUCTION

The internet of things is one of the most current clever notions of the contemporary era, with significant implications across every part of human endeavor and greater possibility for smart life [1]. Devices, the internet, and apps are linked through IOT to allow for the interchange of data and information, enabling and activating a range of services [2-4]. Google, for instance, has lately used the Internet of Things to test self-driving cars that communicate with the transport network and traffic conditions. The automobiles should drive and navigate themselves throughout the city and highway in this concept, where both driver and driverless vehicles were connected with the local transport equipment to ensure safe and protected driving [5].It should be predicted by 2020, the amount to double again, by 2030, and it would have nearly trebled [6]. Furthermore, there was an upsurge of investigation and development of countries through an effort to lessen the disease's threat and improve the quality of life on the people [7]. This does not come to a price. It's incredible to learn that a significant amount was spent on malignancy treatment research and innovation, with millions of dollars being invested yearly [8]. Given the aforementioned factors, the goal to enhance malignancy care delivery has encouraged and instructed this study [9]. To supplement existing therapeutic approaches by incorporating the advantages of its IOT technology into carcinoma care facilities through ingrained intelligent connected systems and sensors [10].

RELATED WORKS

Through systems integration that facilitates medical area broad connections, this relatively recent development in IOT technology should assist in assuring interconnection and compatibility among medical clinics, pharmacies, and hospitals in diverse regions [11-13]. It goes saying that the IOT has substantial advantages, such as enhanced patient-doctor-nurse interactions, lower costs, increased overall revenue prospects, greater Return on Investment (ROI), better corporate strategy, and increased collaboration between medical professionals and consumers [14]. So far, in the sphere of medical services and applications, IOT/Wireless Sensor Network (WSN) technology has achieved extensive and unparalleled adoption in medical care organizations.

This contains, for example, a restoration program that utilizes Radio Frequency Identification (RFID) and a Wi-Fi connection, malignancy care and corporate analytics assistance, patient reporting to intelligent connected gadgets and the Global Positioning System, health service, health and nutrition checking, distant surveillance system, implementation assistance system, ambulance service scheme, remote patient monitoring, elderly care, and advanced therapy [15-17]. The implementation of IOT malignancy care facilities initiated research in this area [18], as we already said in our articles. In summary, this study builds on our prior work including additional features that were not before handled of the application to WSN and internet applications of malignancy care infrastructure to propose a smart medical approach.

MATERIAL AND METHODS

Figure 1 depicts the interconnection of IOT-related ideas to medical resources in the medical system. There are numerously connected or intelligent gadgets that use effective communications standards and are competent in linking and engaging through IOT access networks that are attached to medical resources of the IOT organizational levels at the data management computer repository. The edge layer, the fog surface, and the cloud layer are the three data administration levels. All of these ideas and connections would come together as they develop intelligent cancer care technology solutions.

