



## **Comparative A/B testing a mobile data acquisition app for hydrogeochemistry**

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In the context of a larger study on the Capricorn Orogen of Western Australia, the CSIRO Mineral Discovery Program is conducting a regional study of the hydrogeochemistry on water from agricultural and other bores. Over time, the sampling process was standardised and a form for capturing metadata and data from initial measurements was developed.

In 2014 an extensive technology review was conducted with an aim to automate field data acquisition process. A prototype hydrogeochemistry data capture form was implemented as a mobile application for Windows Mobile devices. This version of the software was a standalone application with an interface to export data as CSV files.

A second candidate version of the hydrogeochemistry data capture form was implemented as an Android mobile application in the FAIMS framework. FAIMS is a framework for mobile field data capture, originally developed by at the University of New South Wales for archaeological field data collection. A benefit of the FAIMS application was the ability to associate photographs taken with the device's embedded camera with the captured data. FAIMS also allows networked collaboration within a field team, using the mobile applications as asynchronous rich clients. The network infrastructure can be installed in the field ("FAIMS in a Box") to supply data synchronisation, backup and transfer. This aspect will be tested in the next field season. A benefit of the FAIMS application was the ability to associate photographs taken with the device's embedded camera with the captured data.

Having two data capture applications available allowed us to conduct an A/B test, comparing two different implementations for the same task. Both applications were trialed in the field by different field crews and user feedback will be used to improve the usability of the app for the next field season. A key learning was that the ergonomics of the app is at paramount importance to gain the user acceptance. This extends from general fit with the standard procedures used in the field during data acquisition to self-descriptive and intuitive user interface features well aligned with the workflows and sequence of actions performed by a user that ultimately contributes to the implementation of a Collect-As-You-Go approach. In the Australian outback, issues such as absence of network connectivity, heat and sun glare may challenge the utility of tablet based applications in the field.

Due to limitations of tablet use in the field we also consider the use of smart pens for data capture. A smart pen application based on Anoto forms and software by Formidable will be tested in the next field season.