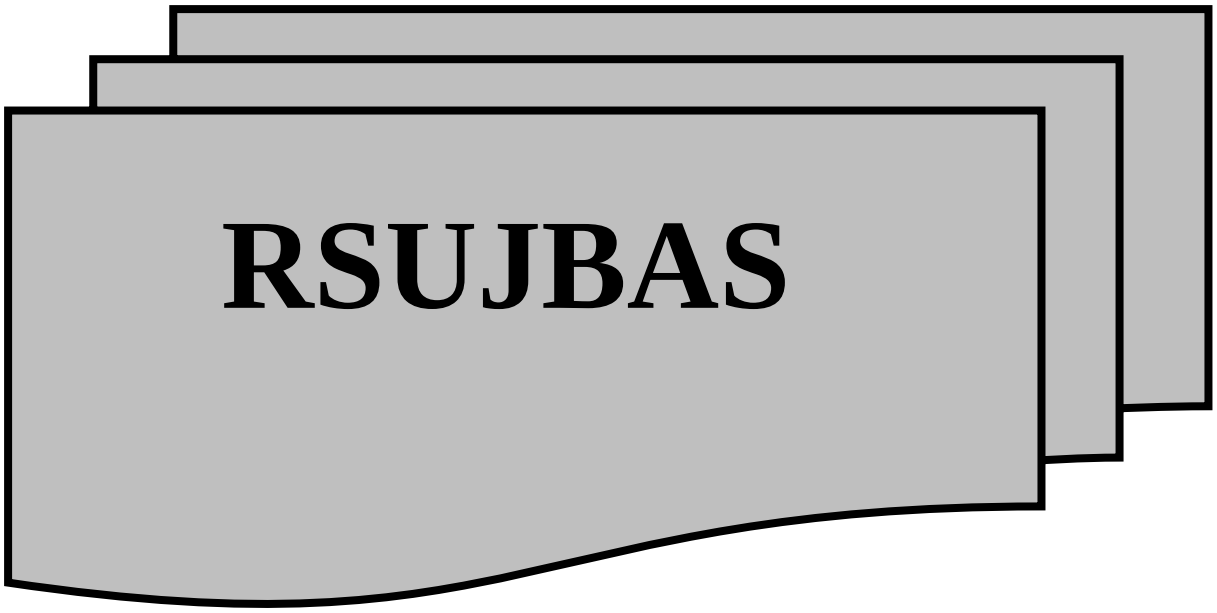
RSU JOURNAL OF BIOLOGY

AND

APPLIED SCIENCES

ISSN: 2811 – 1451



ABOUT US

Rivers State University Journal of Biology and Applied Science (RSUJBAS) publications is a quarterly, open access, international journal for all academic research in science discipline. Microbiology, botany, zoology, environmental biology, chemistry, physics, mathematics, computer science, biochemistry medical laboratory sciences and other applied science related areas. RSUJBAS is a platform set for elites to influence, contribute and communicate to the global environment through their various academic researches. We synergistically engage our noble effort to contribute to the knowledge development, discoveries and innovations in all fields of study. In RSUJBAS we publish research papers on current academic issues with standard scientific reviews. RSUJBAS publishes original research articles, review articles, case studies, short communications, survey report, comparative studies and many more.

Aims and Scope

Rivers state University Journal of Biology and Applied Sciences aims to publish high quality papers that communicate fundamentals and contemporary discoveries both theoretical and practical. Most importantly RSUJBAS seeks to establish a platform for communicating emerging trends in various discipline such as Microbiology, Botany, Zoology, Environmental Biology, Chemistry, physics, Mathematics, Computer Sciences, Biochemistry, Medical Laboratory, Sciences, and other applied sciences related areas.

Description:

- Area of concentration: All science academic disciplines
- Frequency of publishing: Quarterly
- Mode of publishing: both online and print publication
- Language of publication: English
- Double blinded Review Process
- Zero Level Plagiarism Tolerance

Why Publish with us

Low Article Processing Charge (ACP) to promote the research work
Easy and Rapid review process
Instant publication upon acceptance
Dedicated editorial and review team for fast review process
RSUJBAS provides hard copies of publication every quarterly

EDITORIAL BOARD

All Correspondence to
Prof Sam Wenedu (Editor -in -Chief)
Department of Microbiology, Rivers State University
Edictor.ibasya@yoo.com

Or

OLUCHI DICKSON
Publication Manager
Dicksonoluchi87@gmail.com

CONSULTING EDITORS

GUIDELINE FOR MANUSCRIPTS

Manuscripts should be typewritten on an A4sheet having B1.5=line spacing throughout the text. The margins should be 2B54cm (1 inch) in all sides and page number should be consecutively on the bottom of the page. The manuscript should be written in Times New Romans using '12' font size.

