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Syracuse Application Forensics: Is "Orange Safe", Safe?

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Abstract

This research conducted a static forensic analysis of "Orange Safe", the safety application developed by Syracuse University, and confirmed its safety as currently used. The objective of the research was to analyze how much personal data was collected, how the data was utilized, and to evaluate whether it was used appropriately. The results indicated that "Orange Safe" collected only the minimal amount of personal data, gathered information only with user permission, and removed it immediately after use. Therefore, the research supported that this application ensured user privacy and safety, making it a reliable safety "application" for the Syracuse university community.

INTRODUCTION

Syracuse University's safety application "Orange Safe" provides quick access to emergency services, safety resources, and real-time notifications. To provide these services, the app requests access to student ID, device ID, real-time location data, log data, IP address, media access, and the camera.

Because this app requests a substantial amount of personal data, a forensic analysis of both the app and the data collected is warranted.

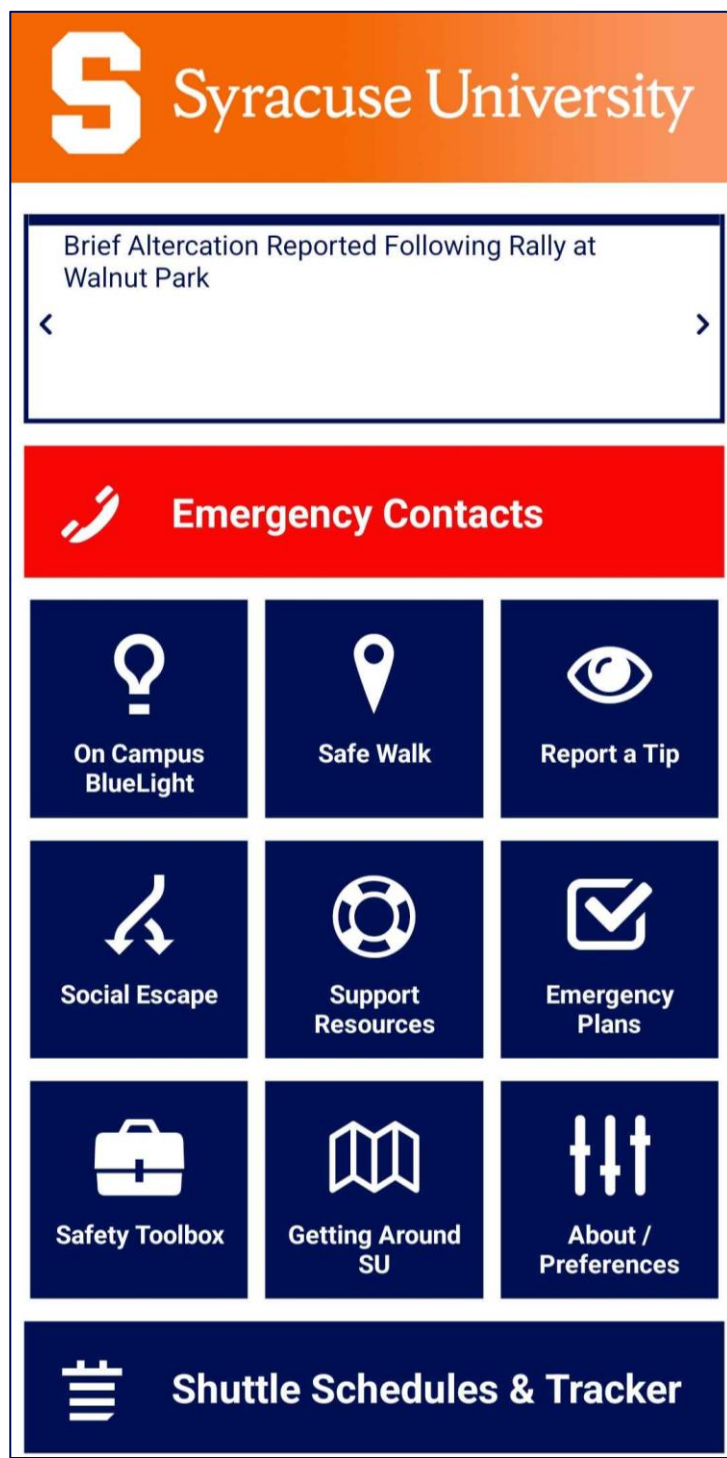


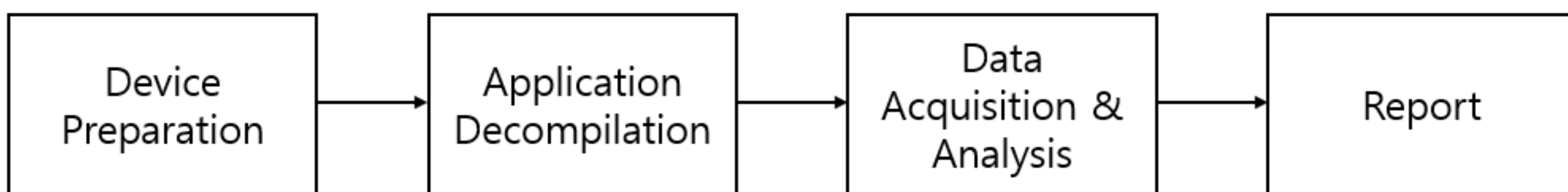
Fig. 1. Orange Safe Main Screen



METHODOLOGY

This research conducted a static forensic analysis to evaluate the data collection and utilization of the "Orange Safe" app. The investigation focused on the permissions the app requests and identified the services using these permissions.