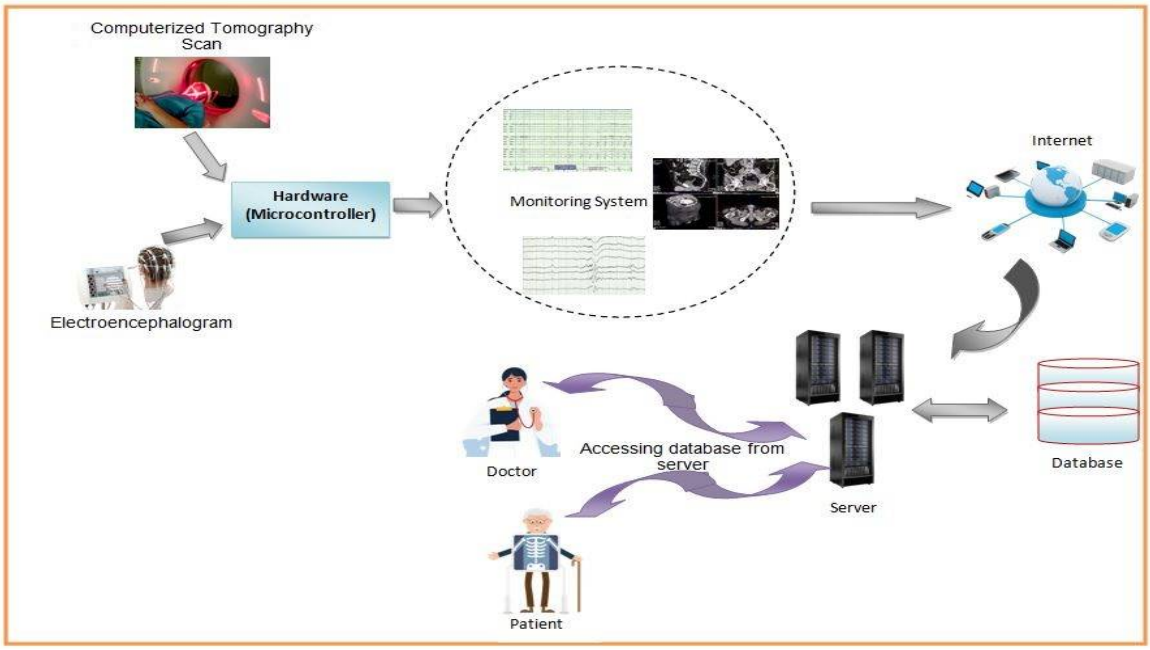

Figure 1: IOT in healthcare

Figure 2 illustrates the proposed program's IOT-based medical system architecture, which depicts the interrelations of multiple elements that are influenced by the network design methods. Some aspects and techniques to be used in delivering the conceptual framework are captured in the structure. It also outlines how the system integrates and transports the network capacity generated to the networked devices through the system.