For original research paper, the manuscript should be arranged in the following order: Tittle page, Abstract, Keywords Introduction, Materials and Methods Results, Discussion, Acknowledgement, References, Tables with legends and supplementary materials

The tittle page should contain the title, the name(s) of the author(s), the name(s) and address (es) of the instruction(s) where the work was carried out, including a valid e-mail address from the corresponding author along with telephone numbers. The title of the manuscript should be specific and concise but sufficiently informative.

The Abstract should not exceed 250 words and it should contain brief summary of the findings including brief introduction, methodology, results, and conclusions,

The keywords should have a minimum of five and maximum of seven words.

The introduction should provide a clear statement of the problem and indicates aim of the study citing relevant literature to support background statements.

The Materials and Method should include the methods and methodology of the research.

The results should be presented in the form of tables of figures. It should be presented with clarity and precision. Statements used to present results should be written in the past tense. Detailed interpretation of data should not be included in the results but should be put into the Discussion section.

The Discussion should interpret the results clearly and concisely, and should integrate the research findings of this and past studies on the topic. Highlight the significant/unique findings of the research under conclusion.

The acknowledgment of people, grants or funds should be brief.

TABLE OF CONTENTS

LIST OF CONTRIBUTORS

Naluba Nwiekpigi Goddy
Department of Geography and Environmental Studies
Faculty of Social Sciences
Ignatius Ajuru University of Education
P.M.B 5047, Rumuolumeni, Port Harcourt.
Email: naluba.goddy@iaue.edu.ng

Ephraim Esuu-Ikup Amon
Department of Geography and Environmental Studies
Faculty of Social Sciences
Ignatius Ajuru University of Education
P.M.B 5047, Rumuolumeni, Port Harcourt.

Kpeno Amon Ephraim
Department of Adult Education and Community Development
Faculty of Education
Ignatius Ajuru University of Education
P.M.B 5047, Rumuolumeni, Port Harcourt.
Email: kpenoephraim@gmail.com

Ugwoke, F. N
Department of Computer Science,
Michael Okpara University of Agriculture, Umudike
ndidi.ugwoke@gmail.com

Etuk, E.A
Department of Computer Science,
Michael Okpara University of Agriculture, Umudike
etuk.enefiok@mouau.edu.ng

Iroegbu C.
Department of Electrical and Electronics Engineering,
Michael Okpara University of Agriculture, Umudike
iroegbu.chibuisi@mouau.edu.ng

Nwabueze, S.I.
Department of Computer Science,
Renaissance University,
Ugbawka, Enugu.

Mc-Kelly Tamunotena Pepple
Federal Polytechnic of Oil and Gas Bonny,
Department of Electrical/Electronic Engineering Technology
mckelly2014@gmail.com, *07030335027*

Efiyeseimokumo Sample Ikeremo
University of Africa, Toru-Orua,
Faculty of Basic and Applied Science,
Department of Computer Science
samplefiye@gmail.com

Asogwa S.C.,
Department of Computer Sc.,
Michael Okpara University of Agriculture,
Umudike, Nigeria
Asogwa.samuel@mouau.edu.ng

Okorie Nnanna Kalu
Department of Computer Sc.,
Michael Okpara University of Agriculture,
Umudike, Nigeria

COVID-19 INFECTED PATIENTS TRACKING SYSTEM USING MADUINO

ASOGWA S.C
Department of Computer Sc. Michael Okpara University of Agriculture, Umudike, Nigeria
Asogwa.samuel@mouau.edu.ng
&
ETUK E. A.
Department of Computer Sc. Michael Okpara University of Agriculture, Umudike, Nigeria
&
UGWOKE F. N.
Department of Computer Sc. Michael Okpara University of Agriculture, Umudike, Nigeria
&
OKORIE NNANNA KALU
Department of Computer Sc. Michael Okpara University of Agriculture, Umudike, Nigeria

