

ABSTRACT

Internet of Things (IoT) is an indispensable method of interchanging information through applications while connecting to the internet. IoT enables various devices to communicate with one another without the obligations of using old-fashioned communication styles such as data cable, external flash drive, and disks. People nowadays connect their smartphones to the Wireless Fidelity (Wi-Fi) by manually typing the Wi-Fi password to their smartphones.

This thesis demonstrates the effectiveness of using Quick Response (QR) code and Captive Portal for protecting the Wi-Fi password and also to prevent an unwanted user from abusing the Wi-Fi respectively. The public area Wi-Fi users scan the QR Code to obtain the Wi-Fi username and password. The Captive Portal is a gateway does not permit any internet connection before the user gets identified. Thus, simulation and experimentation are required. This thesis uses ZXing QR code application for obtaining the Wi-Fi's password and router Tenda W15E AC1200 for getting the Captive Portal feature.

The measurement approach consists of qualitative and quantitative. In qualitative, surveys are spreaded to know the satisfaction of the owners and customers with this technology. The survey result obtained is $> 80\%$ of satisfaction for thirty six respondents. In quantitative, both functionality and Quality of Service (QoS) parameters are assessed. The functionalities are related with the scanning distance, scanning angle, and bandwidth. Optimal distance is 20 cm with average scanning time taken of 145.4 ms, optimal angle in both X-axis and Y-axis are 0° - 50° and 290° - 360° . In terms of QoS parameters, the bandwidth, throughput, and delay are tested and the results are within the tolerable range for Wi-Fi. Based on the results obtained, the throughput is 20 Mbps or 2.5 MB/s, the bandwidth for download is 700 KB/s and for upload is 300 KB/s, and the average delay is 1 ms. The security of the public area Wi-Fi is safe as the password is delivered in QR code and is not leaked to the user. In addition, this thesis prevents bandwidth utilization loss as the bandwidth is managed and limited by the Captive Portal.

Keywords: QR code, Wi-Fi, IoT, Captive Portal