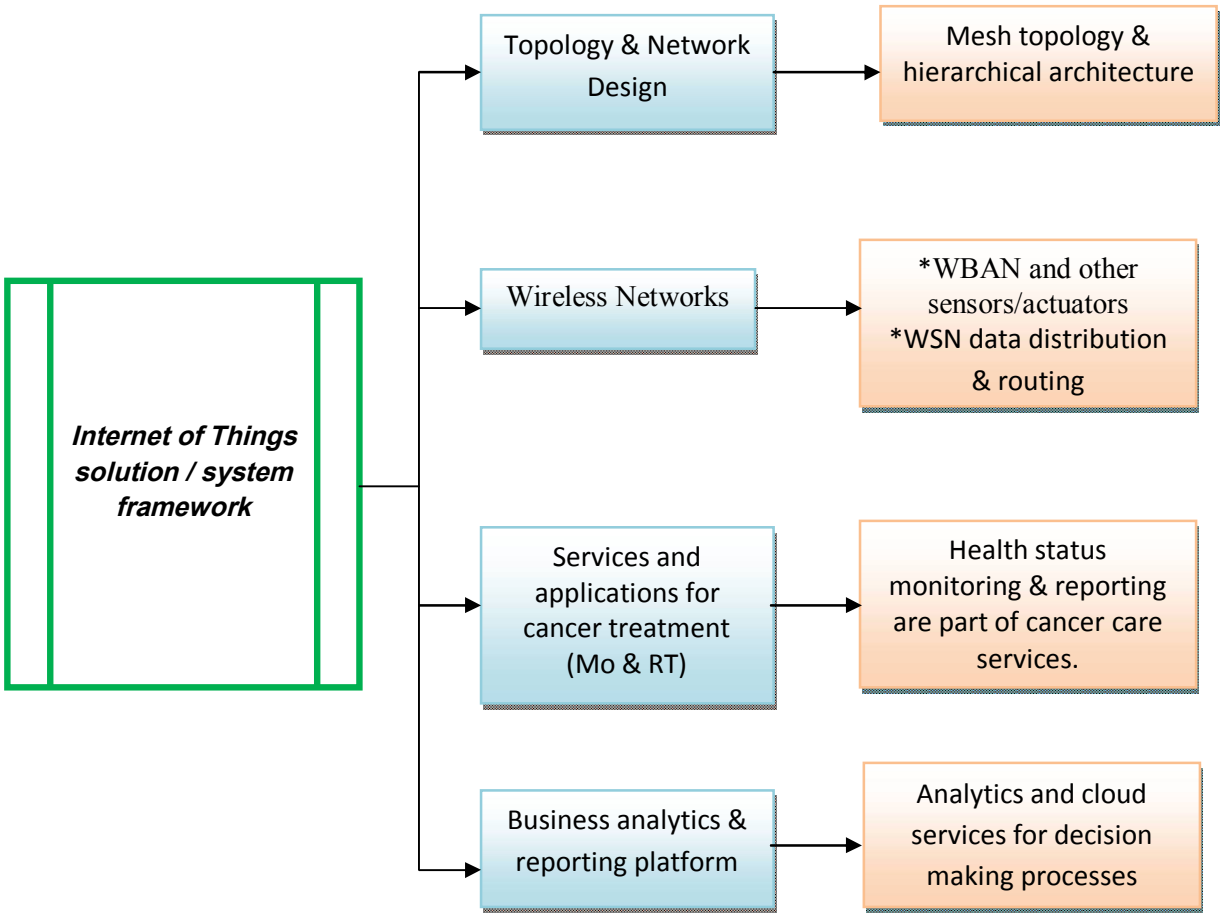

Figure 2: Flow diagram of IOT medical technologies

RESULTS AND DISCUSSION

Roles intelligence-connected gadgets and wearable networks play in IOT design and evaluation; we can't talk about it without mentioning them. These devices will be deliberately linked to insert within the human body or inserted to a particular region to assess the individual monitoring, therapy, or evaluation to acquire verifiable data for all operations. The detectors networks establish independent mobile ad hoc networks that are linked to the central network they are installed.

Financial information through devices is being transferred and directed inside the channels of data center location through digital services, as WSNs appear to be useful in many applications with the medical environment. Several aspects, including routing algorithms from one origin to the other, should be considered in data transmission over WSN [19]. To assure computation and communication capacities, it should be vital to use an effective routing protocol in WSNs that could manage the trade-off between convergence and economy.

There are many different service configurations of network communication in the construction of a system. A full mesh topology was presented since the goal is to find the optimal solutions that suit the requirements of an intelligent health service. Every device of the network was connected to every device on a network. The proposed IOT-based healthcare system includes products and a diversity of methods and circumstances of sufferers, which are delivered by people in the circle of service.

