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Health Monitoring System In Emergency Using Iot

ChatlaVenkateswarlu,
Assistant professor
Electronic and Communication Engineering, Martin's engineering college, hyderabad.India

As technology has developed and sensors have be enminiaturized; there have been attempt stoemploy contemporary technology inavariety offi eldstoimprovethe qualityofhumanlife.One of the important area sof researchthat asbeenidentifiedistheinclusionof technologyinthe healthcare business. People who require healthcare services find the munreasonably expensive, especiall in developing countries.Asaresult, thiseffortaimstosolveacurrent healthcareconcerninsociety.The primary purpose of the projectwastodevelopare mote healthcare system. It's broken into thr eeparts.The firs tcomponententails using sensdetectapatient'svitals, the secondsendingdatatocloud storage,andthethirddeliveringtheobserveddataforremote iewing.Thedatamaybeseenremotely,allowingadoctoror guardian to monitor a patient's health state even while they arenotinthehospital.TheInternetofThings(IoT)has-been widely used to connect readily available medical resources and givepatientswithintelligent,dependable,andeffective healthcareservices.Healthmonitoringforactiveand supported livings oneoftheparadigms that may useIoT benefits to improve the patient's lifestyle.

KeyWords: PatientMonitoring, IoT, SmartDevice, Smart Health Monitoring, Medical Services.

1. INTRODUCTION

Aremotehealth monitoring systemisamedical system extensionthatenablesremotemonitoringofapatient's essentialphysiologicalstate.Detectionsystemswere previously largely foundinhospitalsandweredistinguished byhuge, sophisticatedcircuitrythatrequiredagreatdealof electricity. Continuous advances in semiconductor technology have resulted in sensors and microcontrollers that are smaller in size, operate faster, use less power, and are more cost-efficient. As aresult,remote monitoringof patients'criticallivesigns,particularlythoseoftheelderly, hasadvanced.Theremotehealthmonitoringsystemcanbe utilized in the following situations:

A. It is recognized that a patient has a medical problem involving an unsteady regulating body system. When a patient is given a new medicine, this is what happens.

B. Thepatientispronetoheartattacksorhashadoneinthe past.Thevitalsmaybecheckedtoforecastandalertyoutoany changes in your body's condition.

C. Situationinvolvingavitalbodilyorgan

D. Thecircumstanceleadstotheemergenceofapotentiallyfatalailment.Thisisforpersonswhoareoverretirementage and may have deteriorating health issues.

E. Athletesinthemiddleofaworkout.Todeterminewhich training regimens will yield the best outcomes.

Severalnewtechnologieshavelatelybeencreatedtoaddress theproblemofremotehealthmonitoring.Thesystemsuse wirelessdetectiontechnologytowirelesslytransmitsensor datatoaremoteserver.Somebusinesseshaveevenadopted a subscription-basedservicemodel.Thisisaconcernin developing countries since some people are unable to use

themduetothehighcost.Thereisalsotheissueofinternetaccess, which is required for some systems that require a real-timeremoteconnection.Internetpenetrationisstillan issue in developing countries.

Manyofthesystemswerefirstimplementedinwealthy nationswithwell-establishedinfrastructure.Inthevast majority of situations, the systems have been modified to function in poor nations. To address some of these issues, remotedetectionmustbeapproachedfromthebottomupto accommodatethefundamentalminimumrequirementsnow accessible in underdeveloped nations.

Thesedays'patientmonitoringframeworksareaccessiblein two structures:

1-Single-parameter monitoring system: This system is used to take a person's blood pressure, monitor their ECG, and check their SPO2 (blood oxygen level), among other things.

2-Multiparametermonitoringsystem:Thissystemis usedtomonitoravarietyofimportantphysiologicalindicatorsinpatientsbytransmittingbasicdatasuchasECG, breathrate,andbloodpressure.Amulti-parameter observation system plays asignificant rolein thefieldof medical devices for these reasons.

ExistingIoTSystem

Inahospital, eitherthenurseorthedoctormustphysically movefromonepatienttothenextforahealthcheck,making itdifficulttoconstantlymonitortheirconditions.Asaresult, unlessanurseordoctoranalysestheperson'shealthatthe moment,anymajorconcernscannotbeimmediately discovered. This might put a strain on doctors who are in chargeofabignumberofpatientsatthehospital.

