NRDC Quality Assurance Application

Team 9 - Ragnarok

University of Nevada, Reno, 1664 N. Virginia St., Reno, NV 89557

CSE

Abstract

The NRDC QA Application is a cross-platform mobile and web application. It works as a generalized, user-facing tool for recording metadata, but with a more specific goal of aiding NEXUS site technicians for better efficiency in the field. The technician enters metadata into a local database through the dynamically generated UI. The data is then sent to a remote database when an online connection is available. This application is meant to replace the current process that has NEXUS site technicians physically recording data in notebooks before transferring it to a central database.

Main Goals

When setting out to develop this project, there was a consensus of target objectives that needed to be satisfied. Helping facilitate data science replicability is our most important goal. Recording metadata allows data scientists to monitor important information about how a scientific process has been conducted. Another goal was to replace the current process of data recording from laborious pen and paper, to a seamlessly connected metadata management tool. Lastly, researching how ontologies work and implementing it into our project.

Features

Some major features implemented in our project:
- Offline/Online functionality
- Light/Dark color themes
- Dynamic Navigation
- Dynamic Add, Edit and View instances
- Record and Upload photos
- Login Authentication
- Data Validation

Architecture

The high level architecture of our application (as seen in Figure 1) starts by authenticating the user with a login service. Once authenticated, the application will retrieve the hierarchy from a FLASK server which has parsed an ontology into interpretable JSON. This JSON is used to dynamically generate a hierarchical navigation menu on the front end. Figure 2 shows how it also describes which data fields are necessary in the data entry and view pages. Once the fields are known, the application retrieves the metadata from the database and populates the hierarchy dynamically with names as well as the view and edit pages with the completed data. The application also allows the user to add new metadata objects using the correct fields.
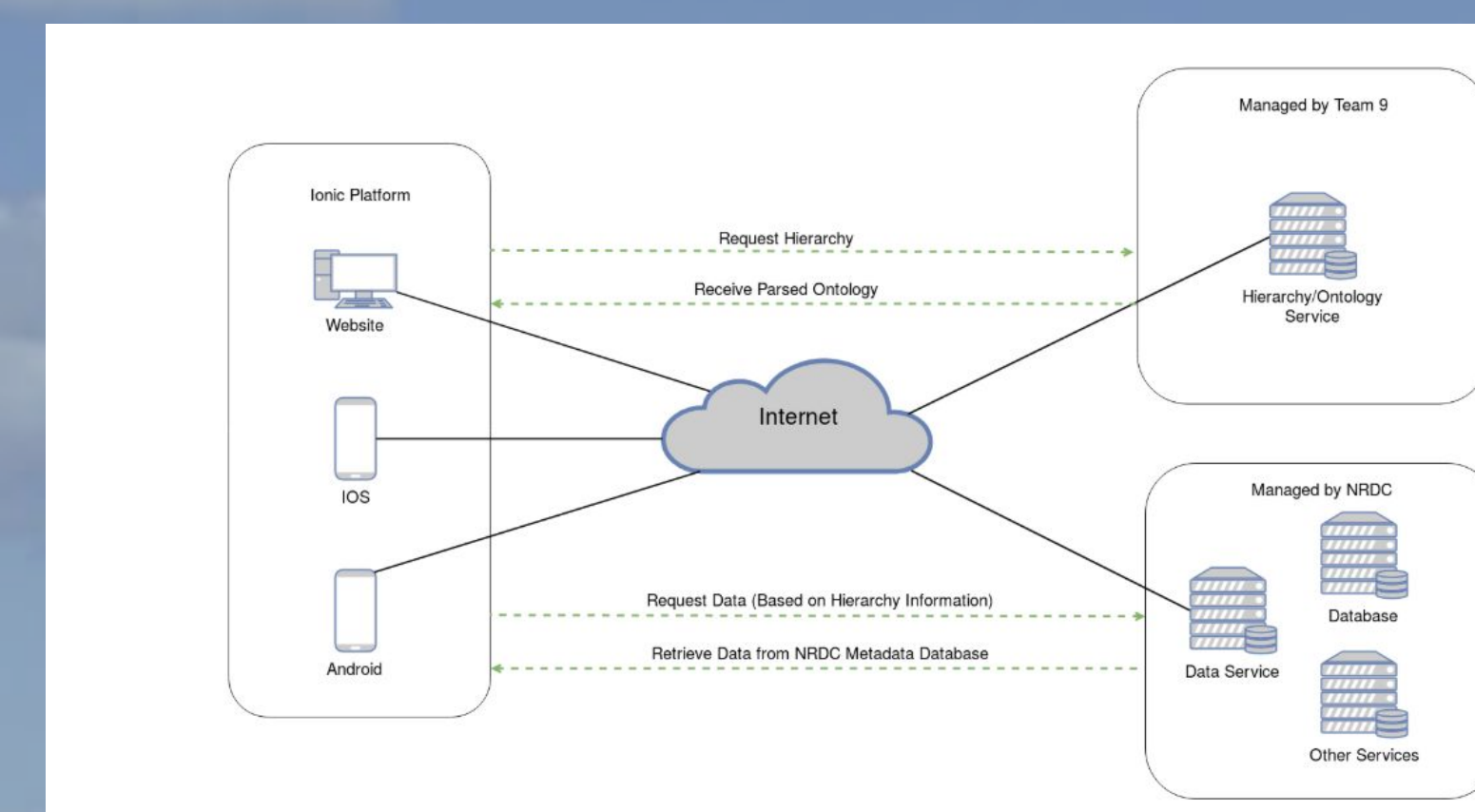
High Level Design

