# Internet Unemployment System

2015 NASCIO State IT Recognition Award Nomination

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| Project: | Internet Unemployment System (iUS) |
| Category: | Improving State Operations |
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| State: | Idaho |
| Project Initiation: | December 2011 |
| Project Completion: | September 2014 |

IDAHO DEPARTMENT OF LABOR

## Executive Summary

Idaho Department of Labor (IDOL) is the state government agency tasked with administering the unemployment insurance program for collection of taxes from employers and disbursement of benefits to claimants.

Idaho has operated its unemployment insurance program on legacy mainframe computer systems that were built for tax in 1976 and for benefits in 1983. For nearly 40 years, IDOL relied on these systems written in outdated programming languages and without relational databases. They were difficult to support and cumbersome to change.

A long history of federally mandated changes to the unemployment program complicated by an ever-increasing number of employers and claimants resulted in the proliferation of mainframe data miscalculations, ineffective tax collection processes, improper benefit payments and insufficient data validation processes.

IDOL employees across multiple work units used these legacy mainframe systems to perform manual, time-intensive processes that were prone to inaccuracy.

The mainframe systems were costly to operate at more than $1 million per year for processing charges and software licenses, which does not take into account staff and development costs. Furthermore, the mainframe provider planned to shut down mainframe services at the end of 2014. To keep the systems running thereafter, the agency would incur ongoing costs that would increase exponentially.

Idaho's solution for unemployment insurance legacy mainframe systems modernization was to replace existing mainframe functionality with the Internet Unemployment System (iUS), a web-based application built using an agile development method and new technology. Idaho budgeted $10 million for the iUS project: a fraction of the $50 million to $150 million that other states have budgeted for similar modernization endeavors.

After three years in development, on Sept. 15, 2014, the team delivered iUS: a fully functional web-based solution that surpassed expectations. iUS was deployed on time, under budget and with no significant impediments. iUS uses a modern object-oriented development language, a model-view-controller software architecture pattern, relational database technology and was designed to run in a virtual server web farm environment.

As a web-based system developed, supported and maintained by IDOL, iUS has significantly reduced annual agency operating costs on multiple fronts. iUS has eliminated outside mainframe software licensing costs and has already saved several thousand hours in labor annually across various agency bureaus and work units.

Job functions have been repurposed dramatically for many IDOL employees. Instead of fighting outdated systems that hindered job activities with manually intensive workflows, staff use iUS to perform job duties more productively. They can also rely on the accuracy of the new web-based system and its real-time responsiveness to improve the customer service experience they provide employers and claimants.

## Business Problem and Solution

Idaho Department of Labor's complex and mission-critical mainframe systems were built to accommodate the significantly lower unemployment volumes of the 1970s. However, through the decades these numbers increased substantially. Currently the agency collects state unemployment tax funds from more than 49,000 employers and manages unemployment benefit claims for more than 55,000 claimants.

Another ongoing problem faced by Idaho and other states: the extensive federally mandated changes made to the unemployment program over 40 years. These changes required advanced processes and calculations that were impossible to implement correctly in legacy systems.

An ever-increasing number of employers and claimants in the unemployment program complicated by a long history of frequent unemployment program changes caused perpetual mainframe data miscalculation, ineffective tax collection processes, improper benefit payments and insufficient data validation processes.

IDOL employees were required to use the legacy mainframe systems to perform inefficient, inaccurate manual processes. For many tasks, IDOL employees were required to monitor the mainframe systems and data entry was performed over several days. After calculations were manually tracked on hand-keyed spreadsheets, staff often retraced steps already taken and reentered data as common, recurring inaccuracies arose.

By 2008, it had become clear that legacy systems modernization was required for the unemployment insurance program to continue effectively. Since several states had failed in similar modernization attempts, this high-risk endeavor was not taken lightly.

In 2009, IDOL joined a U.S. Department of Labor funded project to determine the feasibility of building a modernized, multiple-state unemployment system that would meet the needs of four states concurrently: Arizona, Wyoming, Idaho and North Dakota. Dubbed AWIN, this consortium project led to a comprehensive analysis of the problem space and a thorough requirements-gathering process. After the project ended in 2011, each state was well prepared to determine the best approach for modernization.

Idaho's solution for unemployment insurance legacy mainframe systems modernization was to replace existing mainframe functionality with the Internet Unemployment System (iUS), a new web-based application developed, supported and maintained by IDOL.

The scope of the iUS project was clearly defined from project initiation: eliminate the obsolete mainframe technology by replacing it with a web-based system that could be updated easily as required federal changes occurred and scale easily as unemployment volumes increased over time.

Moreover, the agency's mainframe provider had scheduled a discontinuation of mainframe systems services at the end of December 2014. If a replacement system was not in place by the planned shut off date, the agency would pay an exorbitant monthly charge to keep the legacy systems running thereafter. Therefore, a hard target date was established and all development work had to be completed within three years.