ABSTRACT

Tracking is a series of steps taken to monitor the location of objects under observation. Tracking is very essential in epidemiology because if an infectious disease is not monitored there is likelihood that such disease may lead to massive loss of lives. When a diseased person suffering from covid-19, monkey pox, corona virus, Ebola and likes escapes from quarantine custody the people are at risk of infection hence the need for a well-organized system of mitigating against such. In this paper, we have developed a reliable tracking system for monitoring and tracking the location of COVID-19 patient for the purpose of making sure that such escapees do not spread the disease to the public. This system uses MADUINO chip embedded on the corona virus patients to track his where-about in order to control the spread of the disease. The maduino chip is driven by software that reports to the system the location of such patients in real-time. The location of such patient is recorded in a database from where government disease control agencies can access and use for effective disease management. It is hoped that if adopted, this system will contribute to the effective monitoring and management of infectious diseases.

Keywords: ***Covid-19, Patients, Maduino Chip, Gprs Tracking***

INTRODUCTION

A tracker is a navigation device normally on a vehicle, asset, person or animal that uses the Global Positioning System (GPS) to determine its movement and determine its geographic position to determine its location. (dbpedia, 2022) Locations are stored in the tracking unit or transmitted to an Internet-connected device using the cellular network (GSM/GPRS/CDMA/LTE or SMS), radio, or satellite modem embedded in the unit or Wireless Fidelity (WiFi).Coronavirus disease (COVID-19) is a contagious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The first known case was

identified on a vendor in a life animal market in Wuhan China in December 2019. (Guardian, 2022) The disease has since spread worldwide, leading to an ongoing pandemic. Symptoms of COVID-19 include fever, cough, headache, fatigue, breathing difficulties, and loss of smell and taste. Transmission of COVID-19 occurs when people are exposed to virus-containing respiratory droplets and airborne particles exhaled by an infected person. Using a GPRS tacking system to locate an infected COVID-19 patient goes a long way to monitor when an infected patient is up to endangering other uninfected people by alerting the admin when such situation is in play. A disease tracking system is basically a practice in the field of epidemiology which involves monitoring of a disease, especially an epidemic in order to establish patterns of progression. For this study we are going to be considering the most recent epidemic of the 21st century; the COVID-19(Corona virus Disease) pandemic.

The primary and key role of this disease tracking system is to predict, observe and minimize the harm caused by the outbreak, epidemic and pandemic situation. It also plays the role of increasing knowledge about relevant factors which contribute to those circumstances (wiki, 2022). It is made particularly successful critically by the practice of disease case reporting. Reporting of disease outbreak incidents can be done by gathering cases from hospitals which could then now be collated and made public. This is a way to quickly contain hot spots for the particular disease we are tracking. If a COVID – 19 patients escapes from the hospital the patient might cause a lot of problem or contaminate many person before the patient is being captured. The existing system does not have the capacity to track any escaped COVID – 19 patient which makes it inappropriate of respective cases in Nigeria.

Review of Related Literature Review

Disease-specific surveillance consists of the surveillance of a selection of diseases, syndromes, and risk exposures considered as public health threats for the population of interest (Ce´dric et al., 2016). The COVID-19 disease is caused by severe acute respiratory syndrome–coronavirus 2 (SARS-CoV-2) which has rapidly spread with increased fatalities across the world leading to a worldwide pandemic. In response to the rapidly growing number of cases and the danger of overburdening health systems, many countries have resulted in lockdowns to slow the spread of the novel coronavirus. Christophe Fraser of the uk scientific advisor to UK government posits that Digital contact tracing systems can help reduce the incidence of spread and allow people to return to their normal life.
Like previous similar outbreaks such as Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS), manual contact tracing and follow-up control measures such as quarantine and isolation were crucially important and successful during these outbreaks. Centers for Disease Control and Prevention (CDC, 2020),

Hence, we are proposing a technology-based method to fill the gap in the identification of contacts, especially if case detection is aggressive. Public health authorities and governments have responded by building digital contact tracing mobile apps like the ones initiated in Singapore, South Korea, and China to keep track of meetings between individuals which allow self-isolation instructions to be sent automatically to every one when a newly diagnosed patient has interacted with them while infectious with the SARS-CoV-2 virus.

The challenge we have in Nigeria is that there is not a very reliable national database for contact tracing of infectious disease. (Shu-Wan et al., 2020) rightly stated that integrated contact tracing system may not be feasible for countries without an existed relational database from various sources such as case notification, laboratory, and contact tracing.

