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The purpose of this study was to develop a novel IoT-enabled health diagnosis and monitoring model for minors and female students using machine learning to create a secure virtual health environment.

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abstract

With the use of IoT, high-tech health monitoring systems have been developed. The emotional and physical health of an individual may be monitored using such a device. Common mental and physical ailments may be traced back to stress, worry, and high blood pressure. Stress, anxiety, and hypertension are all common among the elderly and need specialised care in this environment. Early detection of health issues by monitoring of stress, anxiety, and blood pressure is key to avoiding irreversible harm. The quality of life of patients, carers, and healthcare providers will all improve as a result. Using covert wearable sensors and machine learning methods, develop innovative technological solutions for real-time monitoring of stress, anxiety, and blood pressure. With the use of artificial intelligence, researchers were able to identify artefacts in BP and PPG data. The idea was put out to filter the blood pressure signal to get rid of any anomalies caused by motion. Then, the systolic blood pressure (SBP) and diastolic blood pressure (DBP) connection was analysed using eleven characteristics extracted from the sociometric waveform envelope (DBP). In this study, we demonstrate the efficacy of a computational approach to calculating blood pressure. Predicting systolic and diastolic blood pressure readings from PPG signal features is accomplished by using sophisticated regression in the suggested architecture.

Introduction

Several examples of IoT use show substantial enhancements to healthcare delivery systems. Health care is an important profession since people's lives depend on it. Researchers have a hard time trying to digitise the procedure. They are always developing novel methods for improving the quality of digital health care services. The Internet of Things is quite important in this area. Cisco estimates that by 2020, fifty billion devices will be continually connected to the internet. The success of the Internet of Things in areas like clinical device integration, telemonitoring, savvy sensors, glucose screens, prescription containers, fitness trackers, and wearable biometric sensors may serve as a model for us to follow. The most recent developments in computerised medical services include uncommon applications like smart medications, smart beds, individual medical care, keen home consideration, and Real-Time Health Systems (RTHS). Remote patient monitoring is another method for introducing high-quality medical services to large populations. Given the high rates of mortality among mothers and children in developing and post-industrial countries, health care for women and children is a crucial part of any government's agenda. According to the Sustainable Development Goal (SDG) Report in 2016, the global rate of maternal mortality decreased by 44% between 1990 and 2015. When it comes to maternal and infant health, the World Health Organization (WHO) places an unusual emphasis on prenatal care. In order to raise awareness about health, obesity, and mortality, developers of eHealth and mHealth frameworks are creating specialised medical care apps for women and children.

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Many factors, such as access to insurance, financial constraints, and the lack of effective treatment options, create significant challenges for children's health care. The dynamic support rate of women and children is required to clean the present medical care offices available to them. Some workouts, accurate knowledge on food, a balanced diet, and the prevention or treatment of dangerous diseases are all components of a healthy lifestyle. Clients are more easily integrated into medical care systems when such apps are used. Designers of mHealth and eHealth arrangements learn about client relationships, the limitations of standard frameworks, and constructive criticism. The needs of the client should be taken into account while developing a novel approach. After extensive study on security, conventions, embedded devices, applications, interoperability, and business models, IoT's dynamic functions are making it possible to ensure customer experience. Many countries are using substantial policies and regulations to speed the spread of innovation. Medical treatment for women and children is seen to be special because of their vulnerability and the potential for devastating outcomes. To ensure their continued health and happiness, the best possible structures must be put into action. Growing healthcare costs, though, may slow the whole system down. Medical care providers may breathe a sigh of relief knowing that a variety of software and ancillary devices are at their disposal to help alleviate some of the financial burdens they are now carrying. Constant improvements to the Internet of Things are making this a reality.

The research aimed to:

Determine the nature of the female patient's interaction with rural health care providers in relation to identified medical issues.

- The goal of this project is to develop a structure that will allow the doctor and female patients to communicate with one another in a secure environment.
- Goal: to use IoT to create a medical framework and integrated platform.
- Research on the use of LPWAN for transmitting data from medical devices is the goal of this project.
- The goal of this project is to provide a framework for analysing data from medical devices and providing that analysis to the patient's doctor.

Literature Review

R. Prasad and H. Kobayashi [2] propose a nine-step multi-philosophy configuration measure model to improve the efficacy of equipment portrayal language plans; this model includes framework determination, framework division, displaying or variation, segment reproduction, framework authoritative, framework reproduction, pre-combination adjustment, rationale blend, and rationale re-enactment. This technique allows for a 31% and 16% decrease in the time needed for displaying and reproducing compared to the standard way of describing equipment using language. S. A. Mengele et al. [3] detail the three phases of the planning process as the following: (1) determining needs; (2) developing a strategy to meet those needs; and (3) putting that strategy into action. During the requirements phase, designers first isolate the problem's overarching idea and provide a framework diagram. At this point of the planning process, it will be necessary to effectively integrate the substance flowchart, a more refined version of the recommended chart, into the framework at hand. To further guarantee that the basic principles have been met, approval and confirmation should be performed after each DM phase. The efficacy of the mind-boggling hardware framework plan is said to be enhanced by H. Estelline’s suggestion of adding two polls to the traditional four-stage hardware framework plan (framework plan, gadgets plan, mechanical plan, and assembly plan) [4].

