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Development of BITIM Quiz Android Application: A Panacea for Minimizing the Spread of Covid-19

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ABSTRACT
The outbreak of Coronavirus (Covid-19) was declared worldwide by the World Health Organization (WHO) as pandemic. With its increase of affected cases worldwide, lockdown and even the protocol guidelines given to be followed by people, the transmission can only be restricted in small community or society. When considering a country of relatively large population like Nigeria, it is such a herculean task to control or minimize the spread despite various restrictions put in place by Nigeria Centre for Diseases Control (NCDC). This paper mainly focuses on development of an Android application for training and creating awareness regarding Covid-19 by providing the latest information about the spread of the virus. This Android application (BITIM) updates people through the game platform that has multiples quiz games for the users to select option that is most preferred. This application can be used as a tool for creating further social awareness which can be deployed on health facilities across the nation for employee involved in essential, non-essential duties and general public about the arising need of precautionary measures to be taken by the people. By analyzing the results downloaded from Cloud Firestore using a Microsoft Excel, it was observed that 95% of people who played the quiz game became more informed about the challenges of public health emergencies and enhanced their readiness to fight the epidemics through prevention, detection and control method. The results indicates that BITIM application serves as a dynamic tool that inspires users to develop skills as they focus on the quiz activities of the game. Hence, this study found that the level of adoption and acceptance of this technology is very high because it supports the directives from Nigeria Centre for Disease Control (NCDC) which was used as an assessment tool and not for diagnostic purposes to minimize the spread of Covid-19 across the country. However, all these functionalities were achieved and developed using JAVA, REACT Native and XML for the frontend activities, while Cloud Firebase and JSON were used in programming the backend.
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Keywords: BITIM, Android, Application, Covid-19, JAVA, React, JSON, XML, Cloud Firebase& Android Studio

1. INTRODUCTION

In present days, Information Technology (IT) based mobile application platform has proven its effectiveness and usability in various fields (Harrison, R. et.al., 2016). The people today are busy, and on the move, they are using mobile application platforms to get information and updates about various essential matters related to their daily lives i.e. from road navigation to weather forecast. According to Cyber Gear (2016), mobile applications are increasingly playing a vital role in business with a larger customer base as well as workforce relying on the convenience of access on-demand to information and solutions. The study stress that apps are becoming the dominant form of digital interaction because people are spending much of that digital time on smart mobile devices, time spent per day on mobile devices has increased by 575% in three years and 80% of the time devoted to mobile devices is spent using apps. (Chohan, A. H., et.al., 2020).

Harrison, R .et.al (2016) concluded that more tasks are being performed on mobile phone due to the usefulness of mobile devices which has greatly increased in recent years. The increment was as a result of the usability of these devices in some contexts. However, in the recent years, various application developers make use of latest technology to improve smartphone experiences, the modern day applications now look very attractive and quite easy to use. In this context Flood, et.al. (2012) conducted a survey on mobile application users which found that users spend average of five minutes or less on learning to use a mobile application.

Development of this new application called BITIM android-based Quiz application is mainly for Covid-19 sensitization purpose, allowing the users to pick from the multiple choice questions test system for different categories they belong to directly through smart phones and tablets in hands. The main goal of the application is to enable users to creating further social awareness which will provide the latest information about the spread of the virus. Currently there are several initiatives and procedures given by WHO and presidential Task force to fight Covid-19. The news and media had also played a vital role in creating this awareness by informing the public about the preventive measures that can keep them away from this virus. It is well believed that awareness among the people to carry out all the preventive measures can immeasurably help to reduce spread of the virus. This research work is to prevent Covid-19 cases from rising by providing more information on the use of medical kits like PPE (Personal Protection Kits), mask or face shield and hand sanitizers in form of game to make it fun and educating at the same time.

