Mafqudat: Arabic Smartphone Application for Reporting Lost and Found Items

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***Abstract*— Nowadays, missing or losing items has become a common problem owing to our stressful and pressured lifestyle. Losing items can be highly inconvenient and may have an effect on emotional well-being. However, technology can be employed to provide effective solutions to help people in searching, verifying and finding their missing items. In response, a solution for effectively searching for the missing items in an outdoor environment is presented. This paper proposes a mobile-based technology designed for Arabic users for a more efficient method of finding lost items easily and quickly.**

Keywords: component, lost, found, item, insert, application

I. INTRODUCTION

We lose track of things from time to time, and some of us might be robbed and experience difficulty retrieving their property. Losing items (e.g., important documents, certificates, phone, tablet, laptop, wallet, keys, luggage, jewellery) can be nerve-wracking and inconvenient, and the amount of suffering increases as a person becomes more connected to the missing item. Taking basic measures when losing property (especially one of high value) such as submitting a formal report to the police or visiting the lost property offices in public locations may not be sufficient to ensure the retrieval of lost items.

The search and retrieval of lost and missing items consumes time and effort as well as being a cause of money wastage [1]. In 2013, a survey in the USA revealed that about 177 billion dollars are wasted annually in searching the lost items. The study also revealed that people consume about 30 minutes in a week searching for their lost items [2]. UK Finance reported that over £1.2 billion were the United Kingdom fraud losses in 2018. According to the firm, lost and stolen card incidents represented 14% of overall card fraud losses in 2018 [3].

II. FINDING LOST ITEMS

Peters et al. conducted a study to investigate types of objects that are commonly lost and general strategies that people typically used to find lost objects in the home environment [4]. According to the results of the study, losing objects can be a frequent issue faced by many people and the loss rate can vary significantly with age groups. According to the study, common strategies used for finding lost objects can be classified into five categories: the locus search (33%) (i.e., area in which the object is normally to be found); exhaustive search (24%); retrace search (19%) (i.e., one based on the sequential order of a person's prior physical location); memory search (11%) (i.e., one based on a person's recollection of prior interactions with the object); and delegation search (11%) (i.e., someone other than the person needing the object searches for it) [4].

In an outdoor environment, however, it can be harder to remember the location of a lost item. In this matter, the use of technologies that help in enlisting the public to maximise the chances of locating lost items can be worthwhile.

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III. LOCATOR TECHNOLOGY

Technology can be employed to provide effective and supportive solutions to help people in searching, verifying and finding their missing items. Indeed, different support systems using locator technology and devices such as radio frequency (RF) and active radio-frequency identification (RFID) have been proposed to help in finding missing or misplaced items indoor spaces [5] [6] [7].

In an outdoor environment, it can be difficult to determine the domain of the lost item. Several researches concerning missing items in an outdoor environment have been conducted. Lac et al. proposed a solution to estimate the position of a lost item in an outdoor space using Bluetooth Low Energy (BLE) tag; this method shows that it can help in finding item located outdoor; however, there are several limitations that influence the effectiveness of their proposed solution, such as it is only useful for finding items with fixed positions [8]. Similarly, a study conducted by Chan et al. proposed a mobile device that uses radio frequency identification (RFID) and global positioning system (GPS) to keep track of tagged items locations when carried around. The proposed RFID-based system sends an alert to user once the item is out of range of the RFID reader. Even though the proposed system provides a new security solution to track and secure a personal item that is carried around, the proposed solution, to be effective, requires the user to perceive the alert in the right away in time. Moreover, the RFID-based systems cannot keep track of lost items exceeding a range of 1.5 metres [9].

This paper proposes an innovative solution for finding missing and lost items in outdoor spaces, relying on the use of the readily available mobile phone devices and the internet. An Arabic mobile phone-based application (Mafqudat) is proposed, giving its users the opportunity to report missing or stolen items, where the public can view and respond with helpful information regarding the lost item.

IV. MAFQUDAT SYSTEM

Mafqudat is designed specially to support Arabic users, and it can be considered as a matching service for those who lost items and those who found items. This proposed application is compatible with iPhone, iPod Touch, and iPad on iOS, and it uses GPS technology.

