

California Department of Food & Agriculture
Office of Information Technology Services

Leafy Green Inspection Tracking System

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Executive Summary

In late 2006, an *Escherichia coli* (*E. coli*) outbreak associated with spinach threatened to shut down a large part of California's agriculture industry. This threat to a \$32 billion industry led Governor Arnold Schwarzenegger to push for increased government oversight of food safety systems within the leafy greens industry. The California Department of Food and Agriculture (CDFA), working with the farmers, shippers and producers of leafy greens, established the California Leafy Greens Marketing Agreement (LGMA), creating a mechanism for mandatory government inspections and ensuring compliance with established food safety practices.

"California farmers of leafy greens products, like lettuce and spinach, have the force of law behind them through these government agencies to ensure the food safety practices are enforced," said California's Secretary of Agriculture AG Kawamura. He added that the LGMA represents a public/private partnership with a common goal to protect public health. "The government provides third-party program oversight and conducts all inspections, while the cost of these inspections is paid for through industry assessments. The system is an efficient utilization of resources during these times of severe budget constraints."

Secretary Kawamura also noted the LGMA has become a model for programs in other states and that a national leafy greens marketing agreement is being considered by the United States Department of Agriculture (USDA).

Per Governor Schwarzenegger's 2006 resolution to protect the public health and safety of consumers, the leafy green industry in California increased its effort to minimize the possible contamination by food-borne pathogens through participation in the compliance verification project. The CDFA initiated the development of the Leafy Green Inspection Tracking System (LGITS) which would serve the 112 handlers and vendors that service approximately 99 percent of California's leafy green market.

The LGITS was implemented in May 2008 as a unique and innovative public/private partnership project that utilizes business process management to transform the way that California schedules, captures, stores, tracks, and disseminates information of leafy green audits performed by the CDFA to ensure compliance with USDA food safety practices.

"We've heard a lot of talk recently about the need for mandatory government oversight of food safety systems within the food industry," said Joe Pezzini, a leafy green farmer and chairman of the California Leafy Greens Marketing Agreement Board. "What few realize is that a system to provide government inspection of food safety systems already exists for California leafy greens. We have Governor Schwarzenegger to thank for establishing this unprecedented program to protect public health."

Description of the Business Problem and Solution

Operating Business Problems

Throughout the growing season, more than 112 handlers and 300 growers must be audited multiple times to ensure that they are in compliance with food and safety practices accepted by the California Leafy Green Products Handler Marketing Agreement. The program, only in existence for one year prior to the LGITS implementation, had already recognized the following operating business problems:

- The lack of a scheduling tool for supervisors and auditors led to some growers being over-audited while others were not being audited at all.
- Audits were being transcribed to electronic documents that required e-mail and fax for transmittal.
- There was no way to track status of an audit or review historical audits electronically.
- Findings reports had to be re-formatted from the CDFA standard to the LGMA standard in order to communicate issues to handlers.
- Handlers had to create separate documents to establish corrective action plans.
- Workflow was a manual process.
- There was no capability to track verification audits and follow up activities electronically.
- Business relationships between handlers and growers could not be tracked efficiently or easily.
- The disconnected process limited CDFA's ability to protect California's agricultural industry and public health.

Solution

The CDFA selected an enterprise based Modified-Off-The-Shelf (MOTS) application that is architected to run on a Microsoft SQL Server database utilizing a back-end Java application service running on Tomcat. This is a web-based browser that supports multiple browsing compatibilities (IE 8, Firefox, etc.). The application is a web-based software product that does not rely on any proprietary extensions within the supported server environment.

The CDFA has further secured the application by ensuring connections are encrypted by SSL using a digital certificate utilizing the HTTPS protocol. Moreover, the application is easily configured and maintained. The benefit of this solution to the CDFA is the ability to configure the installation with the screens, fields, and rules that represent the Leafy Greens business needs, including, allowing supervisors to measure how often a handler is audited and providing automated workflow between the CDFA, LGMA, USDA, and handlers.

