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Abstract. Covid-19 is the world’s most destructive 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’s most common symptoms include fever, dryness and tiredness. It is against this background that in Namibian health environment the country uses a manual system to record public members’ demographic information when visiting public places that do not allow monitoring of every public member who visited the 14 regions in the country. Therefore, the present study developed a National COVID-19 health contact monitoring system that allows 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 going 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.

INTRODUCTION

Monitoring and evaluation has become the buzz word in the business and government sectors in today’s world. Similar studies such as [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 adoption of these three perspectives towards good governance has not yet statistically been achieved. Henceforth, for Covid-19, the world’s most recent pandemic that has been encountered in every nation of the world, a robust monitoring system is needed for institution and business decision-making. The Covid 19 monitoring tool 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 society. As such, this is not an exceptional case for Namibia. In light of the challenges caused by this pandemic, this study developed a monitoring system that could capture all the demographic details of public members visiting public places and businesses with entrance and exit points. In the future, 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 might have been diagnosed with Covid-19 might have visited specific business and other public places. The system will capture the demographic data of every customer or public member who visits an enclosed public place or business facility as well as the date and time the facility was visited. This approach is environmentally friendly and sustainable as it replaces the paper-based method of recording the information of people visiting public places with an entrance that permits the coming in and going out of people. The system will also allow for real-time monitoring of temperature 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 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. In addition, 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 a family member. In any critical condition an SMS is sent to the doctor or any family member.

PROBLEM STATEMENT

In the Namibian health domain, there is the challenge of capturing the demographic data of public members visiting public places, since it is done manually increasing the risk of 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 surveillance system that can capture all the details of every public member visiting any public place that has entrance and exit points. Public health surveillance systems are important as they enable information to be accessed and analysed to understand the severity and distribution of adverse health events [3].

AIM AND OBJECTIVES

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

Specific objectives are as follows:

(a) To identify the current methods used to monitor members of business and public when visiting any enclosed public place in Namibia;

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

(c) To evaluate the current methods used to monitor members of the public when visiting any public place in Namibia

![Figure 1. Individual’s temperature monitoring system for Covid-19.](image)

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

LITERATURE REVIEW

Health Monitoring System

In today’s world mobile technologies and smart devices in the health zone offer advantages, 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 adoption of the technology is in the healthcare sector. The people in need of healthcare services find it expensive and this is particularly true in developing countries. 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.

Contact Monitoring 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: heartbeat 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 doctor concerned [7]. The system promises to provide cost-effective, easy-to-implement, automatic and continuous monitoring of the patient.

Monitoring Health Surveillance System

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

RESEARCH SIGNIFICANCE

The system is crucial since it 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 in linking government and business procurement services.

RESEARCH METHODS

The study used a survey to gather parameters required for 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.

THE HEALTH SURVEILLANCE SYSTEM DEMONSTRATOR

This system can monitor temperature for an individual who visits public places in Namibia, which includes the temperature for the present day, temperature for the previous day and for the previous month.

Covid-19 Contact Tracer on the Namibian Map

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

BUSINESS BENEFITS OF THE 3.5 MONITORING SYSTEM

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

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 and people in the family to monitor the patient’s condition. In addition, healthcare monitoring systems help prevent critical conditions by alerting in advance.

REFERENCES