Apple and Google in a joint effort to assist in this regard, announced a new technology for third-party apps on iOS and Android devices to support public health authorities around the world in developing digital contact tracing apps. However, recent studies show that these apps are not being used by enough of the population in countries including India, Norway, Singapore, and Iceland. In a survey from the Washington Post and the University of Maryland, USA, respondents were split evenly (50–50%) Technical, privacy and security problems have hampered the apps and their impact on the COVID-19 pandemic remain uncertain. Some states such as Lagos set up telemedicine to cater for health issues not related to covid 19 in other not to neglect giving attention to other health matters. (Adediran, 2020). In a related development health workers treating covid-19 patients at mainland hospital lamented on the lack of Personal Protective Equipment such as the N95 respirator mask. This indicates the need to make sure that the disease does not spread (lara, 2020). The European commission published guidance on Apps supporting the fight against COVID-19 in relation to data protection and suggested that such should be voluntary for users who do not install it.

METHODOLOGY AND MATERIALS

The programming languages used to implement this project are PHP, JavaScript, HTML language and MySQL (for database), a cell phone, Arduino 1.8.15 notepad and Maduino (a notepad for designing or communication with Arduino boards or hardware devices), Maduino Zero Board (a hardware device that communicates/or response to peoples request)

The approach involve the GPRS tracking device, hardware device and other necessary tools needed for tracking a COVID – 19 patient. We used microcontroller (Maduino Zero) and an Arduino notepad containing necessary of codes. Cell phone with the GPRS location link, and in order to get the link requires steps like: at least a 2G SIM card and the SIM number

i. Slot the SIM card first in a phone to be sure that the SIM can access a network
ii. Try sending messages with the SIM, and if the SIM is responsive
iii. Remove the SIM and insert it into the SIM port in the Maduino Zero.
iv. Send **Location** with a smart phone to the number of the 2G SIM card inserted in Maduino Zero
v. Wait for a while a link will be sent to your smart phone
vi. When clicked on the link will show you the location of the person with the covid-19 infection.

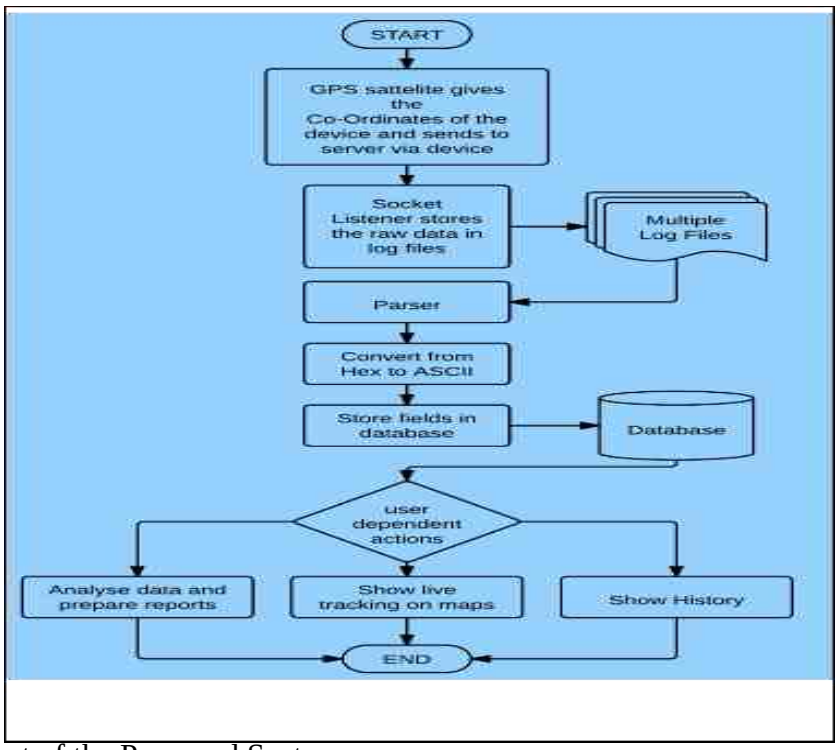


Fig. 1. Flow chart of the Proposed System

(A) Use Case Diagram and Class Diagram

This is a general-purpose, developmental, modeling language in the field of software engineering that is intended to provide a standard way to visualize the design of a system.