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2. INTRODUCTION

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[2] R.VajubunnisaBegum1,andDr.K.Dharmarajan2"Smart HealthcareMonitoringSystemInIoT"2020,European Journal ofMolecular & Clinical Medicine ISSN2515-8260 Volume 7, Issue 4, 2020

[3] Richa,AnweshaDas,AjeetKumarKushwaha,Prof.Mini Sreejeth"AnIoTbasedHealthMonitoringSystemusing ArduinoUno"2021,InternationalJournalofEngineering Research&Technology(IJERT)http://www.ijert.orgISSN: 2278-0181

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[4] ShwetankDattatrayaMamdiwar1,AkshithR1,Zainab Shakruwala 1, Utkarsh Chadha 2, Kathiravan Srinivasan 3 and Chuan-Yu Chang 4,* "Recent Advances on IoT-AssistedWearable Sensor Systems for Healthcare Monitoring" 2021, Biosensors 2021, 11, 372

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[6] Anil Kadu, Mansi Gajare, Pritesh Chaudhari, Payal Deshmukh, Sameer Deshmukh, Manas Dani. "IoT Based Health Monitoring System" 2021, https://www.researchgate.net/publication/349807501

[7] Mohammad MonirujjamanKhan,1Safia Mehnaz,1Antu Shaha,1 Mohammed Nayem,1 and Sami Bourouis 2 "IoT- Based Smart Health Monitoring System for COVID-19 Patients" 2021, Hindawi Computational and Mathematical Methods inMedicineVolume2021,ArticleID 8591036, 11 pages https://doi.org/10.1155/2021/8591036

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Afewsimplequestionsandcomparingittotheexisting knowledgebase, resultinginanefficientExpertSystemwith proper data mining techniques.

3. LITERATUREREVIEW

Theliteraturereview, studiedsomeresearchpaperrelated toIoTinthehealthmonitoringsystem,andasummaryofthe research papers are given below:

NarasimhaRaoJastiMadhu (2010): The author researchedthe"IoTbasedRemotePatientHealthMonitoring System" and the conclusion is that The developed system modulescanberefinedandmanufacturedasasinglecircuit.The factthatallofthecircuitcomponentsutilizedintheremote health detection s System"2020,JournalofCriticalReviewsISSN-2394-5125 Vol 7, Issue 4, 2020.

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[1] ystem are readily available was alsodiscoveredduringprojectdesign.MicroElectro MechanicalSystems(MEMs)andmicrocontrollershave grownmoreinexpensive,smaller,andpower-efficient thankstoadvancementsintheintegratedcircuitindustry.As aresult,moreembeddedtechnologiesarebeingdevelopedandadoptedbyhealthcareprofessionals.Smartphone technologyhasalsoincorporatedtheseintegratedsystems. With rising internet penetrationthroughmobile phonesin mostemergingnations, theInternetofThings (IoT)willbe embracedataquickerrate.TheRemoteHealthCaresystem incorporates these ideas to create a system that improves people's quality of life.

[2] LIMSHENGKEONG(2017):Theauthorstudied"IoT-HealthcareMonitoringSystemWithCapabilityToDetect Ecg, Blood Pressure And Temperature" and the conclusion aregiventhat,Theaverageaccuracyforeachsensorin measuringthehealthparameteris99.21%fortemperature measurement,99.26%forpulseratemeasurement,99.17% forSystolicpressureand98.72%fordiastolicpressure.The measured data are transmitted to the IBM Blue mix Cloud platformwith1.53millisecondspersampleofdata.The DE1-SoCplatformusestheonboardRJ45porttoconnectto theInternet.Alocalwebpageisdevelopedtoallowtheuser to viewtheresultsfromthemeasurementandfinally performthediseaseprediction.TheIoTfunctionofthe proposedsystemcanfunctiononceitisconnectedto EthernetwithanInternetconnection.TheIoTframeworkontheInternetisdevelopedusingtheIBMBluemixCloud platformwithAPIandCloudsupportedbyIBM.Theresultsare storedincloudstorageaccordingtothetypeofhealth parameter.Thesepreviousparameterswillberemained insidethecloudandasareferencefordoctorsanduserstoknow the current health trend. The stored health parameters areavailabletodoctorsandusersthroughthewebpage developedonIBMBluemix.Thecommentfeaturefromthe doctorhasbeensuccessfullystoredinthecloudanddisplayed on the web page once patients choose to view it.

[3] Usha Rani et al (2017): These authors' research regarding the"IoT Patient Health Monitoring System"

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different essential indicators, followed by an evaluation at cloud,andthenawarningtothedoctororconcerned persons about the patient's health status. It keeps track of vitalindicatorsanddetectsanyirregularities.These irregularitiesinformmedicalpersonnel, reducingtheneed formanualmonitoring.Thedataissenttothecloudplatform using the MQTT connection. This communication protocol sendsthereadingsofcrucialpatients'vitalsensestoaweb interface, which then visually displays the data.