1 Analysis Procedure



- 1) Prepare the device intended for application execution.
- 2) Extract and decompile the application.
- 3) Collect and analyze data regarding the permissions requested and the services using those permissions.
- 4) Report the results of the analysis.

2 Test Environment and Device Preparation

- Galaxy A90 5G with Android 12
- USB cable
- Workstation with Windows 11, Intel i5, 64bit
- Android Dex decompiler JADX with version 1.5.0
- Orange Safe application with version 1.3



RESULTS

1 System and device permissions

Permission List	Description
WRITE_SETTINGS	Permission to read or write system settings.
SYSTEM_ALERT_WINDOW	Permission to send alarms and vibrations from the system.
VIBRATE	
READ_APP_BADGE	
USE_BIOMETRIC	Permissions to use biometric information during login.
USE_FINGERPRINT	
GET_ACCOUNTS	Permission to access account ID and service information registered on the Android device, used during login.

The app requests minimal information needed to provide services, such as device ID, account ID registered on the Android device, biometric information, system alarms, and vibrations.

2 Call and message permissions

Permission List	Description
READ_PHONE_NUMBERS	Permissions to access the phone number list and message contents.
READ_SMS	
READ_PHONE_STATE	
MODIFY_AUDIO_SETTINGS	
RECORD_AUDIO	

The app requires these permissions to make emergency calls to security.

3 Location information permissions

Permission List	Description
ACCESS_BACKGROUND_LOCATION	Permission to collect of location information.
ACCESS_COARSE_LOCATION	
ACCESS_FINE_LOCATION	