2.0 MATERIALS AND METHOD

The development of BITIM Quiz Application adopted React Native framework for exciting user interface and Firebase for the real-time database. React Native creates the real and exciting interface with the help of JavaScript. React Native is used for several applications development for Android, Android TV, iOS, macOS, tvOS, Web, Windows and UWP by enabling developers to use the React framework along with Native platform capabilities. React Native was chosen because of its cross platform support which make the quiz to be compatible with different platforms. Cloud Firebase on the other hand, provides backend service. The service gives an API that allows application data to be synchronized across users' device and stored on Firebase's cloud in JSON structure.

2.1 System Analysis

BITIM Quiz application is an android based system that designed to educate the populace on the reality of Covid-19, ways to stay safe and stop the spread in form of game. The procedure for using the application is discussed below by the algorithm and the flowchart:

2.1.1 Purpose: This pseudo code basically explains the entire process of the quiz application.
Input: categories, instruction
Output: time range, name, score, solution
1. Start
2. Lbtime 15 // initialize time range variable
3. If category = Start Then
4. {Display time range for each question}
// ……
5. If (question screen is initialized) then
6. {Set Listpicker.element = 15 to 0
7. Set continuebutton.enabled = false
8. Call DB.store value}
9. IF (listpicker.afterpicking =true) then
10. {Set continuebutton.enabled = true
11. Set Lbtime= listpicker.selection}
12. If listpicker.selection<10 then
13.{Append 0 ahead of Lbtime
14. Lbtime= Lbtime – 1}
15. If (Mode = NonTime) Then
16. Display main categories
17. End

2.1.2 BITIM Application Process Flowchart

The operational flowchart (figure 1) explains the procedural steps to use the application. The first step is the lunch the application on the android desktop by clicking the icon on the screen (figure 2). This indicates that the application is properly installed with a link to open it. The main screen is displayed after the splash screen disappeared. The main screen displays two navigations namely: select categories and instruction button. The 'categories' button is the link to the three categories namely: essential worker, non-essential worker and general public. Essential workers are employed in roles that are vital during a natural disaster or emergency, such as healthcare workers, emergency services, while non-essential workers are those their duties do not affect health and safety infrastructures. When one of the categories is selected, the page loads quiz questions of different options for users. Figure 3 further explained the BITIM App containing the quiz, home button, timer and total numbers of quiz. Figure 4 shows the screen when the timer count-down to zero, this deactivated all the options and displayed dashboard for options like; hint to the right answer, next button and home button. On selecting the wrong within the time allotted for each question, the system disabled all the options and activated both the 'show the correct' and next quiz option-button. It also notifies the user the total number of quiz passed or failed and the numbers of questions remain. Figure 5 shows the screen of quiz with correct answer picked and this was alighted as color green. Lastly, figure 6 shows the result screen of a user who attempted the quiz. This displayed part of the question the user got and missed with solution to all the quiz attempted.