[4] Banka et al (2018): These authors research his work regardingthe“SmartHealthcareMonitoringusingIoT”and conclusionaregiventhat,exhibitedaprototypeforan autonomoussystemthatenablescontinuousmonitoringof multiple health indicators as well as the prediction of any disease or issue, sparing the patient the agony of repeated hospitalvisitsTheproposedmethodmight beutilizedin hospitalstocollectandstoremassivevolumesofdatainan online database. An application canalso be used to get the findingsfromamobiledevice.Thetechnologymightbe enhancedfurtherbyincludingartificialintelligencecomponents to assist clinicians and patients. Datamining maybeusedtoseekregularpatternsandsystematicrelationshipsindisease, includingthemedicalhistoryof many patients' parameters and their associated outcomes. Forexample, ifapatient’shealthparameterschangein the samewayasthoseofapreviouspatientinthedatabase,the consequencesmightbepredicted.Ifsimilarpatternsare detected again, it will be simpler for doctors and medical researchers to devise a remedy.

[5] Sathyaetal(2018): Theseauthorsresearchtheirwork regardingthe“Internetofthings(IoT)basedhealth monitoringsystemandchallenges”andconclusionaregiven that, The importance and advantages of incorporating IoT intoremotehealthmonitoringsystems.TheInternetof Things-enabledlittlesensors willhaveabigimpactonevery patient's life, allowing them to reduce their fear of danger evenwhiletheyareawayfromhomeandtheirdoctor. Sensorydatamightbegatheredathomeorwork.The challengesofsicknesssensing, analytics, andpredictionare alsoexplored,aswellashowtheymightbesolvedtoallow a seamless integration into the medical business.

[6] Senthamilarasi et al (2018): These authors research hisworkregardingthe“ASmartPatientHealthMonitoring SystemUsingIoT”andconclusionaregiventhat,The suggestedpatienthealthmonitoringsystemcanbe extremely useful in an emergency since it can be tracked, recorded,andsavedasadatabasedaily.TheIoTgadget mightbelinkedwithcloudcomputinginthefuture,allowingthe database to be shared across all hospitals for intense care and treatment.

[7] Rumanetal(2020): Theseauthorsresearchhisworks regardingthe“IoTBasedEmergencyHealthMonitoring System”andconclusionaregiventhat,Theaccuracy,number ofsensors,andcost-utilityoftheIoT-basedEmergency

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[6] Patil et al (2020): These authors research his works regardingthe“IoTbasedPatientHealthMonitoringSystem” andconclusionaregiventhat,Thisprojectpresentsasimple low-costhealthmonitoringschemethattakesintoconsiderationthegreatpracticalvalueofanIoT-based live monitoringsystemforpatientsatriskofheartattack, unequalaccidents,andemergencycases.Becauseofits multitasking capabilities and low power consumption, the ATmega328Pischosenforthisapplication.Thissystemmay also be readily placed in all ambulances, and the database cancontainalargeamountofdata.Furthermore,this informationisquitevaluable.Wealsolearnedsoftware embeddedCforsimulation,whichpresentedsomechallenges.Itmakesthedoctor'sjobeasierwhilealso providing reliable findings.

[7] Valsalanetal(2020): Theseauthorsresearchhisworks regardingthe“IoTBasedHealthMonitoringSystem”and conclusionaregiventhat,TheInternetofThingsisnow consideredafeasiblesolutionforanydistantvaluetracking, notablyintherealmofhealthmonitoring.Itpermitsthesafe storingofindividualhealthparameterdatainthecloud,the decreaseofhospitalvisitsforroutinetests,and,most crucially, disease monitoring and diagnosis by any doctor fromanywhere.Inthisarticle,anIoT-basedhealth monitoringsystemwasdeveloped.Bodytemperature,heart rate, room humidity, and temperature were all monitored usingsensorsandshownonanLCD.Thesesensordataare thenwirelesslysenttoamedicalserver.Thesedataarethen senttoapersonalsmartphoneequippedwithanauthorized IoTplatform.

