

ABSTRACT

Natural disasters are one of the events whose presence cannot be predicted by humans. When an area is hit by a disaster, there is infrastructure damage. One of the infrastructure damages can occur in the telecommunications sector and can interfere with the process of long-distance communication (telecommunications). Therefore, there is a need for a portable device that is able to offer a solution by reviving telecommunication capabilities for this condition.

The solution to the problem is to create a device consisting of a VoIP server, Wi-Fi network, antenna and radio, as well as batteries and solar panels. All components of this device are assembled in a portable and rain-resistant box. It is hoped that this tool will serve as a support for the telecommunications system during the next disaster if the main system has not fully recovered. With this device, important information such as the number of casualties, financial losses, and current conditions can be accessed quickly through the provided temporary telecommunications network. This will enable rescue teams and authorities to respond more effectively and timely, while minimizing the negative impact caused by the disaster.

VoIP quality of service (QoS) on the Wi-Fi interface shows satisfactory results according to ETSI standards with an average delay of 16.36 ms, jitter of 18.31 ms, packet loss of 0%, and stable throughput of 100.6 kbps. QoE showed a MOS value of 4.2 indicating good voice quality. Radio antenna testing reached a distance of 15 km, Solar Panel performance showed a voltage drop from 21.8 V to 20.4 V and current from 6.05 A to 4 A in 13,080 lux light. The 18650 lithium battery experienced a voltage drop from 12.3 V to 10.7 V over 3 hours of use and did not reach maximum voltage while charging, indicating the need for ideal lighting conditions for efficient charging. All components and tests have met the specified standards.

Keywords : Disaster, Telecommunication, Webphone, Portable, Emergency