Environmental Data Flow
Six Sigma Process Improvement
Savings Overview

LA-UR-15-23766

Background

- **Scope**: The Environmental Data Flow Six Sigma improvement project covers LANL's environmental data processing following receipt from the analytical laboratories.

- **Initiated**: September 2009.

- **Driver**: Cost-benefit on data validation conducted in mid-2009 showed potential for improvement.

- Phases:
  - Phase 1 – 10/1/09 to 2/1/12
  - Six Sigma Yellow Belt - February 2012.

Note - The costs savings associated with Phase I and the Yellow Belt Six Sigma improvements are reported together in this document.

Improvements

The Six Sigma project identified thirty-three process improvements, broken into seven subgroups:

1. Implementing cloud computing,

2. Restructuring the data stewards' jobs,

3. Eliminating redundant data reviews,

4. Implementing change control on the system,

5. Incorporating google maps,

6. Implementing automatic electronic validation (auto-validation) of the analytical data, and

7. Mapping the data process.

Improvements - Notes

- Six of the improvements were never implemented.

- Two of the seven improvement subgroups (restructuring the data stewards' jobs and mapping out the data process) did not lead to any cost savings but did lead to more accurate sample planning and increased transparency into the system.

- One subgroup (implementing change control) had savings that could not be quantifiably separated from the cloud computing subgroup savings, so all savings from that subgroup are rolled into the cloud computing savings.

- The remaining four subgroups of improvements resulted in the savings documented here.

Assumptions

- Savings are reported for the four improvement subgroups.

- Savings from the Phase 1 improvement occurred during the time period of 10/1/09 to 2/1/12. After 2/1/12, any savings from the Phase 1 improvement were convolved with the improvement subgroup for auto-validation and accounted for in those savings totals.

- Other than the Phase 1 savings, all savings reported cover the cumulative six year period of FY10 through the end of FY15.

- The cost savings reported in this summary were validated through February 1, 2014. All savings reported beyond that point are projected estimates.

Non-monetary Improvements

Data Delivery to Users - 98 % decrease in time for users!

- Significant reduction in the length of time required to deliver data to clients/users.

- Prior to the improvements, the median time period to deliver data to clients was on the order of 50-60 days, depending upon the client, with an uncertainty of 15-30 days.

- The improvements reduced that time to 1 day (98% decrease) with an uncertainty of 1 day. These time savings constitute non-monetary savings.

Phase 1 Savings

- **Approach** - Phase 1 savings were calculated by evaluating the percentage of time saved by modifications to data validation. That percentage was then applied to an actual invoice for a known quantity of validated request numbers, giving a dollars saved per analytical request figure. That savings was applied to the actual number of analytical requests that flowed through the system from 10/1/09 when Phase 1 was implemented to 2/1/12 when auto-validation absorbed the process.

- **Total Phase 1 Savings** - **$1,000,000.**

Auto-validation Savings

- **Approach** – Similar to Phase 1 approach, a total cost of validation per analytical request was obtained from invoice data as well as additional labor costs. Dollars saved per analytical request were obtained and savings were calculated by applying that to the actual volume of analytical requests flowing through the system from 2/1/12 when auto-validation was implemented to 2/1/14, the date of this cost validation report.

  - Savings for FY14 and FY15 were interpolated based on estimates of flow through the system.

- **Total actual and interpolated savings - $2,500,000**.

Cloud Computing Savings

- **Approach** - Implementation of cloud-based computing was associated with sixteen individual improvements. Actual savings associated with cloud computing were calculated by determining the average annual cost of running our previous databases from 1/1/09 through 12/31/10. Initial costs to implement the cloud system and ongoing costs to maintain the cloud system were subtracted.

- **Total Savings** - **$10,000,000**

Data Review and Map Production Savings

- **Approach** - Savings from eliminating redundant data reviews and producing maps individually were calculated from the salaries of the staff performing these tasks.

- **Total savings** - **$1,100,000**.

Change Control - Non-monetary Savings

- The cost to run the databases prior to implementation of cloud-based computing was reduced by the implementation of a Change Control Board.

- The Board authorizes changes to the database that benefit many customers, are cost effective, and fit within the limited budget allowed for improvements.

- This improvement allows the database to continue to meet customer needs despite funding levels.

- There were no direct monetary savings.

Savings Summary

Overall, for the six year period from the beginning of FY10 through the end of FY15, the validated actual and interpolated savings from the seven process improvement groups of the Environmental Data Flow Process Improvement was calculated at **$14.6 million**.

For More Information

Nita Patel

Project Manager

Los Alamos National Laboratory

505-665-9273

npatel@lanl.gov