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Abstract. Covid-19 is the destructive world’s most recent pandemic that is experienced in every part of the world. This deadly virus affects different people in different ways. Most infected people will develop mild to moderate illness and recover without hospitalisation. Covid-19 most common symptoms include fever, dry and tiredness. It is against this background that in Namibian health environment the country uses a manual system to record public member’s demographic information when visiting public places which do not allow tracing and monitoring of every public member who visited the 14 regions in the country. Therefore, the present study developed a National COVID-19 health contact tracing and monitoring system which will allow every public member who visits an enclosed public place by capturing their demographic information as well as the date and time the facility was visited. The system replaces the paper-based method of recording the information of people visiting public places with an entrance that allows the coming in and out of people. The system will also allow for real-time monitoring of temperature changes of individuals.

Keywords: National COVID-19, Health Contact Tracing System, Health Monitoring System.

1 Introduction

Monitoring and evaluation has become the buzz word in business and government sector in today’s world. Similar studies such as of [1] discuss the contribution of monitoring and evaluation as a way of promoting good governance through the implication of three perspectives: Monitoring and evaluation of accountability, management decisions, and organizational learning. This study discovered that the input of these three perspectives towards good governance has not yet statistically been achieved. Henceforth, Covid-19 as the world’s most recent pandemic that has been encountered in every nation of the world and a component of monitoring is needed for institution and business decision making. The tracing and monitoring tool of Covid 19 would assist in bringing the world of technology, business strategy and e-governance together. The pandemic has been destroying many of the world’s economies and causing death to many in the society. As such, this is not an exceptional case for Namibia. In light of the challenges caused by this pandemic, this study developed a tracing and monitoring system that could trace and capture all the demographic details for public members visiting public places and businesses with entrance and exit points. On the foregoing, the system will allow Namibia’s Ministry of Health and Social Services to easily trace all the public members who visited any public place anywhere and anytime without the social workers having to physically visit public places where the members who would have been diagnosed with the case of Covid-19 would have visited specific business and other public places. The system will capture demographic data of every customer or public member who visit an enclosed public place or business facility as well as the date and time the facility was visited. This approach is environmental friendly and sustainable as it is not paper based and incorporate technology in the tracing and monitoring system. The system replaces the paper-based method of recording the information of people visiting public places or business with an entrance that permits the coming in and out of people. The system will also allow for real-time monitoring of temperature changes of individuals.
changes of individuals. Moving into a new era of healthcare, new tools and devices need to be developed to extend and improve health services such as remote patient monitoring and risk prevention. In this concept, Internet of Things (IoT) and Cloud Computing present great advantages by providing remote and efficient services [2]. In India, many patients are dying because of heart attacks and the reason behind some of the deaths is that they are not getting timely and proper help. To give them timely and proper help first there is a need to continuously monitor the patients’ health [2]. The fixed monitoring system can be used only when the patient is on the bed and this system is only available in hospitals. Additionally this system is helpful in business decision making as consumer behavior and perception towards their decision on what product they may likely purchase as a result of ill health will be readily available. The system has also been developed for home use by patients that are not in a critical condition but need to be constantly or periodically monitored by a clinician or family member. In any critical condition the SMS is sent to the doctor or any family member.

2 Problem Statement

In the Namibian health domain, there is the challenge of public members visiting public places and their demographic information is captured manually which is yet another risk in the spreading of Covid-19. This is because the public members visiting any facility across the 14 regions of the country use one pen that is availed at each facility to write their details and as such this might put public members at risk of contracting Covid-19. This study developed a monitoring and tracing surveillance system that can capture all the details of every public member visiting any public place that has entrance and exit points country wide. Public health surveillance system are important as they enable contributes data and information to assess and characterise the burden and distribution of adverse health events [3].

3 Aim and Objectives

The main objective of this study is to develop and design a National COVID-19 Health contact tracing and monitoring system for Namibia.

