NASCIO 2017 Improving State Operations

1. **Title: Utah's Watershed Restoration Initiative**

2. **Category: Improving State Operations**

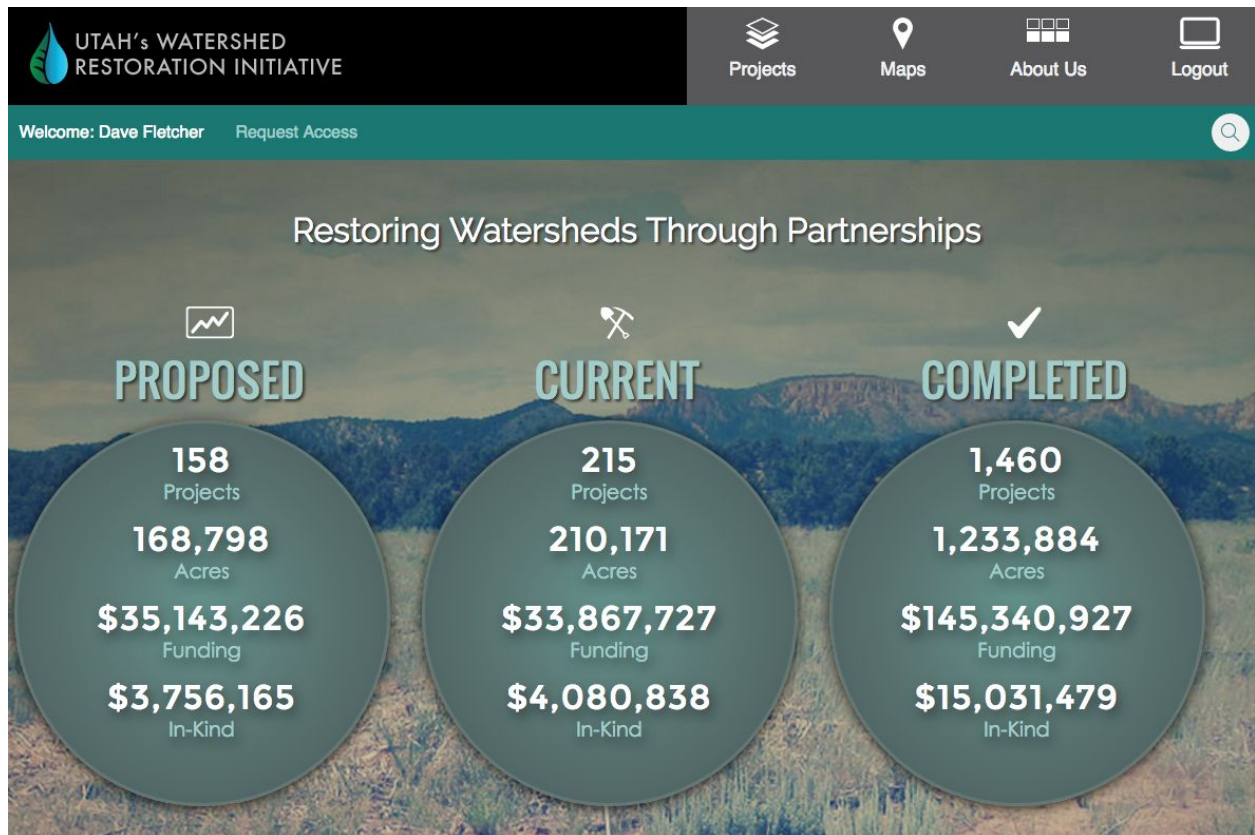3. **Project Initiation and completion date: September 2015`**

Project Website: wri.utah.gov

4. **Organization and primary point of contact**
Organization(s): Utah Department of Natural Resources & Utah Department of Technology Services
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Executive Summary

In September 2015, the Department of Technology Services, in collaboration with the Utah Water Restoration Initiative completed a new mobile responsive, web-based application to facilitate online management of hundreds of projects from proposal to completion for hundreds of diverse participants. A GIS-based interface makes it easy to locate and access individual projects as well as compare each project with projects which may overlap or neighbor the selected location.

The Watershed Restoration Initiative (WRI) is a partnership based program in Utah to improve high priority watersheds throughout the state. WRI is sponsored by the Utah Partners for Conservation and Development and is in its 11th year. The Watershed Program focuses on three ecosystem values: 1) wildlife and biological diversity, 2) water quality and yield, and 3) opportunities for sustainable uses of natural resources. WRI is a bottom-up initiative where project planning, review, and ranking occur at a local level. Five regional teams elect their own leaders, establish focus areas, review,score and rank project proposals using a comprehensive project prioritization score sheet, and assist their members in implementing projects. All of these processes are facilitated and improved through the new app.