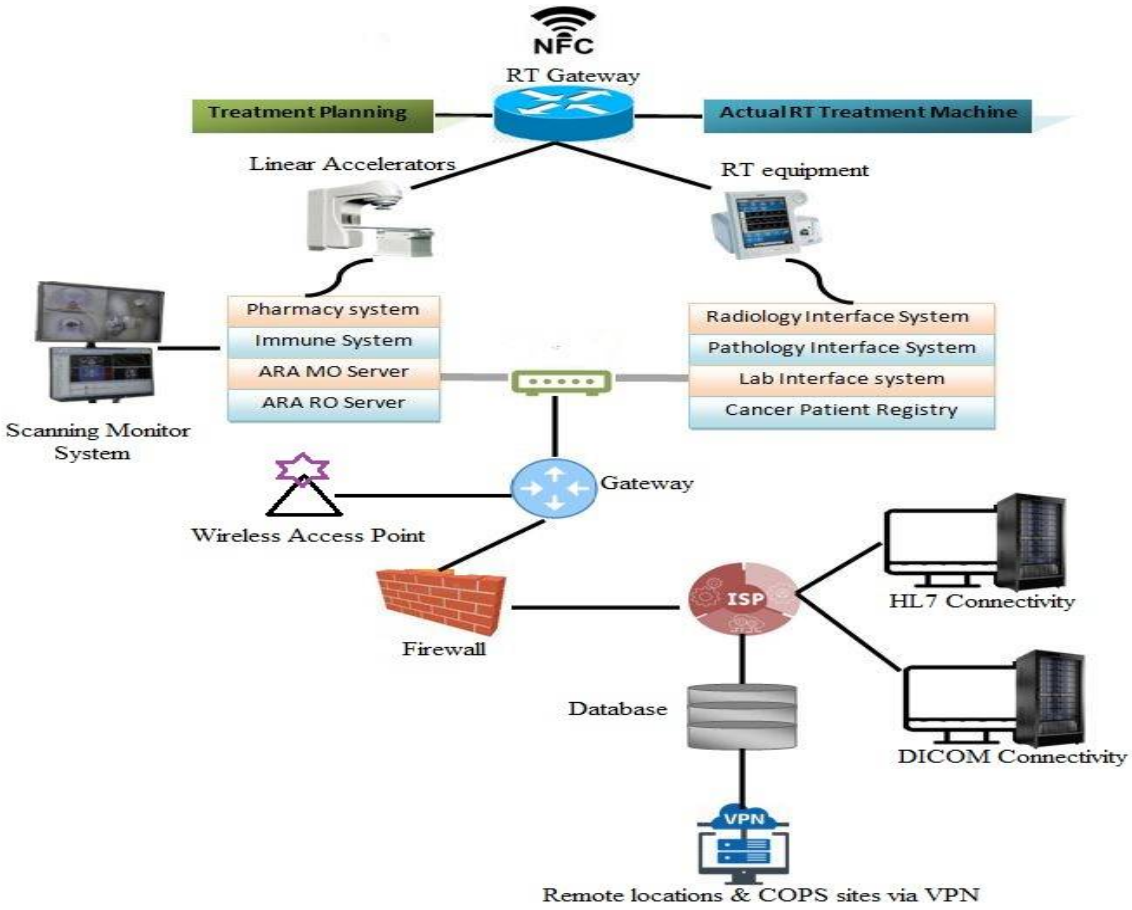

Figure 3 Network model for malignancy care facilities

The Medical Level-7 interconnection, as shown in Figure 3, uses XML technology to connect two or more processes of information generation, message exchange, exchanging, and utilizing within and across lab centers and facilities. Digital photography but also Connectivity through Medicine interconnection, on the other contrary, communicates to multiple types of technology for diagnostic image transfer, while operating devices, Pathology Interface System, Radiology Interface System and Laboratory Interface System serve as entry points of medical professionals to record individual data concerning to lab tests, malignancy or clinical findings, and diagnostic outcomes, respectively. The malignancy tumors that originate from tissue cells could be seen through the patient pathology reports integrated with the PIS. It's important to note that biological activities that occur during the development or generation of cancer cells explain why tumors could develop through cells at various stages of differentiation. To summaries of these technologies, and dispensers, radiation oncology servers and medical oncology provide a record of adequate patient record data on a machine in the clinic through distant VPN records to outside the hospital. A planned malignancy care providers' network architecture is depicted in Figure 3.

Securing IOT services

As a result, ramifications for patient data and information should be monitored and handled at every stage of the approach. As a result, some potential safety methods relevant to this study include but are limited to the protection of IOT connectivity. Because of the characteristics of the medical context, safety structure but also methods of intelligent linked, WSN, and external devices should be an ultimate priority in terms of communication IOT system through a level to network infrastructure. Security procedures for the connected phones and WSNs to categorize the IOT remedy should be ensured by protecting the routing algorithms to prevent violence that might damage the entire system. This is hacked gadgets could be used to assault the IOT-based system. When a long-term gadget or sensitive function was combined with the participation of human life, the usage of less energy system and detector were addressed. Wireless Networks usage of reduced energy IPv6 structure of the development to IOT-based remedy of less energy consumption of safe incorporation; and safety, confidentiality, and decryption to a detector, distant gadgets were extremely vital. They use a safety method that allows device-level verification and link cryptography.