Those polls are then used to outline the specifications for the various parts of an electronic system. A "logical, grounded, intelligent, iterative, adaptable, integrative, and relevant" [5] plan-based assessment is essential in the eyes of F. Wang and M. J. Hannifin. Based on this assumption, they establish nine rules for plan-based exploration, including: keeping the plan in place from the beginning of the research; establishing realistic targets for hypothesis advancement and constructing an underlying arrangement; conducting the examination in delegated real-world settings; working closely with members; implementing research techniques methodically and intentionally; breaking down information rapidly, persistently, and reflectively; refining plans constantly; archiving them in a logical fashion. A. Saini and P. Yamagata’s [6] m-healthcare framework focuses on the individual user. When creating software, developers often use the article-based framework planning technique, which is then followed by an investigation into the connections between the framework's needs and the client's intended results. Client-driven planning is particularly beneficial in health-related applications, as partners and various types of clients may transmit diverse needs and restrictions. The proposed DM strategy by M. Ahmad considers five different aspects of a plan, including the probability of disappointment in the objective field, the expected use climate, the expected use climate use conditions, the expected use of the fenced-in area, and the expected use of the item within the fenced-in area [7]. The approach appears reasonable for testing the longevity of an IoT objective (IoT). It takes into account the framework's dependability as a whole, and employs a probabilistic method to assess the dependable nature of hardware under a variety of unforeseen conditions.

Researchers' Methods

This investigation makes use of many research methods, each of which is tailored to the specific nature and scope of the individual modules. For the sake of facilitating open lines of communication between doctors and their female patients: The original inspiration for the design came from the challenges faced by the Female segment in Rural areas while seeking to communicate with doctors. There have been several reports of women in the workforce complaining of harassment after going to non-government village doctors because of their lower levels of literacy. We are now doing a thorough investigation to pinpoint the root causes of the problems and provide state-of-the-art technology solutions to these challenges without jeopardising any existing regulations. Possibility of developing a model employing a number of inexpensive sensors and analytical instruments. Due to their high cost, these devices aren't available in all government-funded "Ayushman" Clinics. We are now working on a lightweight, low-cost, multi-data device that may be brought to outlying areas for healthcare needs. Finally, a strategy for transferring data long distances via a low-cost network, even from locations outside the reach of the GSM system. We are creating LPWAN (Low Power Wide Area Network), with an emphasis on the LoRa network, to allow for the long-distance transmission of sensor data (up to 20-25Km) without needing a GSM network. This network has already sent GPS and thermal data. A framework for analysing medical data and using predictive algorithms is required to foresee the effect of different diseases on human health.

Collecting Information: -

- True and Original Materials
- Three separate modules are being used in the creation of this framework.
- Female-centric Healthcare Information & Communication Network (FPDCP).
- In order to ensure the safety of female patients, this system will be constructed.

principal means of obtaining data are:

- The primary source of information will be interviews with rural women and college students from far-flung campuses.
- For this reason, the platform will include the medical and IoT sectors, with the majority of data coming from sensors designed for medical readings from patients.
- While we already have some preliminary data for use in developing the Framework for LPWAN in IOMT, we'd want to gather even more information from the rural areas of interest.
- Particular patients' data will be collected (with their permission) and used to best analyse medical data from sensors and make predictions.

Circumstantial Proof

- Since the framework interacts with the actual person, the data sets will come from trustworthy and established medical databases
- In this study, we will use sensor data sets from legitimate medical sources
- we will collect data from research centres and universities throughout the globe that are focusing on medical sensors.
- We have previously collected information from many reliable resources, such as trusted data centres like www.kaggle.com and well-known vendors like 'PHILIPS.'

Sampling:- Sampling Unit:

4 sensor data is being collected.

No of Sensors- I have taken 4 sensor data and will take 10 more sensor data.

1. Temperature (Human Body)
2. Blood Pressure.
3. Oxygen sensor and pulse sensor.
4. ECG sensor.

.

Size of Sample:

more than 1000 Source List:

We collected from sensor and also from medical data providers.