In State Fiscal Year 2015, 122 agencies, organizations and individuals participated in projects in the WRI database through funding, project management, technical assistance or in-kind services. WRI through its partners provides a number of project services including: funding, assistance with project planning and implementation, contracting and accounting, seed purchasing, storage, mixing and delivery, free use of restoration equipment, project monitoring and reporting, project management, and an online project database. The locally-led teams provide a means to work on a landscape scale across ownership boundaries.

Through April 2017, WRI projects have exceeded 1.3 million acres treated in Utah. Projects can generally be categorized into two types, restoration projects to improve the health of watersheds and rehabilitation projects following wildfire to re-establish the structure and function of watersheds.

The new site took 10 months to develop and is much easier to navigate than the previous one. Users are able to extract data and generate their own reports on the new system.

Concept

The Watershed Restoration Initiative (WRI) web app is the official channel for submitting, reviewing, funding and tracking an array of wildland restoration projects throughout the State. The original application was built over 7-years ago using technologies that, over time, began to limit the usability of the application and proved to be increasingly difficult to maintain. The WRI business team requested a full rebuild of the underlying database and back end systems in addition to a complete refresh of the front end application and web site. The goals for the new application were: a) continue as single point for online submission of project proposals; b) improve the end-user's experience; c) improve security through secure coding practices and use of stronger roles; c) broaden utilization among partners and public; d) improve the query and extraction of tabular and geographic data related to projects; and e) design and build a robust, flexible system which continues to be maintainable as technology changes. Overall, the goal is an application which will continue to be functional and usable for the foreseeable future.

Business solution description

The WRI application is a replacement for the old application and it's associated web site. The goal of the rewrite was to improve user workflow for proposing projects by using new technology, and to improve public access to the WRI projects database. WRI utilizes a consolidated database housing both tabular and GIS based data. Data from the old database was cleaned up and migrated to the new database allowing users to see and review the history of WRI projects tracked by the database. The team updated and refreshed the static content of the database with a content management system simplifying the update and posting of new content. The development team designed and built a simple interface for uploading and managing additional documents and videos to supplement and augment a project. The GIS team developed a simple set of tools allowing the end-user proposing and or updating a project to use the web interface to create and edit polygons and geographical features. The combined development and GIS team designed and built an advanced search system allowing users to do adhoc data query and reporting of project data. The development and GIS team designed a process enabling end user's authenticated data along with key pointers to pass securely between major application components. The end user only needs to authenticate once regardless of their entry point into the system. All major components of the system utilize the same theme and style sheets. The end-result is an application that appears and functions for it's users as a single seamless application.
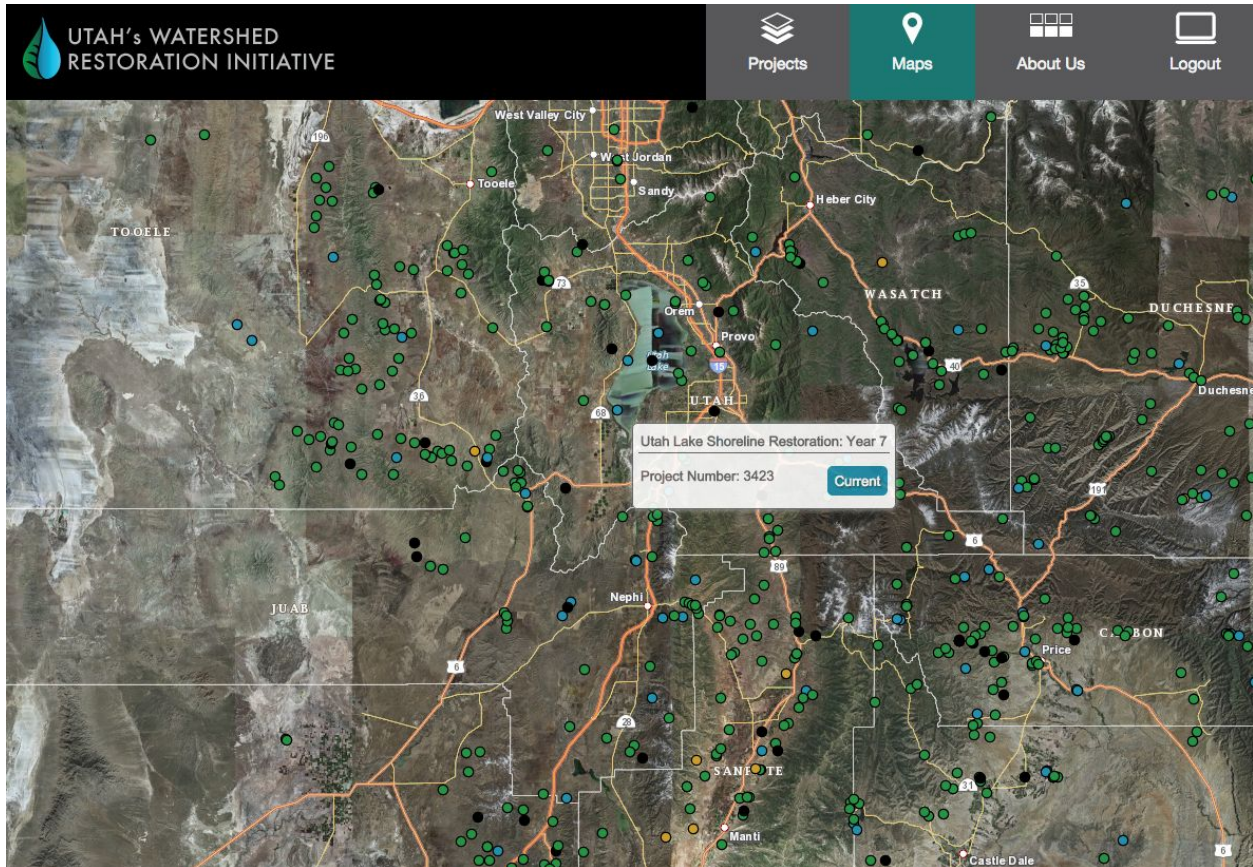
The WRI web system utilizes a combination of Java and Javascript for tabular functionality (web forms and reports), .Net and ESRI ArcGIS services for all GIS functions including mapping and editing of project GIS information, WordPress for content management. WRI utilizes a consolidated MS/SQL database housing both tabular and GIS based data. The updated system takes advantage of the strengths of Linux based virtual machines to keep costs for running the application lower, while the costs of the .NET and GIS functions are offset by combining the databases into a single database.