Through Mafqudat, a user will be provided a space to reach a wider society to report items that have been lost or found. Mafqudat will rely on community-level engagement and cooperation to help in retrieval of lost items which in turn will help to create a safe and supportive environment to live in. It is expected that the application will achieve the following:

- Provide a reliable way to report lost items to a wider community.
- Provide a linking space for those who have lost items and those who have found items.
- Speed up the process of searching and finding missing items.
- Foster a supportive community environment.
- Give individuals a sense of belonging and a feeling of connectedness with their community.

A. System design

Figure 1 below depicts the flow of control in a system and steps involved in user interaction with the system. As Figure 1 below shows, in order to use the application, a user needs to sign up through several sign-up steps (e.g., creating username and password, complete, accept terms of service), and once all those steps are completed a record for the user will be set up. The user can then login to the system.

After login, the user who lost an item/s can report or post the details of lost or stolen item/s on the lost tab, and when and where the loss occurred. The user can also post photos of the lost item so other users can easily identify it. In the Mafqudat users' network side, whoever finds or comes across a missing or lost item can easily and quickly contact the advertiser about their missing item.

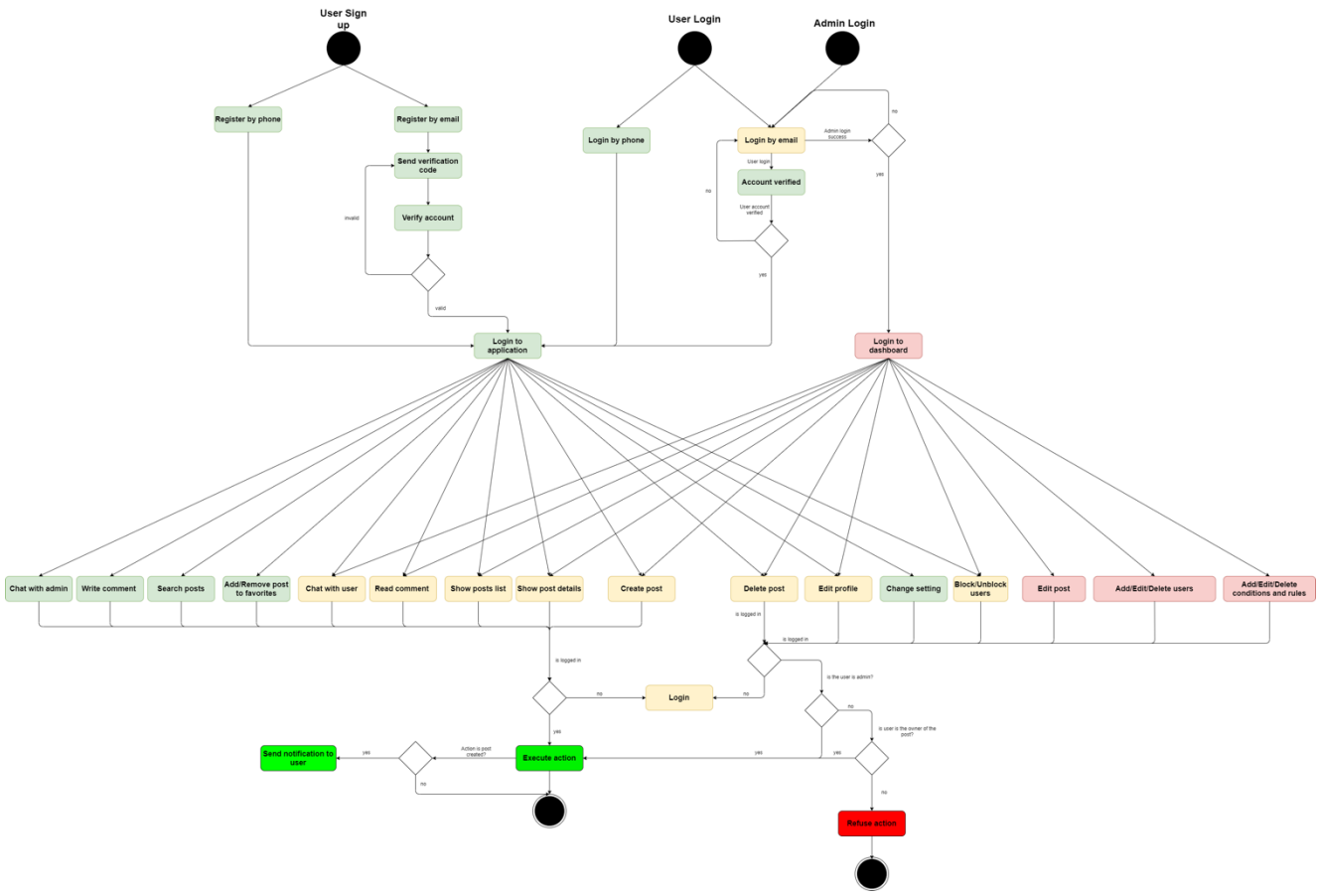

Figure 1: Activity diagram.

In the case if the user finding an item, the user can post details of found item on the found tab of Mafqudat. To help user to make honest attempts to locate the true owner of found item, the user will not be given the option to attach the image. All the reports or posts of found or lost items will be sorted from latest to earliest. When the owner comes across post, he/she can through Mafqudat contact the advertiser about their item and provide an accurate description of it.

