

## Development of Offline Chat Application

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### ABSTRACT

the purpose of this study is to develop an Offline Chat Service, by which a user can send a message in the absence of the internet, cellular data and signal. The Wireless Fidelity or Wi-Fi will serve as their access point to connect to another user, which can detect and pair into a different device as long as the other users are connected in the same network. But before the user can fully exchange messages; User B must accept User A's request to exchange messages, if User B declines the request, both users can search another device again to send a message. The mobile application can only pair into Android Devices.

Keywords— Chat, Offline Chat Application, Mobile Application, Local Area Network, Emergency Response

### I. INTRODUCTION

Chat Applications nowadays are so relevant. People are using different kinds of chat applications almost every day, which can send messages or even have a call internationally as long as there is internet available, whose impact on everyone is so large that Chat can replace the technology of Text messages. In simple online buying, one has to communicate with sellers with the use of Chat Application, and reserving a fine dining can be done through Chat. It made a big difference in society. The core value of chat for every user is: it can send messages to someone instantly, especially when it comes to emergencies. In the past, it would take an hour or even days to send a message, however, the mass of the population of chat apps, are dependent on the internet, data or cellular signal.

In conclusion, the researcher is aiming to develop an offline application which can send messages and track the end user without the help of the Internet. So, in case of emergencies, users can send messages to someone, so as to accept aid as soon as possible.

It will be a huge contribution to the community, especially now the society today is dependent on the growing technologies. Having an application that is no longer dependent on the Internet will be a help to a lot of people. The application can still be used even if there is no calamity, offline chat application for resilient Disaster management can also serve the user to find peers around the area and have some fun while sending messages and images of each other.

### II. RELATED WORKS

Offline Chat Application for Resilient Disaster Management is an application that helps to connect

a mobile device using WIFI, which serves as an access point to another device in nearby range. If a calamity like “The Big One”, will strike China and there is neither internet connection nor the cell towers are down; this application will be a big help. Thus, this application can also serve as an instrument to connect or discover new friends around the area.

Using Wireless Local Area Network (WLAN), the user can connect with each other; WLAN is a type of Local Area Network that uses high-frequency radio waves rather than wires to communicate with nodes. In a wireless local area network, an access point is a station that transmits and receives data (sometimes referred to as a transceiver). An access point connects users to other users within the network and also can serve as the point of interconnection between the WLAN.

The solar photovoltaic systems, especially those integrated with urban buildings and connected to distribution system, have several advantages over the electrical system, many of which can avoid costs, which are not yet considered or quantified, such as:

- a) reduction of losses due to transmission and distribution of energy, as electricity is consumed where it is produced;
- b) Reduction of investment in transmission and distribution lines;
- c) Buildings with integrated photovoltaic technology do not require dedicated physical area;
- d) solar photovoltaic buildings provide larger volumes of electricity at times of peak demand;
- e) When strategically distributed, photovoltaic generators offer minimal idle generation capacity for its great modularity short term installation, providing speed on the demands of adding generating capacity. Under the application, there are different ways to connect to different devices, Network Service Discovery, Wi-Fi Peer To Peer and Wi-Fi Direct Service Discovery.

In Wi-Fi Peer To Peer, the Wi-Fi Direct feature of the users has to be switched on. Wi-Fi Direct allows two devices to establish a direct, peer-to-peer Wi-Fi

connection without requiring a wireless router. Wi-Fi becomes a way of communicating wirelessly, like Bluetooth. Wi-Fi Direct is similar in concept to “ad-hoc” Wi-Fi mode. However, unlike an ad-hoc Wi-Fi connection, Wi-Fi Direct includes an easier way to automatically discover nearby devices and connect to them. All Android Devices has the feature of Wi-Fi Direct

Another option to detect the devices that are connected within the router is the Network Service Discovery; Android NSD allows the researcher’s app to identify devices in the same network that offer the services we are requesting. With NSD the user can register, discover and connect with our service (or other services) over a network Similar to a broadcast receiver and intent broadcast in android. Device 1 advertises some service that says Multiplayer chess and device 2 discovers it, connects with it and WLAN chess use cases are solved. Not all NSD is equal; some implementations provide service resolution.