There are three distinct populations of application users. Project managers must obtain a user account, which gives them write-access to enter new proposals, edit all projects associated with their account, and comment on other proposals. Program administrators manage user accounts, project statuses and categories, project funding and expenditure information, and database domain values. Public users may view, query and download all project data.

The application serves as the sole method of submitting proposals for funding for restoration projects. There are hundreds of active user accounts, which has grown

along with the partnership over the past decade. In recent years, there may have been 40-50 users submitting proposals for themselves and others in their agency or office. This was directly related to the familiarity of a user with the former application, which was not as intuitive as the new system. In the current funding cycle, 115 different users have submitted between one and twelve proposals, for a total of 276 new proposals. Furthermore, the advanced search and download functions have increased use among typical users, but also partner agency managers and analysts, and the public.

Significance

The new Water Restoration Initiative application has enabled the Initiative to achieve new levels of success by providing a solution that is easy to use, accessible, and scalable to meet the needs of a very diverse customer base. It was able to address these needs within budget constraints that would have stopped many similar initiatives from achieving success.

- By leveraging the internet and various open-source technologies the cost remained low.
- Effective implementation of a GIS-based interface enhance the usability in the field as well as the ability to understand the impacts of adjoining and overlapping projects while providing a means to collaborate between related projects.
- Creating the service with responsive design enabled a mobile cross-platform environment that is critical for working in the field environment associated with these projects.

All of this has led to better collaboration and improved focus on the initiative's primary goal which is improving critical watersheds in a desert state where it makes a real difference.