Governance

The LG Working Group, which met weekly, included key managers and staff. The LG Steering Committee, which met monthly, consisted of the Division of Inspection Services Management Team, the LGMA representatives, the Central IT Management team and the Consultants. Additionally, the CDFA procured the services of an external consultant to perform independent oversight and risk management. This consultant met with Chris Cruz, the CDFA Agency Information Officer and Executive Sponsor, to provide project status reports and to escalate any issues or risks that required resolution beyond the project manager and team.

Project Management

The state had both an IT Director and a business Project Manager that worked together. The team applied the PMI methodologies for managing this project. The Project Manager ensured that all tasks and deliverables were completed on time and maintained communication with project team members throughout the effort.

The project was executed using a methodology where everything was driven by “Business Processes.” The input to the custom development team was the processes addressed and validated in the “To Be” document. The workflow process divided all processes that exist in the project scope into unique processes, sub-processes within those processes, and activities within those sub-processes. The entire implementation project took four months.

Communication

Crucial to the success of a project that coordinates between such disparate interests is communication. The LG Steering committee held monthly meetings to ensure strong communication between Executive Management, the LG Working Group, LGMA, and the consultants. Internal project team communication was a vital component throughout the project lifecycle. In addition to weekly project team meetings, the team members used project collaboration through emails and direct person-to-person contact to monitor project status and to view tasks and assignments. This form of communication provided a means to resolve issues or concerns promptly and also served as a repository for important documents in a library that could be accessed by all team members. This strong communication plan ensured that all stakeholders felt ownership of the solution. The communication plan also included user training on the application, which was provided by the consultants and LGMA.

LGITS has succeeded in removing or mitigating the many operating business problems in a very short time-frame. LGITS was launched in May 2008. The LGITS application has the following features/functionality.

LGITS features include:

- Re-engineered audit checklist and the data capture process.
- Scheduling is electronic and minimizes duplicate/missed audits.
- GIS data can be captured for each audit.

- Workflow manages and tracks all activities of the CDFA, FDA, USDA, LGMA and handlers.
- Users can access the system from any web-enabled internet browser on a roles basis through a single point.
- State users can enter time and expense data.
- All records are centrally stored.
- Changes to the system are done through a Graphical Users Interface and not at the code level.

LGITS System Functionality:

- Audit data entry is managed through an edit process guided by users.
- Workflow is static and driven by business rules.
- Screens are roles-based and provide security for workflow and viewing.
- Enterprise tool that allows multiple instances with one installation.
- Users can attach documents, images and corrective action plans (CAP) to each audit record, which are then stored in the system.
- Auditors can add handlers and growers, and manage relationships.

Significance

Prior to LGITS, the leafy green audit process relied heavily on the auditors to transcribe field findings to electronic form, and communicate those findings to multiple stakeholders utilizing fax and email. Some growers were audited multiple times in a short period while others were not audited enough. Stakeholders had no ability to view the status of an audit electronically or understand what inputs were being made to findings and corrective action plans. Final findings were stored in electronic and paper form in multiple locations.

This solution completely reengineered the process, improving the auditors' verification checklist, automation of workflow and ensuring that time tables are met, providing complete transparency to the progress of an audit, scheduling audits based on history and providing electronic notifications as process steps are completed.

The result has reduced the process time of an audit from a week to 24 hours. All stakeholders can view all information in real-time as it is entered; handlers can enter responses to findings electronically and attach supporting information; the USDA can view audits at their discretion; and time and expense is captured in the same interface for reimbursement. All audits are entered into the system in their entirety and are accessible centrally for reporting and historical analysis, including attachments such as documents and images.

LGITS has:

- Transformed the complete business process lifecycle of how data is collected, stored, and disseminated.

- Created a transparent operating environment where federal, state and industry stakeholders have continuous access to critical data.

LGITS benefits multiple stakeholders. It provides a uniform method for the CDFA to conduct, manage, track, and store audits and associated documents. It provides LGMA with transparency into audits and status of findings for both the CDFA and handlers (over 112 volunteer signatories) allowing them to interact with LGMA and the CDFA through an automated workflow. The FDA can view audit information without having to wait. And the reengineered process improves relationships and enhances transparency of the audit environment. The relationships of over 300 growers with their handlers(s) are facilitated by placing the responsibilities for best handling practices with the handlers' authority and subsequent deployment with the growers. USDA benefits by monitoring and participating in the State project.