Analytical Tools:-

We will be using Python for creating analytical platform using data science algorithms. The intelligence tools used will be different libraries of python. The data will be

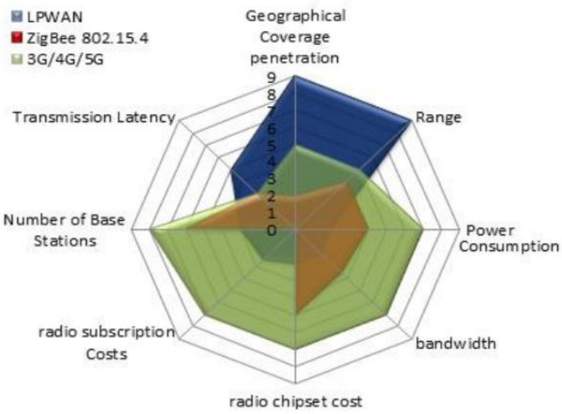
represented by using BI tool : Tableau.

The data will be stored on the AWS cloud using the things network.

The LPWAN will be using the Dragoon based LoRa Gateway kit and transmission methods.

PREVIOUS RESEARCH WORK

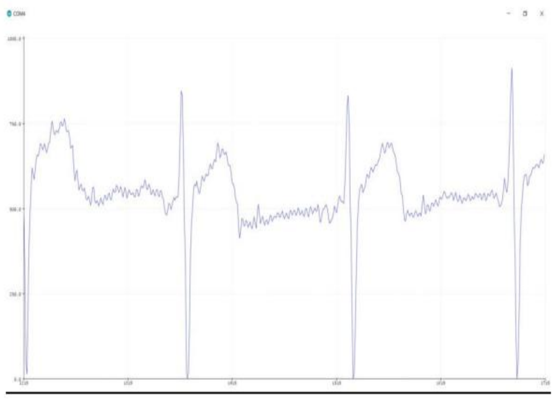
COMPARISON BETWEEN DIFFERENT NETWORKS



Requirements	Licensed Spectrum			Unlicensed Spectrum	
	LTE-M	NM-IoT	SigFox	LoRa	Others
Coverage	160 dB	164 dB	149 dB	157 dB	177 dB
Bandwidth	1MHz	180Khz	100Hz	125KHz	1MHz
Throughput	1 Mbps	250 Kbps	100 bps	290 bps-50 Kbps	624 Kbps
2 Way Data TX	Yes	Yes	No	Depends	Yes
Security	128 - 256 bits	128 - 256 bits	16 bit	32 bit	AES 128 bit
Scalability	High	High	Low	Medium	High
Mobility Support	Connected & idle Mode	Idle Mode	No	Yes	Yes
LBS Support	Requires GPS	Requires GPS	No	Yes	Requires GPS
Battery	10+ Years	10+ years	10+ years	10+ Years	10+ years
Availability In India	Yes	Yes	No	Yes	No
Cost factors	Costly	average	N/A	Low	N/A

MEDICAL DATA:

1.00E+00	9.00E-01	3.59E-01	5.15E-02	4.66E-02	1.27E-01	1.33E-01
1.00E+00	7.95E-01	3.75E-01	1.17E-01	0.00E+00	1.72E-01	2.84E-01
9.09E-01	7.91E-01	4.23E-01	1.87E-01	0.00E+00	7.84E-03	6.30E-02
1.00E+00	4.79E-01	5.68E-02	6.42E-02	8.13E-02	7.27E-02	5.56E-02
1.00E+00	8.67E-01	2.01E-01	9.93E-02	1.41E-01	1.21E-01	1.09E-01
9.49E-01	5.05E-01	4.18E-03	2.25E-02	5.95E-02	1.07E-01	1.10E-01
1.00E+00	4.88E-01	1.14E-01	0.00E+00	3.01E-02	6.50E-02	6.09E-02
1.00E+00	4.60E-01	1.22E-01	9.30E-03	1.26E-01	2.20E-01	2.67E-01
1.00E+00	7.55E-01	1.35E-01	0.00E+00	2.86E-01	3.31E-01	2.57E-01
1.00E+00	7.06E-01	3.23E-01	1.02E-01	1.37E-02	2.23E-01	2.86E-01
9.69E-01	6.56E-01	1.73E-01	0.00E+00	6.05E-02	1.91E-01	2.49E-01
1.00E+00	1.93E-01	2.32E-02	4.72E-02	2.74E-02	9.45E-02	1.15E-01
1.00E+00	9.16E-01	1.92E-01	1.49E-01	1.68E-01	2.31E-01	2.42E-01
9.26E-01	7.91E-01	4.59E-01	2.42E-01	1.43E-01	1.80E-01	1.91E-01
1.00E+00	6.45E-01	3.09E-01	7.63E-02	3.33E-02	2.36E-01	2.83E-01
9.69E-01	5.08E-01	1.32E-01	6.62E-02	6.75E-04	4.46E-02	5.54E-02
9.23E-01	6.71E-01	2.31E-01	5.01E-03	7.57E-02	6.90E-02	5.62E-02
9.81E-01	3.59E-01	6.03E-02	9.28E-03	9.28E-02	1.86E-01	2.01E-01



Hypothesis:-

H1- Cognitive Machine Learning Will Lead to More Comfort

H2- Openness and Security

References

[1]. Tevfik Yoldemir(ASSOCIATE EDITOR) (2020) Internet Of Things and women's health , Climacteric, 23:5, 423-425, DOI: 10.1080/13697137.2020.1811563

[2]. Prasad, R.; Kobayashi, H. Multi-methodology design: An experimental comparison. In Proceedings of the IEEE International Verilog HDL Conference, Santa Clara, CA, USA, 26–28 February 1996; pp. 45–49.