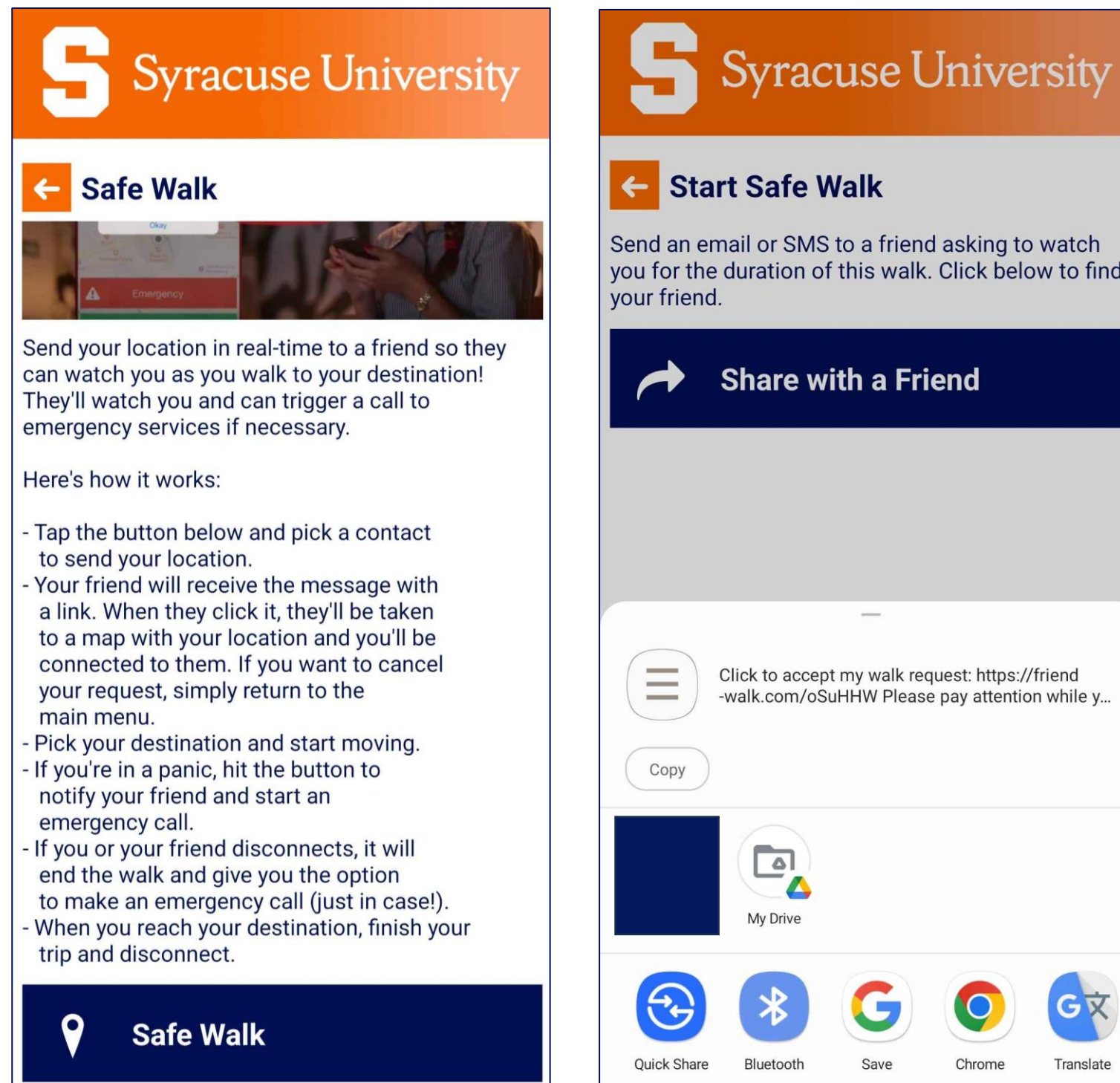


Fig. 2. Safe Walk Screen

Access to location information is required when using "SafeWalk". A message requesting location permissions appears when the Safe Walk service is initiated.

If location sharing is allowed, the user can select a friend's email or SMS to send their real-time location while using "SafeWalk".

Once "SafeWalk" is finished, location sharing and real-time location collection stop, and there is no further use of the location information.

```
public void didUnregister() {
    stopLocationUpdates();
    stopForegroundService();
    this.mTask = null;
    this.mPendingIntent = null;
    this.mLocationRequest = null;
    this.mLocationClient = null;
}
```

Fig. 3. Location sharing and collection stop code section

4 Internet permissions

Permission List	Description
ACCESS_WIFI_STATE	Permission to access network information, network connections, WiFi MAC address, and WiFi name.
ACCESS_NETWORK_STATE	
INTERNET	
CHECK_LICENSE	

The app uses the internet for services such as app login, Safe Map display, and Report. Also, the app requests permissions for facilitate these functions. The network access is also required for content updates within the app and app updates.