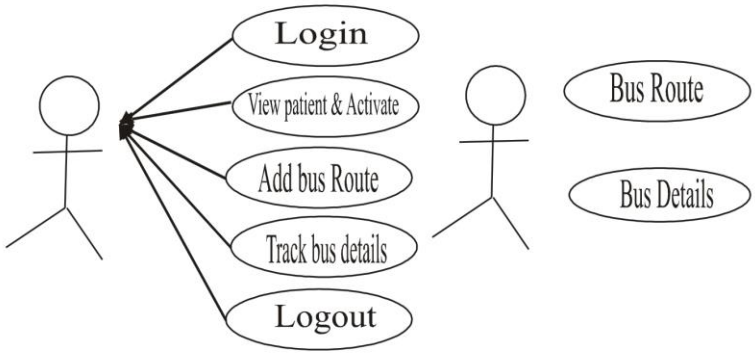


Fig. 2. The Use Case Diagrams

A use case diagram can identify different types of users of a system. According to the figure below. Admin can perform the following functions:

(a) Login: Admin needs to perform all administrative works from admin panel
(b) Delete: Admin can delete any data that is no more in use
(c) Edit: Admin can edit the data to suite the present requirement or condition
(d) Publish: Admin will publish the location of the patient that is been tracked

BUS ROUTE

The bus or taxi is the most likely means by which the patient can escape to another location. It is therefore important to monitor the routes vehicles apply though a map. The tracking device can be installed in the bus to aid the system in tracking the patient escape route. This can help

the authorities to know the likely route the patients follow during escape. The app can also be installed on the mobile phone of the drivers who will help in noting the presence of the patient on the bus to enable the driver alert the health authorities.

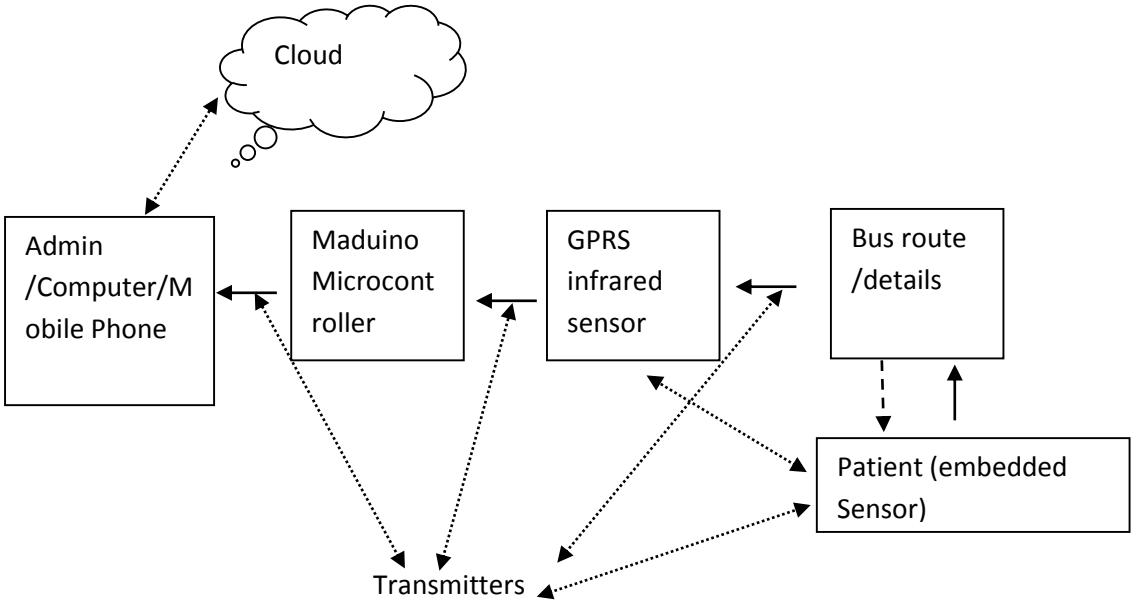


Fig. 3. Block Diagram of the Complete System

This program will be controlled by the admin who will send a signal to locate the patient through the GPRS sensor that will work with a micro controller. The microcontroller will interface with the Bus Route in other to specifically locate the patient.