Fig 1. High level architecture.
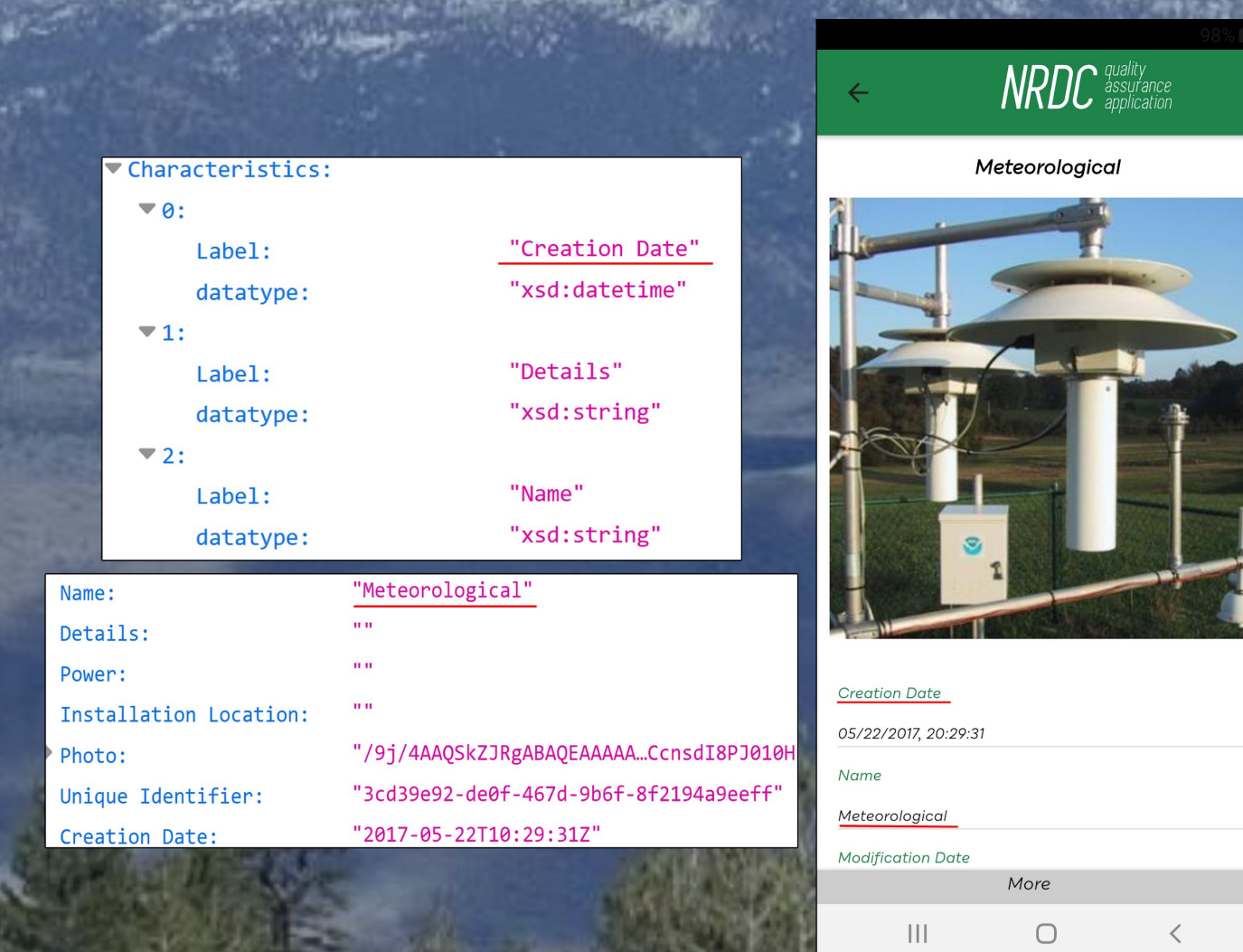
Dynamic User Interface

Fig 2. Dynamic hierarchy and metadata visualization.