IDOL assembled a cross-functional team comprised of business analysts, subject matter experts, software developers, testers, a technical writer and project managers in both business and IT development. While a combination of in-house staff and contractors have worked on the team, the iUS project is entirely under the agency's jurisdiction.

Agile development techniques and Scrum methodology were used to optimize development activities, to ensure the most important and highest risk work was completed early and to avoid unnecessary overhead.

An early proof-of-concept sprint was completed to vet technology choices and document patterns and practices in the iUS Playbook. This provided consistency and structure for the development team in a fast-moving agile project. Continuous improvement built into the Scrum process helped the team refine and improve processes and methods throughout all phases of the project's lifecycle.

Nine months before the iUS rollout, communication with agency wide stakeholders began when an iUS Project SharePoint page was created and the first of a monthly iUS project newsletter was written. Communication included a development status, a training schedule for each work unit, an iUS deployment timeline and a list of interface applications that required integration testing prior to the iUS rollout.

An assortment of technical training materials and user guides were created for each user community and made available six months before iUS was released. Business experts on the iUS team provided training to all agency work units to ensure that on day one of iUS employees were well prepared to assist claimants and employers.

On Sept. 15, 2014, the team of highly dedicated individuals deployed iUS, Idaho's new web-based core unemployment system for tax and benefits. iUS was released as anticipated: on time, under budget and with no unresolvable impediments.

Architecturally, iUS is a multi-tiered application built with simple interfaces that seamlessly integrate with existing applications. Created using current technology, iUS can be easily maintained and enhanced. iUS was written in an object-oriented development language (C#.Net) using modern coding practices. iUS uses the model-view-controller architecture pattern and relational database technology (MS SQL Server). The iUS system data have been redesigned and normalized. Data are structured and organized in a manner that provide simple and effective ad-hoc reporting without IT support.

The system relies heavily on customizable configurations and control tables. This allows authorized employees to update business logic dynamically without the need for developers. The system uses functional modules, libraries and web services. Being run in a Microsoft Hyper-V virtual server IIS web farm means that iUS is easily scalable for increased loads without requiring special hardware.

iUS was intentionally designed to be hardware independent. By using off-the-shelf hardware, IDOL can use the most cost-effective hardware at any point in time.

The overall framework makes transferability of iUS to other states possible.

## Significance of the Project

In an environment where state agencies are charged with the promotion of responsible government, budgets and financial accountability are important. Continuous improvement through lean operation is an ongoing top priority of IDOL executive management. Upgrading the technology used by state employees to the iUS web-based system provides a strong foundation on which IDOL can stand as a state agency that is run efficiently and effectively.

Having a legacy mainframe system as the core unemployment system is a common problem nationwide. Other states have taken up to 10 years and spent $50 million to $150 million on similar modernization projects. Up to now, these deployments have failed to replace the legacy system or have achieved only a partial replacement.

Yet, Idaho budgeted $10 million for iUS and upon the project's completion had a fully functioning web-based system that came in well under budget at $7 million. Additionally, iUS was deployed three months ahead of schedule, well before the three-year deadline.

Idaho is groundbreaking in its successful adoption of iUS for its unemployment program work while epitomizing the goal of many states: complete liberation from obsolete mainframe technology at a low cost and in a short timeframe.

Many units within IDOL use iUS to perform a variety of work. iUS saves several thousand hours in labor per year on a plethora of fronts. System automation has replaced numerous time-intensive, manual processes with a few easy button clicks and key strokes. iUS is a more accurate system coded with business rules that prevent data entry error on claimant and employer accounts. iUS automatically generates employer and claimant notifications instead of staff manually writing, printing and mailing letters by hand on a daily basis.

iUS pays unemployment benefits on time, has decreased the occurrence of improper benefit payments, has increased detection of fraudulent activities, and uses web services for all applications on the Interstate Connection Network (ICON). iUS calculates taxes more accurately, easily generates federal unemployment tax certifications in batches, and uses system automation for processes such as the annual experience rating calculations, tax accounting batch processing and tax accounting data validation.

iUS helps Idaho employers and unemployed claimants alike. Web-based applications that interface with iUS provide simple self-service account maintenance for employers and claimants. Employers and claimants are alerted to important account changes through system-generated notifications that use templates containing understandable language and accurate account details. Employers and claimants also enjoy the benefit of speaking to IDOL employees who can access account information with real-time updates, perform ad-hoc data queries and resolve issues more quickly.

The significance of iUS reaches far beyond Idaho's unemployment insurance program. Idaho is the lead state in a consortium of states working to modify iUS for use in other states. The consortium's goal is to drastically reduce the cost and complexity of modernizing unemployment insurance systems across the United States.