Comparison between proposed systems

Table 1 demonstrates the originality of this study, particularly when considering the degree of difficulty, safety, dependability, consistency, obstacles, and activities concerned. As we go from responsive to preventative medical care, we should acknowledge that the enterprise architecture vision of the Intelligent Comprehensive IOT Medical System for Cancer Care has been successful.

Despite the use of IOT technologies, every article offers diverse ideas. Nevertheless, as earlier said, they could confirm of our proposed scheme makes use of a range of IOT-enabled gadgets, owing to the large number of heterogeneous systems that we have concentrated on. It also makes use of a range of entry systems and communication requirements to assure the supply of reliable services that were only mentioned in passing to other documents. This article and one other article that utilizing GPS location monitoring as a requirement. In effect, our proposed approach appears to cover all malignancy care facilities, whereas others appear to cover only a broad range of healthcare services. Likewise, that speaks about improving malignancy care uses mobile health technologies rather than IOT to accomplish its recommended solution.

Table 1 Comparison of the proposed systems.

Sl.	Variables	Proposed paper	Paper 1
1	IoT devices	WBAN, WSNs, sensors, actuators, IOT-medical devices, RFID, wearable's, wrist bands.	Wearable's (e.g., BP), heart rate sensors, smart devices & mobile apps
2	Cancer care services	Extensively covered cancer care as the whole with treatment options. No specific cases are mentioned	No covered except healthcare wellness & therapy. Only stated collaborative cancer cloud platform as a cloud service for cancer research
3	IOT access methods	BLE, ZigBee, NFC, wireless HART, wireless mobiles, LoRaWAN, LPWA, IEEE 802.15.14	Not specified
4	GPS location tracking	Utilized	None
5	Routing protocols	Utilized	None

There are several heterogeneous intelligent homes, apps, and internet connectivity methods in the architecture of the IOT-based platform. All of these factors have the potential to create serious operational and functional difficulties in every aspect of an IOT-based design process. Despite disclosing the patient descriptive statistics to the research organization and business specialists, problems of confidentiality of data were a worry for business intelligence. As a result, they would eventually verify that patient-sensitive data was safeguarded and secured could be the main risk and impediment to reaping the possible advantages to company technology platforms in the medical environment, which handled, could hinder company advances. Since this potential solution includes a variety of terminals, wireless connections, and detectors, they must verify that these gadgets comply with industry standards to assure dependability and safety. Furthermore, communication network stability was critical, particularly considering the nature of the medical setting and the delicacy of individual data. One of the reasons the network model was advocated, particularly at the interconnection point, was that information sent of the origin was received at the target in a fair amount of time. It's also about ensuring high reliability with the least amount of downtime but also personal involvement.

CONCLUSION

Researchers suggest the adoption of an IOT-enabled medical system for improved cancer patient medication, diagnosis, identification, and surveillance based on cancer care facilities as facilitators of meaningful intelligence, decision making, data transfer, and monitoring to this study. WSNs and smart linked devices have been used to implement the medical approach. The WSN plays a critical role in allowing a large number of spatially distributed autonomous of are connected to the network fabric via geographical navigation through sender at the receiver, facilitating data communication and interchange. We've also looked at company evaluation and network services to support those patient records streams are available for meaningful intelligence and evidence-based medical care decisions. The nature of the surroundings but also important to individual data, the operational and safety concerns connected of the implementation to IOT-based clinical systems are also handled. This is required ahead of the IOT-based system process go-live phase to prevent the existing network from failing and patient information from being compromised.

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CITATION OF THIS ARTICLE

AmjanShaik , S.Sivasubramanian,P.FelcyJudith,D.Vijayanandh,R.S.Sabeenian. Develop IOT Technology to scale up existing treatment options to provide a healthcare solution. Bull. Env. Pharmacol. Life Sci., Vol 11 [5] April 2022 : 44-49.