The application is hosted on DTS' private cloud
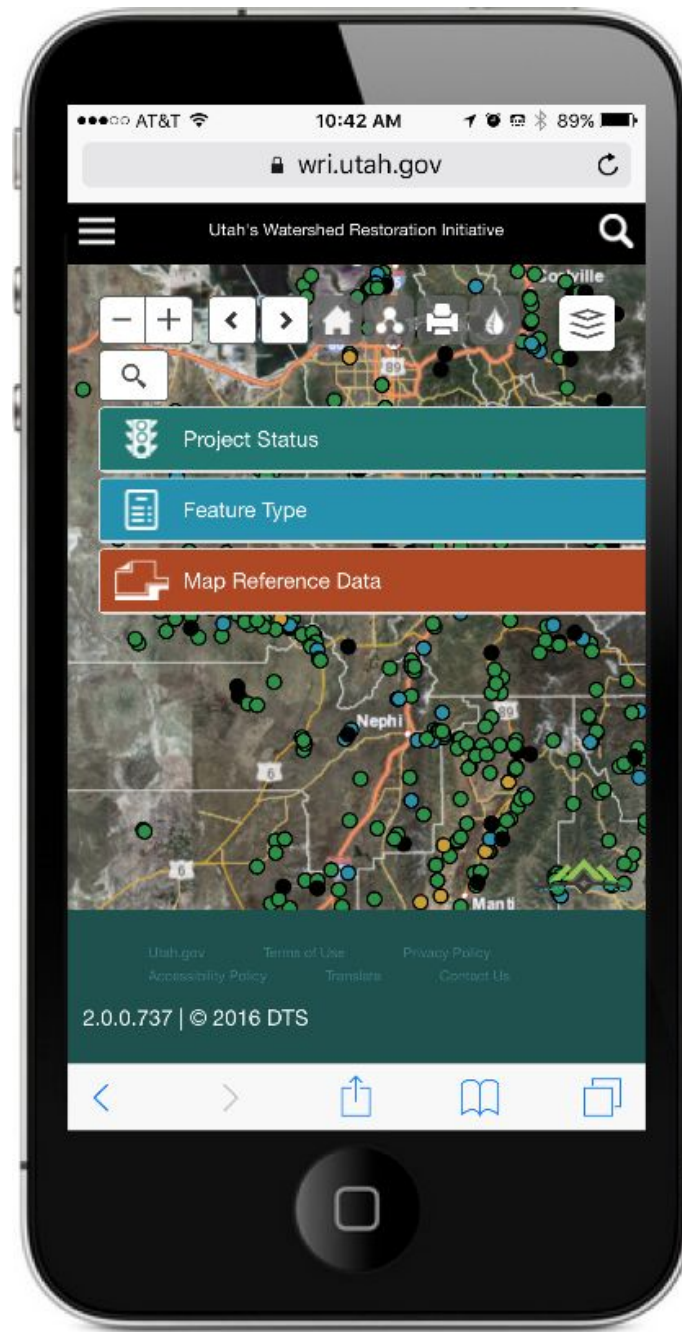
platform, which is a cost effective, transformative platform built on virtualized, self-provisioned Intel architecture. Over 85% of the DTS server farm is virtual and can be provisioned in real time.

Impact

Benefit to government

The new WRI application has already had a significant impact on overall participation in the program. The number of proposals went from 40-50 in the old environment to 276 in just the first year. By providing the data in a visual format, users were able to gain a better understanding of other work that was happening in their specific geographic region as well as around the state.

The number of applicants also increased. The easy to use interface, along with increased accessibility from your platform of choice was a feature that invited greater participation.

- Better collaboration among WRI participants
- Universal access via a simple-to-use web interface
- Improved understanding of available data
- Use of open source and other technologies to reduce cost

After the application's launch, in-depth training occurred at meetings of each of the five WRI regional teams, which consist of the individuals that submit proposals. Demonstrations of the system have also been given to partner agency and organization management in meetings and presentations. Since the application also serves as a platform for presentation of projects during the proposal review phase, it has been used in peer-review meetings, and meetings with potential funding entities. It was highlighted at an annual GIS open-house at the Utah State Capitol during the 2016 state legislative session. It has also been highlighted on the Utah Division of Wildlife Resources' Twitter account, on the Utah Department of Technology website, on the Utah Automated Geographic Reference Center's website, and in various online newsletters within the landscape restoration community.

The largest benefits resulting from this project are associated with improved management of the watersheds encompassed in the 1.3 million acre portfolio managed through projects supported by the system. Prior to implementation, there were fewer projects requested and managed due to staffing and support limitations. The system has provided increased visibility into the process and reduced barriers that were inhibiting collaboration and participation.

That said, there are some quantifiable benefits resulting from the way that the new system was developed and implemented.

Cost benefit estimates

The following table identifies some of the savings achieved through moving IT service management and other services to a single cloud platform.

Component	Benefit (Onetime)	Benefit (Ongoing)
Use of Open Source	$14,000	$2,500
DTS Private Cloud Platform	9,575	1,900
Improved Process Management		36,000
Agile Development	35,500	600
End user reporting & data mgmt. efficiencies		59,340
Total	**58,575**	**99,340**

Best practices employed
- Collaborative Management
- Hosted in the cloud
- Integration of GIS and Product Management with mobile service delivery
- Responsive web design
- Open data

Every state has similar IT service delivery processes and requirements. Successful implementation of cloud IT service management in Utah can serve as a model of how to effectively leverage the cloud to improve the way IT services are delivered in state government. This project can serve as a model for how GIS-based project portfolios can be better managed through effective use of online and mobile technologies.

NASCIO Priorities

Utah Watershed Restoration Initiative supports the following NASCIO priorities: Cloud Services, Data Analytics, Budget and Cost Control, Agile and Incremental Software Delivery