[3]. Mengel, S.A.; Adams, W.J.; Hagler, M.O. Using a hypertext instructional design methodology in engineering education. In Proceedings of the Frontiers in Education 1997 27th Annual Conference, Teaching and Learning in an Era of Change, Pittsburgh, PA, USA, 5–8 November 1997; pp. 648–652.

[4]. Eskelinen, H. Improving the productivity of complex electronic systems design by utilizing applied design methodologies. IEEE Aerosp. Electron. Syst. Mag. 2001, 16, 26–28.

[5]. Wang, F.; Hannafin, M.J. Design-based research and technology-enhanced learning environments.Educ. Technol. Res. Dev. 2005, 53, 5–23.

[6]. Saini, A.; Yammiyavar, P. Weak eyesight therapy: A case study in designing an application for mhealth systems. In Proceedings of the 2013 International Conference on Human Computer Interactions (ICHCI), Chennai, India, 23–24 August 2013; pp. 1–8.

[7]. Ahmad, M. Designing for the Internet of Things: A paradigm shift in reliability. In Proceedings of the 2015 IEEE 65th Electronic Components and Technology Conference (ECTC), San Diego, CA, USA, 26–29 May 2015; pp. 1758–1766.

[8]. Mainetti, L.; Patrono, L.; Vilei, A. Evolution of wireless sensor networks towards the Internet of Things: A survey. In Proceedings of the SoftCOM 2011, 19th International Conference on Software, Telecommunications and Computer Networks, Split, Croatia, 15–17 September 2011; pp. 1–6.

[9]. Khalil, N.; Abid, M.R.; Benhaddou, D.; Gerndt, M. Wireless sensors networks for Internet of Things. In Proceedings of the 2014 IEEE Ninth International Conference on Intelligent Sensors, Sensor Networks and Information Processing (ISSNIP), Singapore, 21–24 April 2014; pp. 1–6. 13

[10]. Rotariu, C.; Manta, V. Wireless system for remote monitoring of oxygen saturation and heart rate. In Proceedings of the 2012 Federated Conference on Computer Science and Information Systems (FedCSIS), Wroclaw, Poland, 9–12 September 2012; pp. 193–196.

[11]. Chung, W.-Y.; Lee, S.-C.; Toh, S.-H. WSN based mobile u-healthcare system with ECG, blood pressure measurement function. In Proceedings of the 2008 30th Annual International Conference of the IEEE

[12]. Tan, S.-L.; Garcia-Guzman, J.; Villa-Lopez, F. A wireless body area network for pervasive health monitoring within smart environments. In Proceedings of the 2012 IEEE International Conference on Consumer Electronics (ICCE-Berlin), Berlin, Germany, 3–5 September 2012; pp. 47–51.

[13] . Wannenburg, J.; Malekian, R. Body sensor network for mobile healthmonitoring, a diagnosis and anticipating system. IEEE Sens. J. 2015, 15, 6839–6852. [CrossRef]

[14]. Shchekotov, M. Indoor localization methods based onWi-Fi lateration and signal strength data collection. In Proceedings of the 2015 17th Conference of Open Innovations Association (FRUCT), Yaroslavl, Russia, 20–24 April 2015; pp. 186–191.

[15]. Youn, J.H.; Ali, H.; Sharif, H.; Deogun, J.; Uher, J.; Hinrichs, S.H. WLAN-based real-time asset tracking system in healthcare environments. In Proceedings of the Third IEEE International Conference on Wireless and Mobile Computing, Networking and Communications (WiMob 2007), White Plains, NY, USA, 8–10 October 2007; p. 71.

[16]. Chen,W.H.; Chang, H.H.; Lin, T.H.; Chen, L.K.; Hwang, S.J.; Yen, D.H.J.; Yuan, H.S.; Chu,W.C. Dynamic indoor localization based on active RFID for healthcare applications: A shape constraint approach. In Proceedings of the 2009 2nd International Conference on Biomedical Engineering and Informatics, Tianjin, China, 17–19 October 2009; pp. 1–5.

[17]. Engineering in Medicine and Biology Society, Vancouver, BC, Canada, 20–25 August 2008; pp. 1533–1536.