Project Overview

"Bush Telegraph" is the Australian country term for the informal network which spreads news ... through a region of rural or outback Australia.
https://en.wikipedia.org/wiki/Bush_Telegraph

We propose developing a digital "Bush Telegraph" system that will support sharing of knowledge within the community and to visitors of local road closures and similar incidents with the objective of improving community communication, and being better prepared to navigate future natural disasters.

We note that while our proposal was formulated prior to the 28-Oct-2020 release of the report from the Australian Federal Royal Commission into National Natural Disaster Arrangements, our proposal does provide a simple, flexible, community sourced solution to a key problem identified in the report findings - that there should be real-time information systems to inform the public about road closures and openings (see Recommendations 9.2 & 9.3). Our solution to this problem involves quick and automatic dissemination of 'crowd-sourced' road closure / incident information which has the advantage of speed and flexibility to cover even the smallest roads within isolated communities. Of course it would be possible to augment our proposal with input from government agencies on official road closures.

Finally we note that the digital system will be developed with sufficient flexibility that other similar rural communities will be able to take advantage of the functionality if they find it useful.

Project Summary Specification

This proposed Bush-Telegraph digital system would be implemented professionally, interfaced via iphone, Android phone, or PC, connecting to map and time stamped data stored in the cloud. The initial userbase would be members of the Megalong Valley community but would be available to any interested visitor to the Megalong, and also to other communities elsewhere in NSW.

This digital effort in the Megalong Valley has become viable with the recent activation of a new Telstra phone tower that now provides mobile service coverage to the majority of the valley.

The primary function of the app can be separated into three components

1) Entering Incident data. Specific data items include:
* geo-coordinates (of phone at time of entry, automatically generated)
* manually entered geo-coordinates of the incident (if different from phone calculated geo-coordinates)
* manually entered category (tree fall, road accident, flood, other)
* manually entered estimated time to resolution (hours, days)
* manually entered descriptive notes (required for 'Other' category, otherwise optional)
* timestamp (automatically generated

This entry function would be limited to registered users, entering data from phone calculated geo-coordinates within the Megalong Valley*. Immediately on Incident data entry, the data would be uploaded to the cloud and a push notification would be broadcast to all Megalong Valley* users.

2) Incident review - at any time (though logically post receipt of an incident notification). When a user opens the phone app, they will see a map view of all the incidents current (within the estimated time to resolution since the incident original time stamp) in the area. The incidents will be marked by an icon overlay on the map (icon corresponding to the incident category). On tapping any icon, the screen will display any additional available information (estimated remaining time to resolution, any descriptive notes). It will be also possible to view historical incidents in a list view, in reverse chronological order to highlight most recent incidents at the top.

This review function would be available to all app users.

3) Editing Incident data. To the user who made an incident report (and administrators), they would be able to subsequently add additional information to their descriptive notes and revise the estimated time to resolution. The edit function may be accessible by clicking on the incident or going into a table view of incidents they entered.

This edit function would be limited to users who had entered data on a current incident (and only permissioned to edit their own posts), as well as administrators.

A secondary function of the app will be to support user registration, available to all app users (subject to their phone being within the bounds of the Megalong Valley*). While the app will be available at no charge from both the Apple iOS App Store and Android Google Play Apps, and as noted above all app users would be able to receive push notifications and review incidents, to get permission to enter new incident data the app user would need to register the app with a phone number. To register, the user would go into the setup screen on their app and press the 'Register' button. If the phone detected it was outside the bounds of the Megalong Valley* geographical area, it would block registration and state that registration is only available from within the Megalong Valley. Assuming this condition was met, the app would prompt the user to enter their mobile phone number (& optionally their name). The system would then send a confirmation code text message to that phone number. The user would enter the confirmation number back in the app to complete registration. To support possible future use of the system by communities in other areas, the app may allow selection of the "Locality" of interest, which would then be associated with the registration*.

A tertiary function of the app, available to all users, will be to display a page of NSW emergency services web-page links & phone numbers such as:
* RFS
* SES
* Ambulance
* Police

User Categorisation

It is expected that there will be 4 categories of users:
* System Administrators - able to define Localities and assign Locality Administration privileges. Access via web-portal.
* Locality Administrators - able to edit Locality registered user black lists (keyed off mobile phone number, though these will not be displayed to administrators), and to deregister users from their Locality who are judged to abuse the system with inappropriate data entries. Also able to reject or correct data entries. Access via web-portal.
* Registered Users - granted access to input data within a given Locality. Access via phone app.
* Others - only able to view incident information. Access via phone app.

Security

The system is deliberately specified to collect only the minimum sufficient data on users. Many users would supply no personally identifiable information. For users who participated in the crowd-sourcing of incident information, the only additional item they need provide is their mobile phone number - no name required. The only purpose of requiring a phone number is to provide a strong mechanism for blocking input access to any user who attempts to abuse the system.

The input of information from a registered user will be end to end encrypted to prevent spamming of end-users.

Administrator web-portal access will be controlled using 2-factor authentication and will be presented via secure HTTPS protocol.

Specific Components

Cloud data storage and processing (eg AWS)

Web portal - for System administration including
* Specification of Locality including name and polygon boundary geo-coordinates
* Management of Locality administrator privilege (associated with name, email address and mobile phone number).

Web portal - for Locality administration including
* the community access list and phone book
* reports:
  - of new data entries
  - listing users / mobile phone numbers
  - listing basic usage stats
  - listing stats on incidents by type, road, date range, duration band,...
* screen to edit or reject data entries
* communication with (Locality) community via phone app msg, and or text community with update information or news (subject to each individual end-user approval).

Android phone app (available for all users) - for viewing information and optionally input of new location / incident information

Apple iOS phone app (available for all users) - for viewing information and optionally input of new location / incident information

Google mapping interface (visible in portal and phone apps)

Once implemented with funds from the initial grant, it is proposed that ongoing modest maintenance and support costs would be funded by the Megalong Valley Community and Landowners Association.

* Megalong Valley boundaries would be a pre-specified area characterised by polygon geo-coordinates. This "Locality" of Interest would be potentially one of any number set up in the system and available to end-users as a setting choice in their phones.