# RECLAMATION
*Managing Water in the West*

# Report of Findings for Lower Colorado Region Engineering Services Office FY15 Project Management Software Market Research

**Research and Development Office**
**Science and Technology Program**
**Final Report (1619)**

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# Mission Statements

The U.S. Department of the Interior protects and manages the Nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

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## Executive Summary

Reclamation's Lower Colorado Region Engineering Services Office (ESO) has been a leader in accomplishing complex projects throughout the western United States for organizations within and outside the Federal government. This success is built on ESO's efficient management of a budget from multiple funding sources of up to $34 million annually. This substantial budget, coupled with the scheduling and performance tracking of over 200 projects per year, can present challenges to the ESO goal of ensuring its customers get quality services within critical timeframes.

The current ESO project financial tracking system has evolved from a single database into a complex network of interrelated Excel spreadsheets (Project Management Excel Tool). Unfortunately, the system does not provide sufficient functionality to meet existing mission requirements. Thus, ESO embarked on a search for improved project and portfolio management software.

The steps in this effort were to build a project team, develop software requirements, conduct market research on the internet, evaluate products of several companies, and recommend software options that would later be evaluated and tested to ensure the recommended product can meet critical requirements.

This report summarizes the findings and recommendations of the market research in Fiscal Year 2015.


## Background

ESO is a full cost recovery fee-for-service (FFS) organization that provides design, technical, and construction services to Reclamation and other federal agencies upon request. ESO actively manages approximately 200 projects having a cumulative value of over $30 million. Services provided include project management, engineering analysis and assessments, special engineering studies, field investigations, field surveying, field and design data, designs, specifications, cost estimating, pre-award contracting technical activities, and construction inspection and testing, up to and through commissioning, acceptance and operation. The success of projects completed by the office requires efficient cost tracking, scheduling and integrated change management control.

The Project Management Excel Tool employed by ESO to accomplish project tracking/portfolio management involves multiple Excel spreadsheets, many of which are interlinked and contain complex formulas to derive statistics needed to monitor each project's status. This multiple-spreadsheet approach has the potential to introduce errors, as a single break in one of the

formulas or links can propagate into other dependent cells and/or worksheets, resulting in incorrect calculations and invalid conclusions. These errors, when they occur, can be difficult, time consuming and costly to find.  The ESO Project Management Excel Tool requires that staff devote a considerable amount of time and attention to ensure project status information is accurate.


**Market Research**

In FY15, ESO received $20,000 in S&T funding to perform initial market research of available solutions to streamline ESO's current project-tracking and portfolio management processes.

As a first step, the Principal Investigator assembled a team of ESO staff members (Project Team) that conducted research on various portfolio management software and existing systems.  The Project Team consisted of a Portfolio Manager, Deputy Regional Engineer, Project Engineer, Portfolio, Project, and Business Management Group Chief and a Deputy Manager from outside of ESO.  The Project Team selected software for assessment by conducting in-depth internet research, telephone inquiries to customers and companies, and evaluating current Reclamation systems.

The Project Team also evaluated several critical requirements for the Project Management Software.  A matrix (attached) was developed listing these critical requirements to determine if the evaluated software could meet ESO's needs. One requirement that eliminated several software packages was that they only offer cloud- or internet-based solutions which are not desired due to IT response below:

> All cloud computing products or services, must be certified through the Federal Government via FedRAMP (www.fedramp.gov).  This certification process takes approximately one year…  Once a vendor or service provider has been FedRAMP certified then each agency (DOI in our case) must then have the vendor or service provider submit for an agency certification in order for DOI to utilize them.  This agency certification can take up to approximately one year, so in essence it takes a total of 2 years for a vendor or service provider to have an ability to provide us with cloud products and/or services.  Please also take note, not every vendor or service provider will receive a DOI certification.

Instead of analyzing cloud-based software, the selected packages for analysis were web based or locally installed on a server, and met several of the following requirements:

   A)  Provide back-up and security capabilities

B) Ability to have custom reports created and/or create custom reports internally
C) Generate a simple initial Service Agreement or Charter to initiate work on a new project
D) Allow for development of a formal Service Agreement or PMP
E) Allow for development of contract and non-contract cost estimates
F) Ability to generate a gantt chart
G) Offer electronic signatures (preference)
H) Ability to create Change Orders that clearly define the changes
I) Maintain version control of each agreement
J) Generate monthly project report to track against latest approved agreement and include features of:
   - % complete
   - Earned Value (EV)
   - Current financials
   - Schedule Performance Index (SPI)
   - Cost Performance Index (CPI)
   - Project status notes, signature, and date (manual entry)
K) Ability to import financials from the Financial and Business Management System (FBMS)
L) Ability to upload and attach significant project documents and photos (preference)
M) Ability to view a dash board of all projects and generate a summary output report of:
   - Projects related to each Stakeholder
   - Projects administered under each Manager
   - Projects status for analysis and end of year Coordination and Oversight Group (COG) reporting
N) Provide ability to generate completion reports and lessons learned
O) Lock and archive project records