The last option in the application is the Wi-Fi Network Service Discovery, It works the same with the Network Discovery Devices, and the difference is, NSD is running with the help of router, thus, WNSD works even though the router is not around, as long as the Wi-Fi Direct of the Smartphone is switched on. Using Wi-Fi direct service discovery we can append additional data (100-200 bytes) with the advertised service. So unlike Wi-Fi direct, we can request port dynamically and append it with service. No prefixed port.

With the help of the three choices, the user can detect each other, as long as they are in the same local area network.

### III. METHODOLOGY

This research used Java programming language in Android platform for the Mobile Application. Adobe Photoshop was also used to make the system possible with the minimalist design of the application. The study also involved a different group of students, in the College of Computer Studies in University of

Perpetual Help System Laguna. This research used a software evaluation following ISO9126 criteria and distributed to the users of the Pilot Area during the Survey and test.

Likert's scale with the interpretation of Strongly Agree, Agree, Neutral, Disagree and Strongly Disagree were used to specify the users' level of agreement or disagreement on the software evaluation items.

The results of software evaluation are presented in the succeeding sections of this paper.

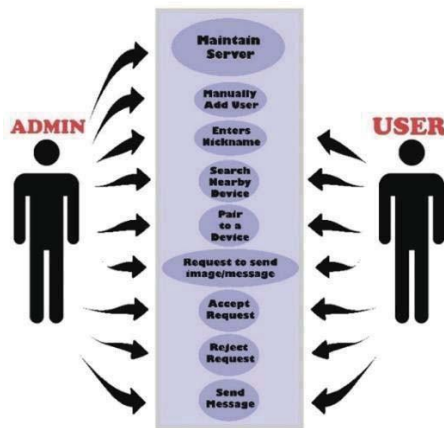


Fig. 1. Use Case Diagram

Fig.1 represents the Use Case Diagram of the System, it shows that the Owner can manipulate everything in the Application, while the user has the limits of Checking how many are connected in the router as well as adding a user in the Local Area Network.

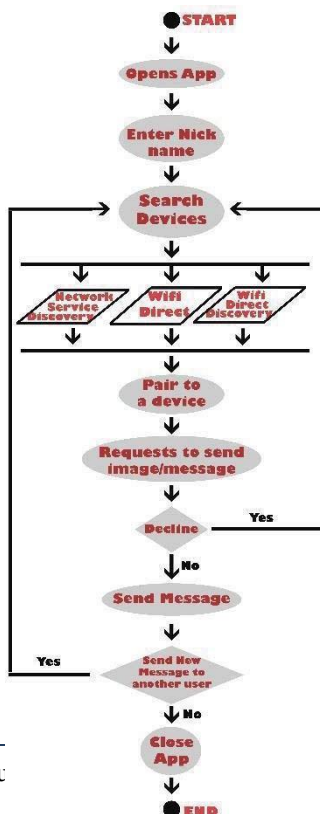


Fig. 2.a. Activity Diagram (Admin)

Fig.2 represents the flow of the Activities of the system. When the user opens the Application, the user has to enter a nickname first. The three buttons below are the key to search for devices that can search the devices that are in the same WLAN. once the application searched the devices, user-A may select another user to send a message, it has a request first before the user can send a full message, if user-B accepted the request they can exchange messages without the need of internet, but if the request was rejected by user-B, user-A will be directed again to choose another device to send a message.