INPUT FORM DESIGN

The input form design is all about the basically concerned on how data are being fed into the system. This refers to the files that could be updated, the input data, how the inputs get into the system and the medium in which they get in. For this system, the input media are keyboard, mouse and scanner. The input design includes; Registration: This is done by the only the admin and Insertion of patients record (this is and can be done by the admin)

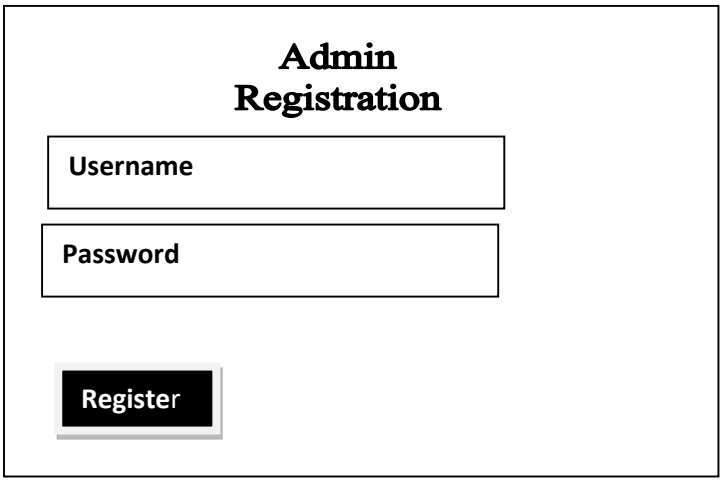


Fig. 4. Admin Registration Page

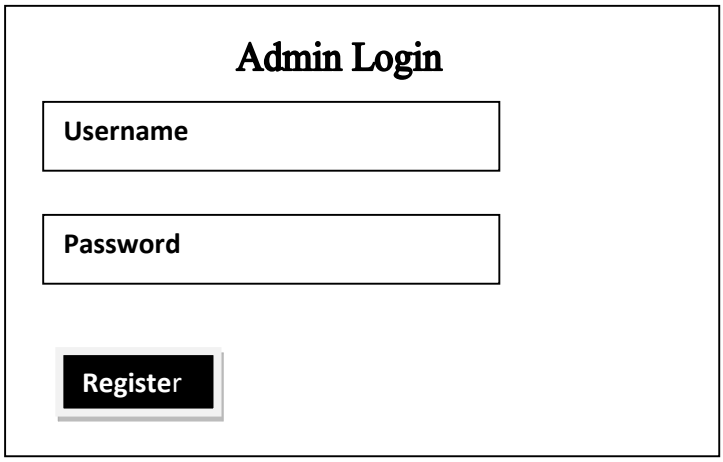


Fig 5: Admin Login

Database Structure

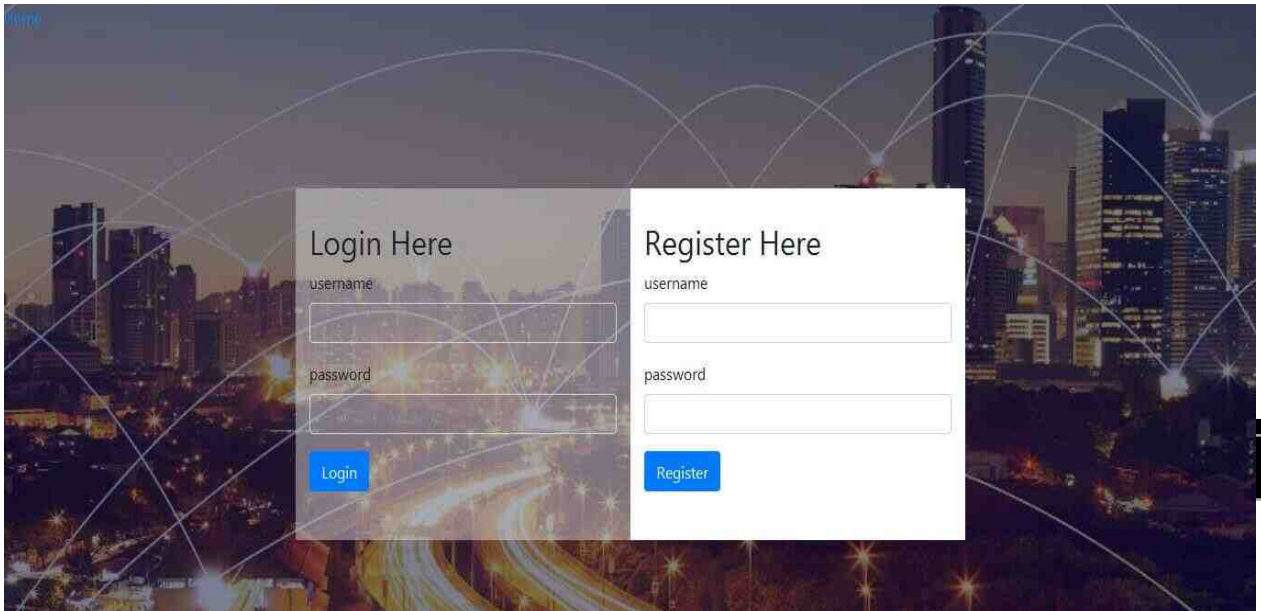
The database "project database" is created with MYSQL and it consist of several tables holding different data items