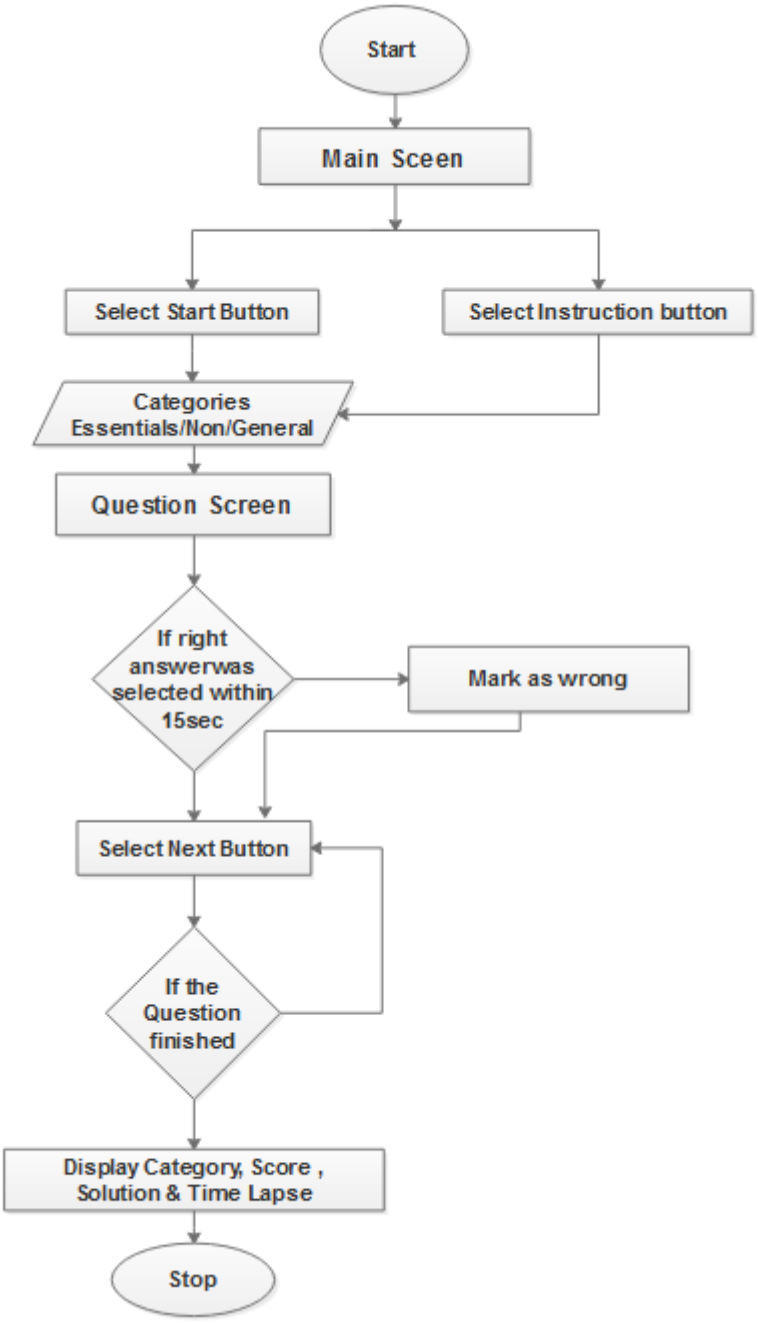

Fig 1: Operational Flowchart

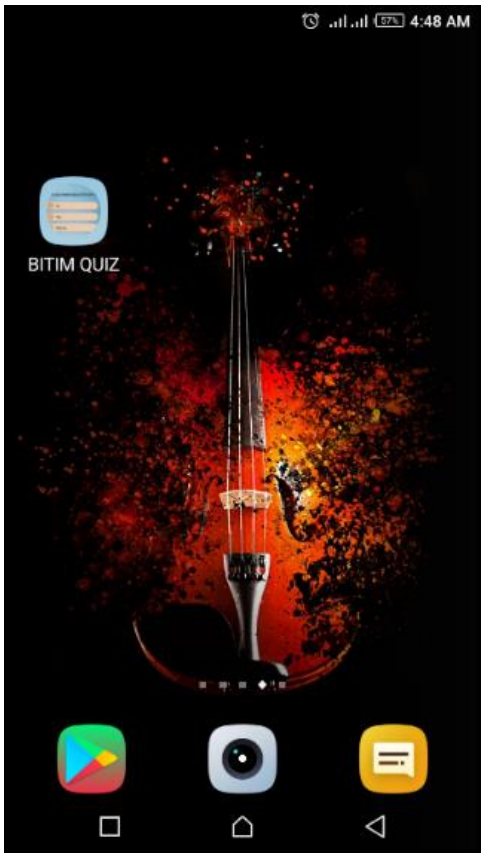

Fig. 2 Shows the BITIM Icon on the Android phone

Fig. 3 Loaded question and deactivated next buttons

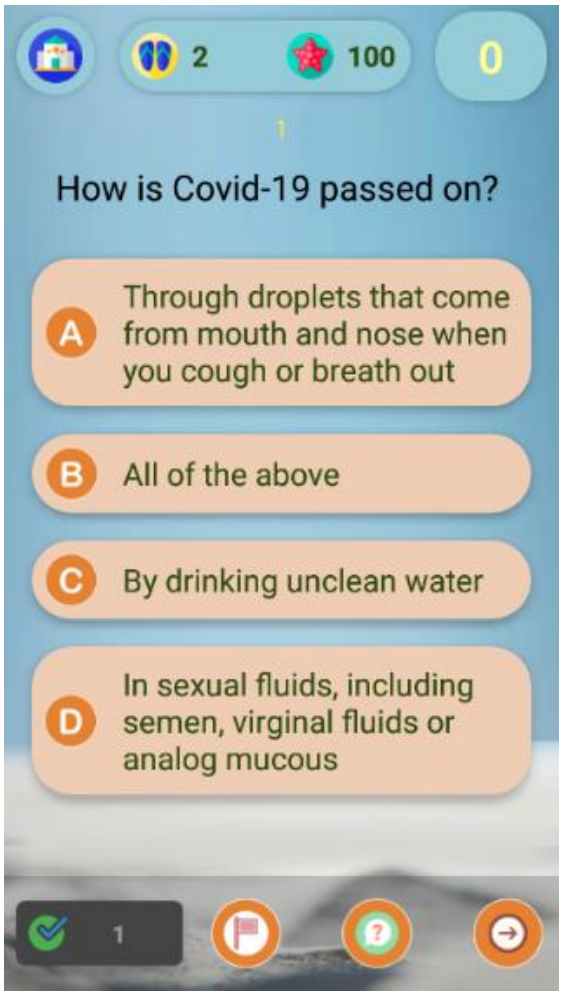

Fig. 4 Shows the screen count down to zero & activated other buttons