Josephine Hope Halima (2020): Theauthor studied hisworksregarding"AnIoTframeworkforhealthcare monitoringsystems"andconclusionsaregiventhat,For suchfolks,theInternetofThingsisalifeline.Significant effortsareundertakeninthisstudytosynchronizedatafrom

healthmonitoringsystemareamongthesystem'sshortcomings.Analyzinganddeterminingapatient'shealth statebasedononlythreecharacteristicsisextremely difficult.Asaresult,alargernumberofsensorsisrequired,and ahigh-qualitysensorispricey.Theprecisionofthe sensors,ontheotherhand,isacriticalaspectofthis endeavor.Variedsensorsandtechniquesformeasuring healthmetricsprovidedifferentfindings,andasaresult,the parameters'accuracyvaries.However,thesystem'slackof accuracymightbemitigatedbyemployingmorepreciseand high-qualitysensors.It ispossibletoemployavariety of proceduresandmakeappropriatecomparisons,withtheone that produces the most accurate result being used for the product.

[8] sensorstothecloud,whichcanthenbeaccessedviaamobile application.Theinformationgatheredisthoroughly examined,andpatientsfromvariousgeographicalplacesare diagnosedasaresult.AllofthedetailsabouttheIoT framework are discussed in detail.

[9] Begumetal(2020): Theseauthorsstudiedhis researchworkregardingthe"SmartHealthcareMonitoring SystemInIoT"andconclusionsaregiventhat,Patientswho areuncomfortable withfrequenthealthcheck-upsandalong stayinclinicsmightbenefitfromremotecapabilities,which reducescosts.Italsoallowspatientstofollowenvironmental improvementfromtheconvenienceoftheirownhomes.The onlineappallowsforthecollectionandretrievalofpatient datafromanylocationandatanytime.Theentireprototype frameworkmightbetransformedintoaself-careservicefor clinicalmonitoringofthepatient'sbodytemperature, posture,ECG,heartrate,andenvironmentalparameters.The following featuresmayalso bevisibleontheLCDscreenin the slavecircuit,whichispositionednearthepatient.Physicians can viewthe findings on the webpage of their own server/mobile device.

[10] AnweshaDasetal(2021): Theseauthorsstudiedhis researchworkregardingthe"AnIoTbasedHealth MonitoringSystemusingArduinoUno"andconclusionsare giventhat,Becausethesuggestedpatienthealthmonitoring systemmaybeobserveddaily,recorded,andsavedasa database, it canbeutilized extensively in emergencies. IoT devicesmaybecombinedwithcomputercomputersinthe future,allowingthedatabasetobesharedacross intensive careandtreatmentfacilities.Thishealthmonitoringisalsovery important in this epidemic; we may avoid visiting the hospital frequently and merely check ourselves at home.

[11] Mamdiwar et al (2021): These authors research his works regarding the "Recent Advances on IoT- AssistedWearable Sensor Systems for Healthcare Monitoring"andasummaryoftheresearchisgiventhat,To integrateIoTinhealthcare, sensors,communication,cloud services, and data processing and analysis are all required layers of the architecture. A thorough examination of data gathering, data transport, data processing, and computing paradigmsfollows.Datacollectionandtransmissionare handledbythepatient'sphysicallayer,whichisgenerallya wearabledevice,whereasstorage,calculation,andprocessingarehandledbyavirtualsystemthatisextremelyeasytoaccess.Itexplain sthedifferentcomputingapproaches, including parallel, cluster, grid, edge, fog, and cloudcomputing,andhowtheyfunction.Thereportdiscusses allofthedifferenttechnologiesthathavebeen utilizedtocommunicategathereddatatotheserverand medical staff. ZigBee, Wi-Fi, Bluetooth, and LoRaWAN are amongthetechnologiesused.Themostprevalentshort-and long-rangecommunication technologies utilized inan IoT-basedhealthcaresystemarelistedbelow.Thesetechnologieshavebeenthoroughlyreviewedintermsofdata transmission speed, communication range, power consumption,networkingtypes,andthemanydevicesthat maybeusedtoimplementthistechnology.Thetechnologiesare comparedin termsofthe parametersdescribedabove, as wellasfrequencybandwidth,payload,andsecurity.Itoffersus abetterideaofwhatkindoftechnologytoutilizebased onthesystem.Interoperabilityisexplored,aswellasthe

3- CONCLUSION

After studying the above literature review, there are some conclusionsfoundthatThepatientwirelesshealthmonitoringreducesthetimeconsumptioningathering the patient'sdata,moreaccuratelythanthemanualsystem.The transmitteddataisstoredandanalyzedwiththeproper analytictool,andbasedonthereport, thepredictionofthe progressofdiseasesisdone.Inthefuture,moresensorscan beattachedtothePrototypeofthehealthmonitoringsystem devicetoenhancethecapabilityofmonitoringthepatients withdifferentprospectivefromdifferentlocationswithease, efficiency, and economical.

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