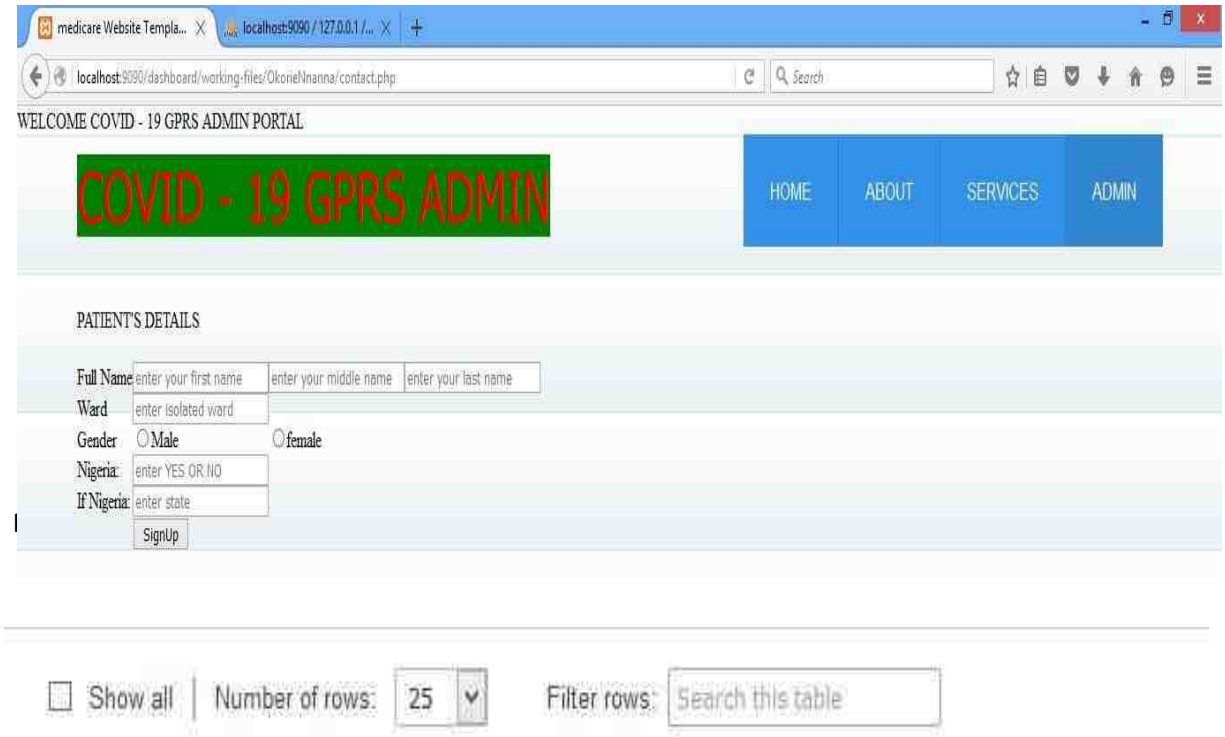
Table 1: Admin Login Table

S/N	Field	Data type	Width	Foreign key
1	**Name**	VARCHAR	30	YES
2	**password**	VARCHAR	12	NO

Table 2: Patients Information Table

S/N	Field	Data type	Width	Foreign key
1	**patients_first_name**	VARCHAR	15	NO
2	**patients_middle_name**	VARCHAR	15	NO
3	**patients_last_name**	VARCHAR	15	NO
4	**Ward**	VARCHAR	15	NO
5	**Gender**	VARCHAR	15	NO
6	**Country**	VARCHAR	15	NO
7	**State**	VARCHAR	15	NO