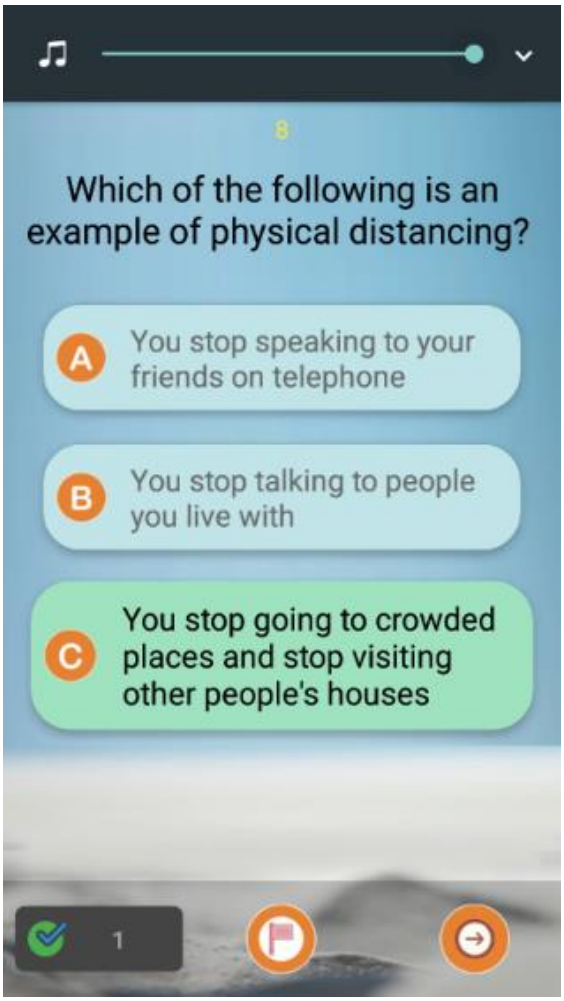

Fig. 5 Shows the Selected and correct option as green color

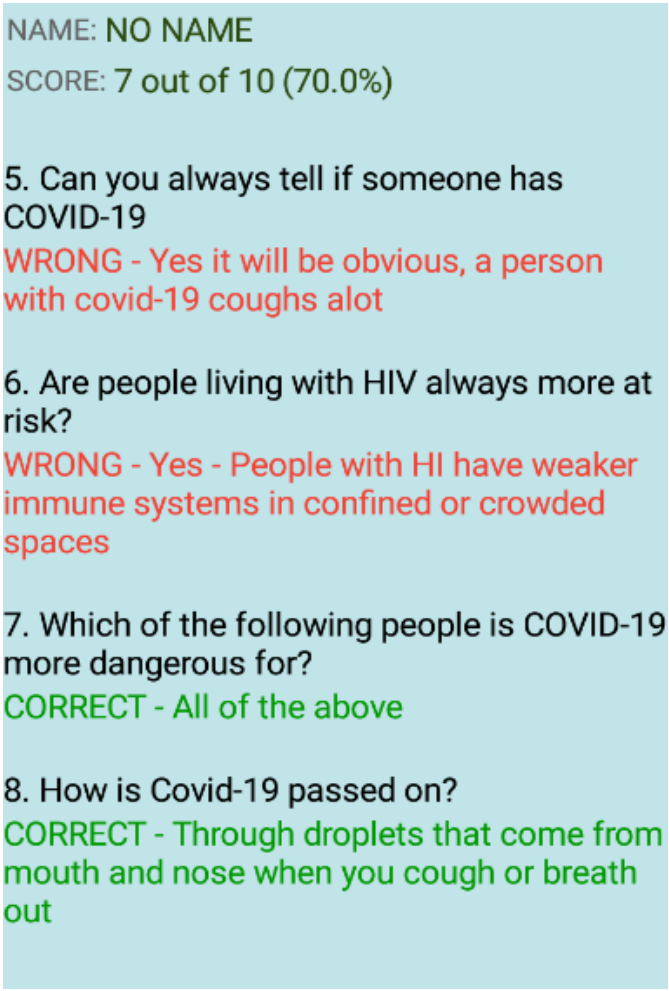

Fig 6: Shows the Result screen after taking quiz

3.0 RESULT AND DISCUSSION

After the building stage of the quiz application, it was therefore tested on an android mobile phone in order to be sure it works according to the required design specification. The tests carried out are:

3.1 Program Test: The application package kit which was built on android studio using XML and JAVA was carried out. Errors were seen and debugged and corrected. The functionality of the application was ensured during this phase.