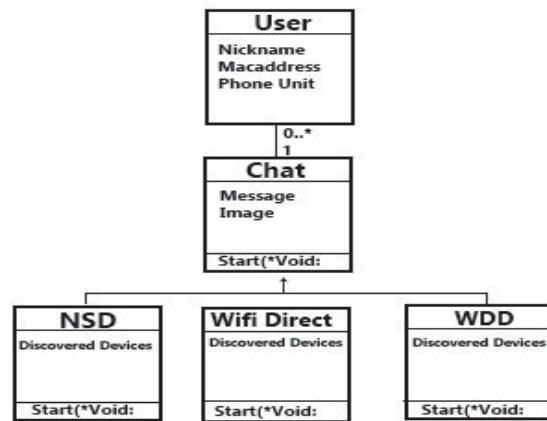


Fig 3. Class Diagram

Fig.3 represents the class diagram of the system; it explains on the diagram that the User part has the information of User's Nickname or Phone Unit and Mac Address. Next part is the Chat part; the only information is messages and images. Lastly the 3 subclasses are the Network Service Discovery (NSD), Wi-Fi Direct and lastly is the Wi-Fi Direct Discovery (WDD) which only needs the Discovered Devices.

The Application has to use Router, to serve as the user's access point. The different user needs to be connected in one Local Area Network for that they can connect to other devices. The application also needs a wifi, for all the messages will go directly to the IP and it will do its job to distribute the messages to the recipients. It will be programmed in FIFO (Firs in First Out).

Category	Specification
Router (ASUS/ RT-N14UHP High Power Router / AP / Range Extender Wireless- N300)	802.11n single-band Wi-Fi router with detachable high-gain dBi antennas for boosted wireless range. USB Port for printer networking, storage, sharing, or 3G/4G connections.

#### IV. RESULTS AND DISCUSSION

The succeeding parts of this section present the Offline Chat mobile application. Fig.4 presents the system architecture in mobile platform covering the users, admin, and existing users.

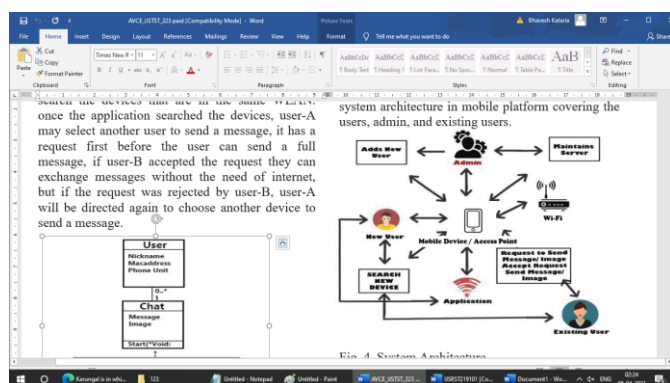


Fig. 4. System Architecture

#### V. CONCLUSION AND RECOMMENDATIONS

This research aims to provide a mobile application that can send messages without the help of Internet and Cellular Data or Signal. The software evaluation also indicates the relevance of the features provided for users and security safety. However, this research has also some recommendations to enhance the findings of the study including: (a) developing an iOS version of the Offline Chat Application; (b) Offline tracker to be able to track down people even

if they could not response in the messages (c) integration of the Offline Chat Application For Resilient Disaster Management in the whole country.

FUNCTIONALITY	4.73
RELIABILITY	4.70
USABILITY	4.68
EFFICIENCY	4.47
MAINTAINABILITY	4.72
PORTABILITY	4.72

TABLE III. SUMMARY OF THE SOFTWARE EVALUATION

Table III represents the Evaluation of the Application with use of Survey in Likert Scale. Functionality has a weighted mean of 4.73, which falls on the scale under Agree (A). It means that the respondents have AGREED that the proposed system is suitable to run on any android devices. Reliability has a weighted mean of 4.70, which falls on the scale under Agree (A). It means that the respondents have AGREED that the proposed system is suitable to run on any android devices. Usability has a weighted mean of 4.68, which falls on the scale under Agree (A). It means that the respondents have AGREED that the proposed system is suitable to run on any android devices. Efficiency has a weighted mean of 4.47, which falls on the scale under Agree (A). It means that the respondents have AGREED that the proposed system is suitable to run on any android devices. Maintainability has a weighted mean of 4.72, which falls on scale under Agree (A). It means that the respondents have AGREED that the proposed system is suitable to run on any android devices. Portability has a weighted mean of 4.72, which falls on the scale under Agree (A). It means that the respondents have AGREED that the proposed system is suitable to run on any android devices.