Future Work

In the future we would like to do several things. First, we would like to develop the ontology and application to handle thesaurus capability. In other words, there will be synonyms for different fields that have the same or similar meaning. Second, we would like to incorporate data grouping. Data grouping would be a method in which similar data fields can be combined based on a mutual quality, such as a latitude and longitude being characteristics of GPS coordinates. Finally, we would like to be able to include documents such as word and pdf files in our database, as well as the capability to view and upload them through our application.

Conclusion

The NRDC Quality Assurance application is developed as an open source alternative for Nexus site technicians and the current problems they face in the field. It will also allow data scientists to dynamically create their own metadata management tool by using an ontology that represents the information they wish to include. Team 9 has spent countless hours, working together to research and develop all features discussed. They would like to thank you for taking the time to give our hard work a look.

For further information, please visit our website:
http://ragnarok.antilectual.com
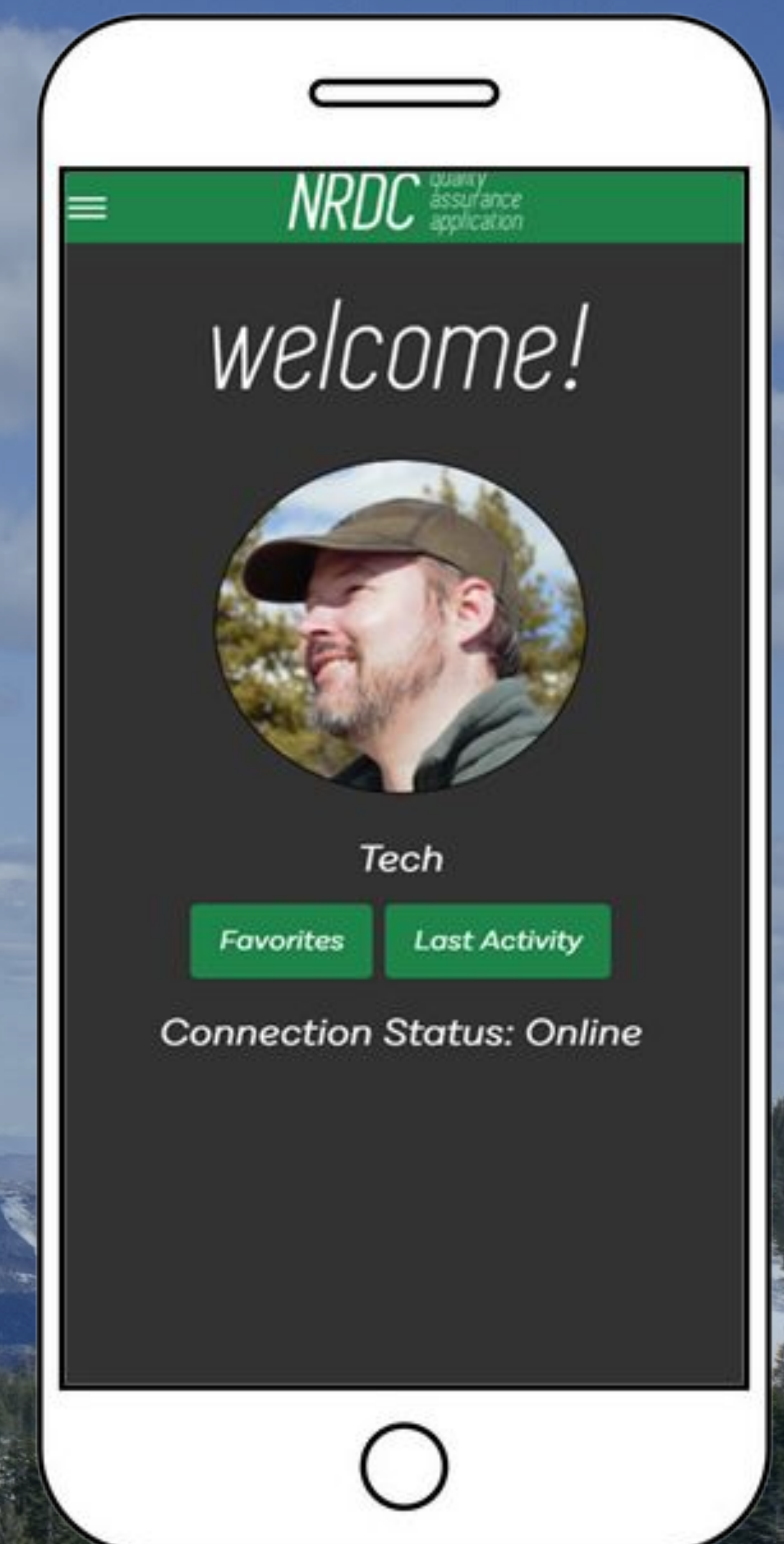
*This project was developed in Spring 2019 as part of the course CS 426 Senior Projects in Computer Science.

NRDC quality assurance application

welcome!

Tech

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Connection Status: Online

Nicholas Jordy

Matthew Johnson

Christopher Eichstedt

Brianna Blain-Castelli