5 Camera and Recording Permissions

Permission List	Description
CAMERA	Permission to take photos and videos, as well as to save and access the captured content on the device.
READ_EXTERNAL_STORAGE	
WRITE_EXTERNAL_STORAGE	

```
<uses-permission android:name="android.permission.READ_EXTERNAL_STORAGE"/>
<uses-permission android:name="android.permission.WRITE_EXTERNAL_STORAGE"/>
<uses-permission android:name="android.permission.CAMERA"/>
```

The camera permission is used only for taking photos and videos for the "Report Suspicious Activity" or "Send a Photo to Security" features. The app does not access files in other situations.

CONCLUSION

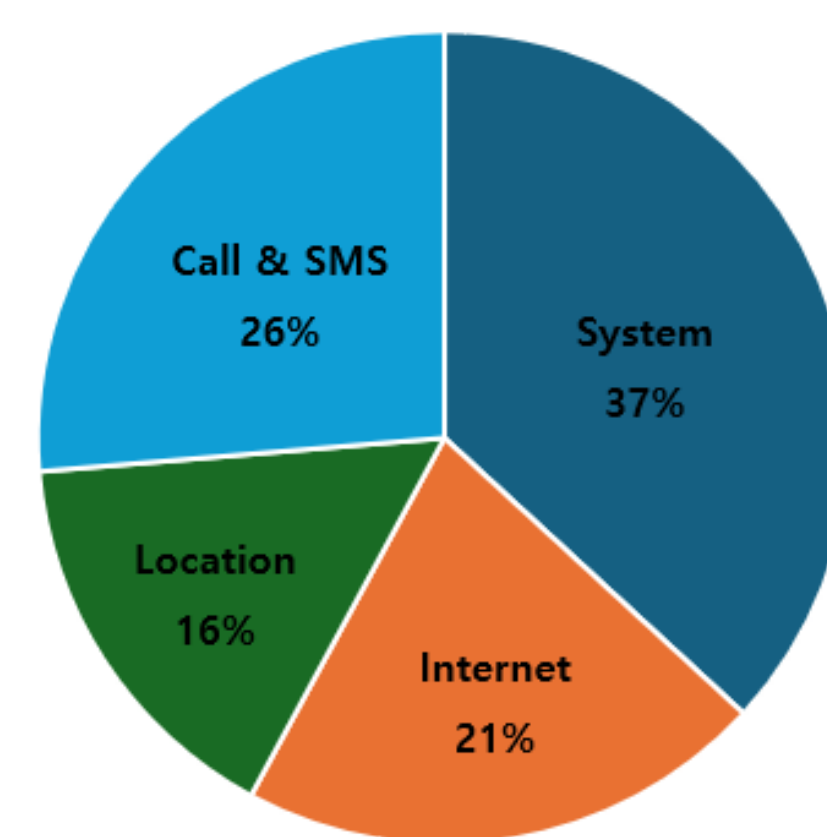


Fig.4. Percentage by Permission Type

In conclusion, this research confirmed that the "Orange Safe" app requests only the essential permissions to provide its services. In addition, all personal information is used only with the user's explicit consent.

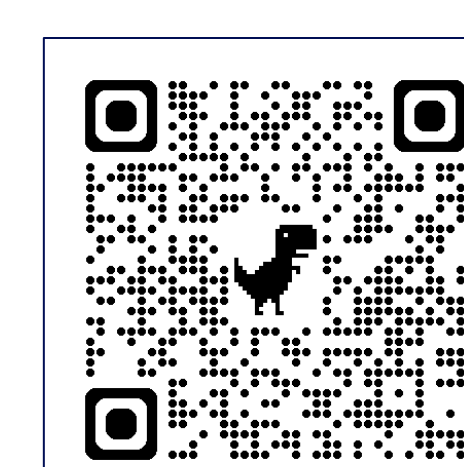
Therefore, the app can be trusted and relied upon as a dedicated service for campus safety at present.

REFERENCES



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If you are interested in my research or me, visit my personal website. You can check my CV, previous projects, things I have done before.

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