Other considerations in evaluating the software were whether:

P) Handle projects with multiple financial account numbers (WBSs)
Q) A WBS can be reused for a project during a later period or fiscal year
R) The company provides good customer service

Lastly at the bottom of the matrix, the Project Team estimated the approximate cost in terms of evaluation and testing of each potential software package:

S) Labor (including acquisition (AAMO) costs)

T) Annual Licenses or upfront cost
U) Testing and Evaluation
V) Customization costs
W) Training and Implementation
X) Annual maintenance

## Findings

As a result of this market research, ESO has identified nine software packages or development options that potentially could meet several of ESO's project-tracking and portfolio management needs:

- Reclamation's Technical Services Center's (TSC) Custom Software
- Reclamation's Mid-Pacific Region's (MP) Project Management System
- Mavenlink
- Clarizen
- Team Headquarters
- BOE/EV Max
- FBMS Project Management Module
- Enhance ESO's current Project Management Excel Tool
- Custom software

After meeting with TSC, MP and members of Reclamation's Project Management Oversite Team (PMOT), the Project Team learned that:
- TSC's Access database is not transferable to the LC Region because it was built in Access and the LC Region has decided not to use Access in the future; the programmer working on it was about to retire so modifications could not be made; it did not meet most of ESO's requirements; and it would not be maintainable in the future.
- MP uses a program called ESAM, similar to ESO and the TSC, however it is too simplistic and does adequately meet ESO's needs such as detailed cost estimating, electronic signatures, and Monthly Project Report tracking. However these needs could be met if the ESAM Project Manager had available resources and time to make the modifications. At the moment this is not an option, however it could become an option at some future point in time.
- The PMOT is also looking for tools to improve the efficiency and effectiveness of project management by automating processes, and had identified software to test, including the FBMS project management module and Microsoft project professional and server. Both of those tools have potential to meet project needs.

After demonstrations were provided by the software companies Mavenlink, Clarizen and Team Headquarters, it was determined that they could only meet a few of our requirements, but not the most essential requirements of cost estimate development or dashboard reports (see Matrix for more details).

The Project Team researched additional solutions and found BOE/EV Max. BOE/EV Max would meet most of ESO's requirements and future customization could satisfy the majority of the remaining requirements (see attached matrix).

Another potential consideration was the FBMS Project Management Module that will be developed within Reclamation through coordination with the PMOT for testing in Fiscal Year 2016 and 2017. As this is a Reclamation-wide test it would be essentially free for ESO, presents long-term savings, and should eliminate financial errors because it will be incorporated directly into the financial system.

Another option is to enhance ESO's current Project Management Excel Tool with advanced macros and formulas to link to the FBMS financial reports and prevent broken links to the monthly project reports. This option was added after finding that so few commercially available software packages would meet our needs. The Excel Tool started looking more desirable because it meets at lot of ESO's requirements (see attached matrix), the office is proficient at using it, it is relatively easy to create custom reports, and it is relatively inexpensive.

Lastly the Project Team found that building custom software is the one option that could meet all of ESO's requirements (plus preferences), could be formatted similar to ESO's current and highly preferred reports, would greatly reduce training time, since it could follow ESO's current process, and it could reduce contract costs since the scope of work is very clear, concise and some of the programming language may already be available.

These findings and supporting data are summarized on the Requirements Matrix in the Appendix.


## Recommendations

Based on the above findings, ESO recommends testing and evaluation in FY16 of the following options:

- BOE/EV Max
- FBMS Project Management Module
- ESO's current Project Management Excel Tool
- Custom Project Management software such as:
    - Electronic Service Agreement Module (ESAM)
    - ESO Database

If funding is secured in FY16, it would be requested that the Project Team:

- Buy one BOE/EV Max license for testing and evaluating against ESO's needs.

- Participate in testing the Project Management Module in FBMS and evaluate its applicability for meeting ESO's needs.

- Enhance the Excel Project Management Tool Set to eliminate prior concerns of financial errors and broken links to monthly status reports, as well as link to MS Project to meet more requirements such as offering a Gantt chart.

- Test and evaluate custom software such as ESAM and ESO's Database as an example of what custom software can provide. It is also possible that either software could be modified and/or enhanced.

- Coordinate with PMOT to identify other software packages with cross regional applications and evaluate packages that meet a broad spectrum of Reclamation's Project Management requirements.

# Appendix

## Requirements Matrix