## Benefits of the Project

Deployed in September 2014 with virtually no startup problems, iUS functions superbly as Idaho's core unemployment tax and benefits system. As anticipated, IDOL was liberated from outdated technology when the mainframe was unplugged in December 2014.

The stakeholders who have benefited from the successful launch of iUS include not only IDOL employees working a wide range of job scopes, but employers taxed for unemployment and claimants who draw weekly unemployment benefits. iUS has processed unemployment insurance payments on schedule since day one.

iUS successfully handled some of the heaviest tax and benefits workload seasons with ease. During its first eight months in production, iUS processed more than 142,000 employer quarterly tax reports, collected $143 million in tax payments, filed more than 67,000 new unemployment benefit claims and paid claimants $81 million in benefits.

iUS processed 14,000 initial benefit claims filed during the highest volume month to date just as easily as it processed 5,800 initial benefit claims filed during the lowest volume month to date. Similarly, iUS managed 44,000 quarterly reports filed during the highest volume month to date as effortlessly as it managed 1,300 quarterly reports filed during the lowest volume month to date.

iUS has significantly reduced annual agency operating costs. By eliminating mainframe technology, iUS has saved IDOL $100,000 per month, which comes to roughly $1.2 million saved annually. This included controller costs associated with mainframe software licensing, technical support and the mainframe lease.

Numerous manual processes have been automated in iUS. This has reduced the number of hours IDOL employees spend performing daily tasks while increasing data accuracy. A prime example: annual experience rating computation and assignment of rate classes that previously took up to 2,000 hours to calculate by hand. Now calculated through automation, fewer than 40 hours are spent and that is mostly on verification. This has proven to be a more accurate and effective process.

Other tax processes that now use system automation include employer acquisitions, experience rate transfers, tax accounting batches, wage entry and correction, money accumulators, tax refunds, electronic fund transfers, civil penalties, professional employer organization management, cost reimbursement reconciliation and identification of debtors eligible for liens.

System automation for the benefits user community can be seen in areas such as new claim processing, monetary determinations, rolling base periods, continued claim processing, benefit payments, issue adjudication, overpayments identification, appeals, employer charging and claim extensions.

With iUS, Idaho became the first state to interface fully with the Interstate Connection Network (ICON) via web services. Idaho created a Local Hub that preprocesses data exchanged with other states and checks for validity before use on a benefits claim.

iUS generates accounting vouchers accurately with daily balancing and validation. The mainframe systems never balanced and required constant adjustments. The result was balancing within three percent of actual tax revenue and benefit expenditures. That difference approaches what auditors call “material” and was simply not acceptable. The goal with iUS is to balance perfectly.

Balanced accounting data in iUS has taken previously high call volume time-periods and reduced them to times of virtually no call volume. A great example: using mainframe technology thousands of inaccurate 1099-Gs meant high claimant call volumes, with hundreds of calls handled by management. Conversely, of the 55,000 1099-Gs generated by iUS for 2014, only one was corrected due to inaccurate mainframe conversion data and only one call was sent to upper management.

Training new and existing state employees has become a simpler task with elimination of unintelligible green screens containing cryptic codes and no labels. The web-based design of iUS uses a format more familiar to staff with simple English labels on screens.

Real-time updates displayed on screen make account maintenance a simpler, quicker process. Previously a single task took multiple steps and had to be completed over several days because changes were not available to view on mainframe screens until nightly processing had occurred. Staff monitored the system, manually tracked totals on hand-keyed spreadsheets and fixed common, recurrent problems. Real-time updates on iUS screens allow staff to see changes immediately. There are no recurring problems to fix because the iUS data can be trusted as accurate.

A number of IDOL work units now have follow-up queues that contain pending tasks. This ensures that any unresolved activity on a claimant or employer account is identified and completed. The follow-up queues have eliminated staff-managed spreadsheets and reduced the occurrence of data entry errors.

A variety of user and management reports are available in iUS. The reports provide quick accurate views of workload counts, performance statistics and system operations. Reams of paper are saved by no longer printing reports for storage in filing cabinets.

With system-generated letters that use notification templates, efficiency has increased across the tax and benefits user communities. Instead of staff writing, printing and mailing letters by hand, iUS automatically generates letters. In its first eight months, iUS generated more than 141,000 tax letters and more than 251,000 benefits letters.

The forward-thinking architecture established with iUS has provided the opportunity for IDOL to develop additional interface applications and iUS enhancements. These development activities have further advanced the agency’s modernization scope. Included are the Employer Portal account management system, Liens filing and management system, Tax Accounting Bank Cash reconciliation with employer account transactions, Tax Accounting Journal Vouchers for tracing and vouching between tax and fund accounts, and Wage Entry rewrite for simplified workflow and improved accuracy.

iUS has been labeled by industry experts as one of the most successful deployments of a modernized unemployment insurance system in the nation.