Show all | Number of rows: 25 | Filter rows: Search this table

Options

pfname	pmname	plname	ward	gender	country	state
Onyedikachu	Azueke	Madu	B12	Male	YES	Enugu
Kings	Anukam	Ojiekpe	C13	Male	Ghana	
Light	Charli	Light	C13	Male	Benin	
Odika	Odike	Luke	B12	Male	Yes	Lagos
Precillia	Onyeka	Kate	C56	Female	YES	Edo
Nneka	Kate	Oge	C56	Female	YES	Kano
Voloulo	Right	Vade	B12	Male	CAMERONE	
Chukas	Kings	Chukas	B12	Male	YES	Enugu

Fig. 9. Patient's record

VI. Results, Discussion and Conclusion

We have been able to achieve our objective of building a covid-19 patient tracking system using maduino that uses GPRS to locate a patient with covid-19. The patient is implanted with the chip on successful diagnosis of being positive to the disease. If the person escapes the quarantine center this device communicates with the system to locate the patients where about. In doing this the system contributes to lessening the spread of the disease. We believe that introducing the COVID-19 infected patients tracking system using maduino will help minimize the unathorized movement of infected patients by tracking and reporting every of their movements in real-time. We therefore recommend the followings:

A. The Federal government of Nigeria Should introduce the GPRS enabled COVID – 19 tracking system for infected patients. They should plant a GPRS chip in an infected patient to monitor his or her movement.

B. They should train people to handle the GPRS enable system and also call – up or organized a team to be in charge of the system.
C. The Nigerian Government should build a COVID – 19 tracking unit in all the thirty six (36) states in Nigeria to enhance quick team respond.

REFERENCE

Adediran I. 2020. Lagos Begins Telemedicine for Coronavirus-Unrelated Health Issues.https://www.premiumtimesng.com/regional/ssouth-west/389205-lagos-begins-telemedicine-for-coronavirus-unrelated-health-issues.html

Adejoro L. Punch Newspapers; 2020. Shortage of PPE, N95 Masks Exposes us to Infection Risks—Lagos Isolation Center Workers.https://punchng.com/shortage-of-ppe-n95-masks-exposes-us-to-infection-risks-lagos-isolation-centre-workers

(Alexandra G, 2020) " Privacy-preserving contact tracing apps to combat COVID-19" retrieved from https://www.europarl.europa.eu/doceo/document/E-9-2020-002463_EN.html on 26/8/2020

Ce´dric et al "Traditional and syndromic surveillance of infectious disease and pathogens" International jornal of infectious disease. Retrieved from: https://www.ijidonline.com/article/S1201-9712(16)31038-4/fulltext on 12/7/2022

Centers for Disease Control and Prevention. About variants of the virus that causes COVID-19. (2021). Retieved from: https://covid19.ncdc.gov.ng/ 17/6/2022

(Christophe F. 2020) "tracing Apps can save lives" retrieved from: https://www.ox.ac.uk/news/2020-09-03-new-research-shows-tracing-apps-can-save-lives-all-levels-uptake 20/11/2020

(Dbpedia,2022) "About gprs tracking unit" retried from : https://dbpedia.org/page/GPS_tracking_unit on 12/7/2022

Eylenbosch WJ, Noah ND. Historical aspects. In: Eylenbosch WJ, Noah ND (eds.) Surveillance in Health and Disease. Oxford, UK: Oxford University Press, 1988: 3–8.

(Guardian, 2021) **"**First known Covid case was Wuhan market vendor, says scientist" retrieved from: https://www.theguardian.com/world/2021/nov/19/first-covid-patient-in-wuhan-was-at-animal-market-study-finds12/9/2022

Hartgerink MJ. Health surveillance and planning for health care in the Netherlands. Int JEpidemiol 1976;5:87–91.

Riley S et al., "Transmission dynamics of the etiological agent of SARS in Hong Kong: impact of public health interventions." Science. 2003.

(Shu-Wan et al., 2020) "Contact tracing with digital assistance in Taiwan's COVID-19 outbreak response" international journal of disease control. journal homepage: www.elsevier.com/locate/ijid.Retrieved from: https://www.ijidonline.com/action/showPdf?pii=S1201-9712%2820%2932200-1

(Wikipedia, 2021) "disease surveillance" retrieved from: https://en.wikipedia.org/wiki/Disease_surveillance on 2/5/2022