Process Improvement: "Successfully designed or re-engineered a program"

Name of new program: **Texas A&M University Agrilife Inspection Report System (AIRS)**

Reason for selection of problem

The Agrilife Safety division within Texas A&M University Environmental Health and Safety Office (EHS) is responsible for ensuring safe research practices that are compliant with state and federal regulations and best practices across the thirty-one geographically dispersed research and extension centers and research stations operated by the Texas A&M Agrilife Research agency.

Inspections at each of the thirty-one facilities are performed annually by Agrilife Safety personnel and cover fire and life safety, laboratory safety, occupational safety, agricultural safety, and environmental compliance. The inspections may take multiple days per facility and the data sets collected for each inspection are extensive and include images of each deficiency with a grade assigned for its severity.

While the inspection process is currently running as efficiently as possible with the implementation of electronic data capture, generating reports for each facility proves difficult to accomplish quickly given the robust inspection schedule and limited note taking capabilities within the data capture software. Each inspector would review the data in the standardized non-customizable output the data collection system provided and then reformat by hand into the report format accepted by stakeholders while only including the data of interest. This

process of review, data culling, and reformatting would take eight (8) hours up to several days to complete depending on the length of the inspection report. The Agrilife Inspection Report System (AIRS) was created to streamline the report generation and formatting process.

Cost of implementation

The cost of implementation was limited to the time and effort of two full-time EHS employees. Development took approximately one month before the launch of the first version. The software was authored as VBA modules and functions within Microsoft Excel and, as Excel is already a tool available to all EHS personnel, its purchase price is not included as a production cost.

Method of implementation

A software application, named Agrilife Inspection Report System (AIRS), was developed in Microsoft Excel using the visual basic for applications (VBA) code language. Excel-based VBA was chosen since the data collection software in use by EHS exports data as a formatted Excel file. AIRS supports all of the fire and life safety, laboratory safety, occupational safety, agricultural safety, and environmental compliance data collected and generates reports based upon the requirements of the Agrilife agency's stakeholders. Additionally, placing the Excel-based AIRS on the EHS cloud drive enables the creation of a master record of each year's inspection data and analyses. Year-to-year comparisons can now be run for trending and EHS program auditing purposes.

Cost effectiveness

The inspection and report generation process was completed for the two TAMU facilities in El Paso and Socorro, TX in 2017 and 2018. El Paso and Socorro, TX are average in size and scope when compared to the remainder of the facilities inspected. In 2017, the process of generating the inspection reports and sending them to the responsible parties took two persons a total of 3-4 business days. In 2018, this same task took approximately four hours. Comparing the same two facilities inspected with the same process between the two years results in a report generation and delivery time reduction of 83%. The time savings as a result of using the AIRS program has greatly improved the service that the Agrilife Safety division of the EHS office provides to stakeholders.

Aside from the directly measurable improvements within the EHS department is a more difficult to quantify benefit of being able to provide reports to the inspected departments much more quickly. A faster turnaround in delivering the inspection reports to the departments gives faster notice of any safety deficiencies needing correction and could allow for a more rapid response to safety issues.

Total time savings for all thirty-one facilities is calculated using the El Paso and Socorro, TX data, which is reasonable given their average size and scope. Using the most conservative 3 business-days reduced to 4 hours for a savings of 20 business-hours, as described above, results in a total time savings of approximately 620 person-hours per year and thus, when including an average hourly rate of the inspectors, approximately $14,614 per year.

Scope of program

The scope was to develop an automated solution for the tedious and single person-dependent report process of the EHS Agrilife Safety division inspection program. Automating the entire data processing/culling methodology and report generation has reduced the time required to complete this process from what took several days, to only a few hours. AIRS imports, pre-processes the inspection data, and generates easily editable reports that can then be saved or exported as a PDF. The reports can be sorted by the dates of inspection (multiple inspections can be included), and by building. Additionally, the reports can be generated in preparation for institutional audit and will include a summary report of all rooms in which no deficiencies were noted for completeness.

The report generation routine was customized to meet the Texas A&M Agrilife Research agency stakeholders' requirements so that the information presented is of maximum value. The reports are output as a worksheet in Excel which makes them easily editable prior to using the "save to PDF" function native to Excel. The Excel report outputs also include formatting elements such as section headers and color separations for ease of reading.

By automating those functions that required specialized knowledge of the individual EHS staff member who performed the inspection, the technical knowledge and familiarity with the inspection data collected is no longer a barrier to wide-spread use or regeneration of any report for past inspection. Standardizing the method in which the data is processed for the reports

also improves data integrity given elimination of personal style variances from user to user. The information is always presented in the same way and can be cross-compared to any other inspection report. Additionally, with use instructions included on the AIRS home screen, anyone within the EHS office can now easily perform the functions previously restricted to a single individual thus ensuring the future sustainability of the process.

Flexibility of the program to be adapted at other institutions

There is no barrier to wide-spread adoption of AIRS so long as each adopting institution makes use of the same data collection method (iForms). The data collection form in use by the Agrilife Safety division of TAMU EHS may be shared across institutional accounts and thus any instance of AIRS will be prepared to properly handle the data and generate reports with the same quality as at Texas A&M. Minor customizations are easily made by anyone with Excel VBA coding experience.