Additionally, as one of its features, Mafqudat sends Push Notifications based on user's physical location, as an effective way to help to speed up the process of finding a lost item or finding owner of found item. Once a user or advertiser reports a lost or found item, he/she can determine, using the map, the location of where the item has been lost or found. Mafqudat users' network will receive a real-time push notification when they physically move near the geographic area in which the item has been lost or found.

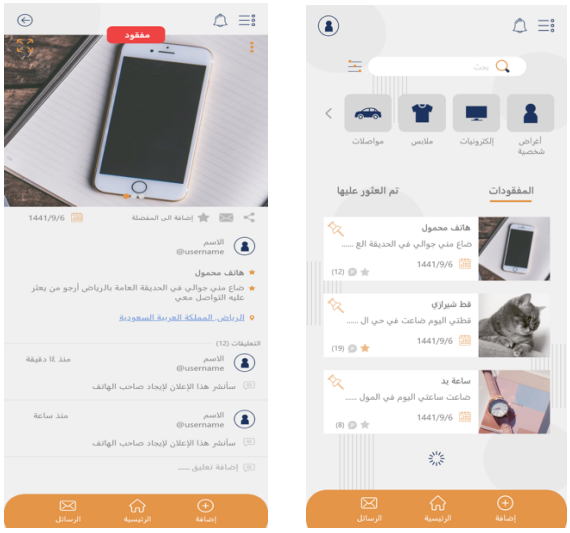

Figure 2: Lost item's interfaces.

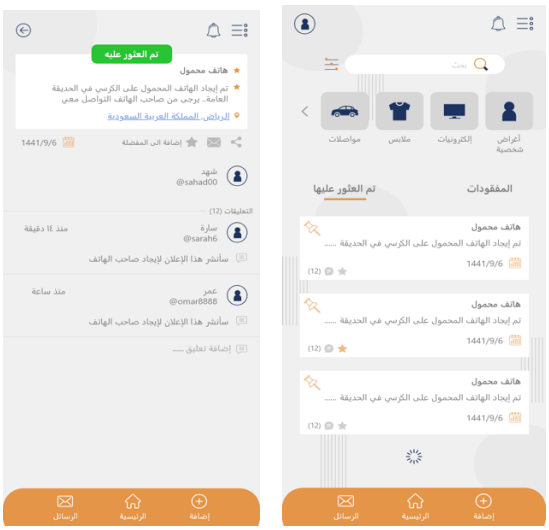

Figure 3: Found item's interfaces.

CONCLUSIONS AND FUTURE WORK

Losing an item, especially a valuable one and one that we are emotionally connected to, can have an impact on emotional well-being. ICT technology could provide solutions to people who are often affected by these types of loss. In response, this paper has proposed an Arabic application that can be easily used to report lost and found items to wider community. The search process can be time critical, and this proposed app can help to speed up the search by letting other users know what is being looked for; it is never known who has spotted the item and is waiting to return it.

Mafqudat will highly reflect the positive integration between members of society, mainly relying on users' network involvement.

Though we feel that our proposed system can be an effective solution, there is still room for improvement. Given this, in future work we will evaluate the proposed mobile phone-based application by measuring its performance and usability in a real environment with real users.

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