Specific objectives are as follows:

(a) To identity the current methods used to trace and monitor members of business and public when visiting any enclosed public place in Namibia;
(b) To analyse the current methods that are being used to trace and monitor members of the public when visiting any enclosed public place in Namibia; and

The above application system will be used to record and capture details of the member of the public who will visit different public place in Namibia as this will allow health professionals to trace and monitor member of the public’s details in real time and statistical reports would be generated by the system which would aid in health decision making process. The system will be accessed through mobile devices such as smartphone, tablets, laptops, personal computers etc. The patient’s body like temperature, heartbeat, and blood pressure sensors will be used and the sensors will sense the body.
(c) To evaluate the current methods used to trace and monitor members of the public when visiting any public place in Namibia;
(d) To develop a database from which government and business fraternity could draw information for decision making.

4 Literature Review

4.1 Health Monitoring System

In today’s world mobile technologies and smart devices in the health zone has brought on advantage on the world critical care which can be utilized to support healthcare across the globe [4]. With an improvement in technology and the miniaturisation of sensors, there have been attempts to utilise the new technology in various areas to improve the quality of human life [5]. One main area of research that has seen an adoption of the technology is the healthcare sector. The people in need of healthcare services find it expensive and this is particularly true in developing countries [6]. As a result, this project is an attempt to solve a healthcare problem that society is currently facing. The main objective of the project was to design a remote healthcare monitoring system.

4.2 Contact Tracing and Monitor System

This system can be implemented in hospitals as well as in places of residence of the patient. The system monitors the vital health parameter: that is, the heart beat and temperature. These parameters are automatically monitored and stored simultaneously by the system [8]. If these parameters deviate from their nominal values, an alert message is sent to the concerned doctor [7]. The system promises to provide cost effective, ease of implementation, automatic and continuous monitoring of the patient.

4.3 The Tracing and Monitor Health Surveillance System

In today’s world surveillance systems play a crucial role in improving population health [10]. Similarly, [11] public health surveillance systems function is to generate information that aid businesses to make strategic decisions. Moreover, public health surveillance systems enable remote mobile health monitoring system to provide end-to-end solution such as physiologic parameters, provides doctors and family with necessary data [12].

5 Research Significance

The system is crucial because the system can keep track of the individual’s temperature from “yesterday”, “today” and “last month”. The study will also encourage real time ordering system for government medication and scheduling of materials. It will further assist to link government and business procurement services.

6 Research Methods

The study used a survey to gather requirements that enabled the development of a prototype guided by design science research which focuses on the development and performance of (designed) artifacts with the explicit intention of improving the functional performance of the artifact.

7 The Tracing and Monitor Health Surveillance System Demonstrator

This system can trace and monitor the temperature for an individual that visits public places in Namibia, which includes the temperature for the present day, temperature for last month and also the temperature for the individual for the previous day (yesterday).

7.1 Covid-19 Contact Tracer on the Namibian Map

The system can monitor and trace contact through the 14 regions of Namibia. A public member or customer that visits any public place or business anywhere, anytime in the 14 regions can be traced any time and information of that particular public member can be reported directly to the database at the Ministry of Health and Social Services in Namibia.

8 Business Benefits of the Tracing and 3.5 Monitoring System

The system will keep record of all individuals visiting public places that have an entrance for coming in and out of public places. The system replaces the paper based method of recording the details of the people visiting public places. The system will allow for the real-time monitoring of temperature changes of individuals. The social cultural variables of customers in the business environment can easily be traced by suppliers and correct business decisions that will add on to the business competitive advantage will be effected. Just in time ordering system would then be easily adopted through e-procurement.


9 Conclusion

In today’s world healthcare monitoring systems are very crucial as they allow continuous monitoring of the patient’s vital signs and also help the doctor or people in the family to monitor the emergency alarm from patients. In addition, healthcare monitoring systems help to prevent and protect the patients while the need of customers in the health sectors will be attended to without delay.

References