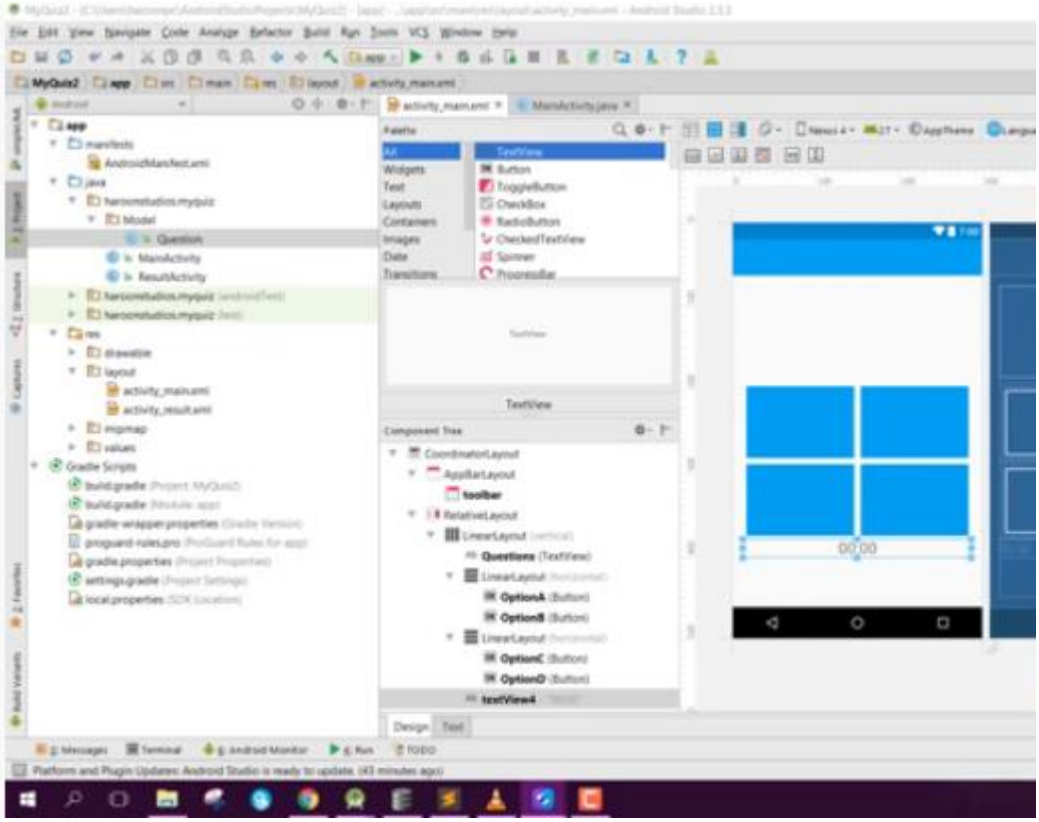

Fig. 7 Android Studio backend during debugging of errors

3.2 Application Testing

Application-testing was carried out on real devices, with real users. This determined the levels of usability and to be sure of the aim and objectives of which the quiz application was designed. Testing was frequently done, iteratively, even during the lockdown. Also, it was tested on a variety of platforms for cross-platform compatibility with different screen sizes and different carrier connections, network to confirm that they accommodate both online and offline usage. The figure 8 below explained the responses of different users which were captured within the time limit.

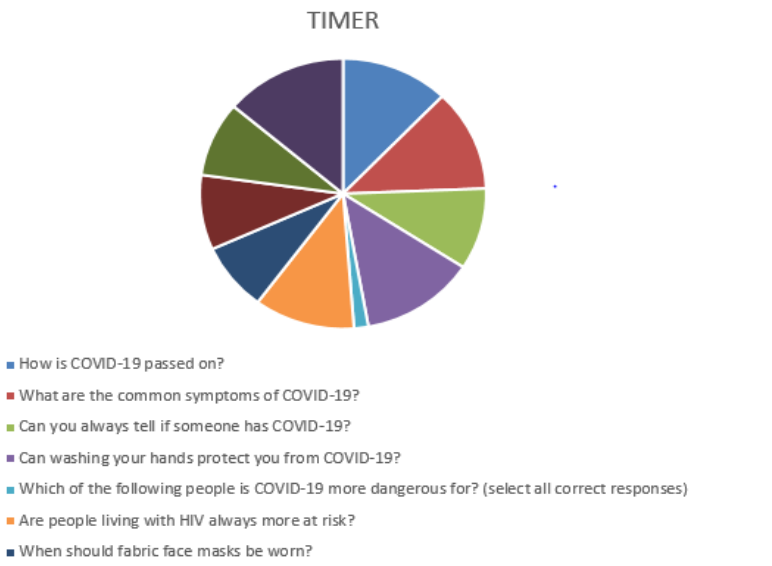

Figure 8: Question bank

4.0 CONCLUSION

The quiz game was designed to fix the awareness programme on the Covid-19 virus and to intimate the users on the precautionary steps in other to get safe by providing the users the fun to learn new strategy in a fresh mood to stay safe while on the go. BITIM application was developed to facilitate the users to be able to take short quizzes using portable devices such as smart phones and tablets. The detailed result in excel format was downloaded from the Cloud Firestore and analyzed to see that 95% of users who played the quiz game application were more informed, became more safe, smart and more ready to fight Covid-19. Hence, this quiz application has been suggested as a method to minimize the spread of Covid-19 across the country.

5.0 ACKNOWLEDGMENTS

We want to express our special gratitude to the Almighty who has blessed us with such hidden talent for steering this research paper to its destination.

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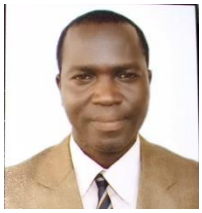

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