The system is the most comprehensive set of information available on actual food safety practices being conducted in the field by allowing public and private sector user groups throughout the state to enter audit findings, track audit status, respond to audit findings, and utilize historical data in conducting analysis. There were 641 audits entered between April 2008 and March 2009 versus 424 the previous eight months, which followed the completed workflow path that included review by LGMA, the handler, and USDA.

Four separate stakeholders utilize this system. Two of the stakeholders in the public sector include the CDFA auditors, inspectors, supervisors, and management and USDA users. Private sector users include the LGMA users and about 120 handlers (such as Fresh Express, Fresh Choice Marketing, Dole Fresh Vegetables, and many others). The system currently supports more than 400 total users statewide. Use is restricted to the LGMA staff; CDFA auditors, inspectors, supervisors, and management; and handlers (signatories).

Benefit of the Project (LGMA Annual Reports 2007/08 and 2008/09)

The utilization of this tool directly supports the CDFA's strategic enterprise plan to reduce the number of silo applications and is consistent with the State Chief Information Officer's Strategic Plan to facilitate collaboration that breeds better solutions, utilizes information as an asset and self-governance in the digital age. This tool is also in alignment with NASCIO priorities of promoting transparency, shared services, security, budget and cost control and governance. The solution meets security goals outlined in the NASCIO strategic plan and "IT as reliable as a utility" goals in the California IT Strategic Plan, as it is inherently stable and secure in its workflow and data access methods. The use of a MOTS tool provides the CDFA with the ability to solve enterprise-wide data capture system needs through the use of a single product. The implementation of such an enterprise tool eliminates stove-pipe solutions and focuses support to enterprise applications rather than multiple, division specific applications.

The (LGITS) exemplifies the achievement of both strategic collaboration goals and tactical financial goals that meet NASCIO's Strategic Goals and the goals of the State CIO. As examples, the LGMA Annual Report 2008 to 2010 showcases the following benefits:

- Provides the ability to meet the objective to audit every handler-member of the LGMA at least four times per year and to audit every grower at least once and calibrates. inspector performance to ensure uniformity among all auditors and audits
- Improves speed to reimburse program expenses, as time and expense reporting is rules driven and allows for export of data into the CDFA accounting system.
- Reduces multiple manual, paper-based processes and allows industry to understand which practices are proving most difficult in which to achieve compliance so that efforts can be made to improve the compliance rate.
- Accelerates the review of audits from weeks to days by eliminating duplicate data entry efforts which increases the accuracy, validity, audit capability, and approval of all submissions and by improving the capabilities for analysis and decision making. The result has reduced the process time of an audit from a week to 24 hours.
- Increases the ability to track offenders and issue corrective action by improving access to data for the CDFA staff, LGMA staff, USDA, and other industry stakeholders.

Additionally, LGITS has helped the State of California and key partners generate new levels of cost reduction, performance improvement and return on investment. Examples from the 2008-09 report include:

- Over 641 audits were conducted from April 2008 to March 2009 at a cost of \$1,853,547 versus 424 audits for the previous eight months at a cost of \$2,068,458.
- Flagrant Violations and Major Deviations were reduced by 80 percent.
- Improved field audits increased non-citation Minor Deviations from 331 to 796, Minor Infractions from 204 to 235 and general Citations from 585 to 1,068.
- The Return on Investment (ROI) of this product (approximately \$117,000 for one time implementation costs with contract costs totaling approximately \$262,000; current annual maintenance and licenses upgrades costs are estimated at \$249,500 over five years compared to unspecified but estimated to be millions of dollars in manual audit costs over the same time period).

Overall, the CDFA is achieving its mission to meet the many needs of the food and agricultural industries, including the needs of growers, handlers, processors, and regulatory agencies. This solution helps users understand every issue and assists with the documentation of compliance of regulations to ensure that growers and handlers deliver fresh, safe products to customers.