Nomination Form

Title of Nomination: Long Term Care Regulatory Web Accessible Facility EnRollment (WAFER)
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Texas Department of Human Services
Long Term Care Regulatory (LTCR) Web Accessible Facility EnRollment (WAFER)

Executive Summary

Long Term Care Regulatory (LTCR) is a program within the Texas Department of Human Services (DHS) that provides federal certification for health care facilities participating in the Medicaid and Medicare programs, state licensure for facilities providing licensed health care services, and licensure of home and community support services agencies that provide home health, personal assistance, and hospice services. Provider facilities served through the program include hospital skilled-care units, nursing facilities and convalescent centers, assisted living facilities, homes and state institutions for the mentally retarded, and adult day care centers. Provider agencies served through the program include those that provide home health services, home dialysis, hospice services, and personal assistance services.

Services provided by LTCR are divided into three key functions: facility enrollment, compliance review, and customer service. The facility enrollment function primarily encompasses license and certification application processing to initially operate and continue operations legally in the State of Texas. Information collected and maintained include provider demographics, initial and renewal applications, licensing and certification, primary ownership and ownership hierarchies, fee payment, and sanctions. The compliance review function involves facilitating ongoing compliance of providers with state requirements in the form of regular surveys as well as responding to escalated complaints either sourcing from the customer service group or from complaints made to regional offices. Survey and complaint functions include citing of deficiencies, appropriate recommendations, assessment of penalties and sanctions, as well as tracking of abuse, neglect, and exploitation (ANE) cases. The customer service function focuses on complaint intake, resolution, and escalation activities based on severity of complaints related to long term care facilities.

The LTCR WAFER application entails all activities involved with the processing of licensing and certification applications of provider facilities, and the tracking of their status until a determination to approve or reject the application is made. This process selects from ten application forms that facilitate an appropriate combination of the 500 total business rules and dependencies. The applicable business rules and type of information collected also vary based on the type of provider facility whose application is being processed from one of the five categories of providers regulated by LTCR. LTCR staff must ensure completeness of the information provided in the application, request providers clarify missing or incorrect information, conduct background checks, perform compliance review, issue licenses, and finally, enroll the facility. Processing of the application involves various roles and responsibilities facilitated using a workflow-based process.

WAFER provides accurate data collection, more efficient processing of provider applications, and eliminates redundant data entry in external systems requiring subsets of the same data. In addition, 43 reports are provided to the users, allowing for better coordination of various LTCR operations whether in the region or the state office. WAFER was the first major project initiative within DHS that was executed using an Integrated Product Team (IPT) approach to facilitate the tremendous amount of stakeholder participation and project coordination activities involved in the project plan, implemented over a 13-month period.

This project resulted in the creation of the first major application in production operation that uses the DHS Java/Websphere architecture. It also uses a Sybase relational database, while successfully interfacing with a number of existing client/server and mainframe applications to provide complex data processing capabilities that meet the end users' business needs. The result of the technology used for WAFER is that MIS is functioning much more effectively and efficiently, thereby providing effective value management of MIS technical infrastructure and physical environment.

Project Description

On December 16th, 2002, the Texas Department of Human Services (DHS) Management Information Systems (MIS) division released a major product to its Long Term Care Regulatory (LTCR) customer program function. Titled WAFER (Web Accessible Facility EnRollment), the software product provided LTCR the ability to perform data entry involved in processing facility enrollment applications using a web-based interface within its state office operations. In addition, end users within state office headquarters and all regional offices were given the ability to generate a large number of reports using a new web-based interface. The new functionality was deployed within the Health and Human Services Statewide Consolidated Network and integrated with existing LTCR automated data entry functions within the Compliance, Assessment and Regulatory Enforcement System (CARES) built using client/server technologies. In addition, it interfaced with LTCR's existing business intelligence databases consolidated in the Central Data Repository. The new functionality also maintained its interfaces with non-LTCR applications such as the Claims Management System provider application and DHS' accounts receivable tracking system (ARTS).

This project resulted in the creation of the first major application in production operation using DHS Java / Websphere architecture. It also uses a Sybase relational database, while successfully interfacing with a number of existing client/server and mainframe applications to provide complex data processing capabilities that meet the end users' business needs. It also involved the first major project initiative within DHS that was executed using an Integrated Product Team (IPT) approach to facilitate the tremendous amount of stakeholder participation and project coordination activities involved in the project plan, implemented over a 13-month period.

The biggest challenge surpassed by the technical team was the successful facilitation of systems integration activities involved in the technical effort. The project involved a successful merging of new web-based technologies (Java/Websphere and Crystal Reports/ Crystal Enterprise) against a back-end Sybase database. In order to meet the real-time reporting requirements of the users, the same data repository was used for both transaction and reporting functionality. Specialized reporting tables with a one-day lag behind current data were also used for a few high-intensity reports to ensure optimal performance. Existing LTCR client/server functionality used for other LTCR operations also continued to interface with the same Sybase repository. The resulting overall functionality is one of the largest MIS user-based applications developed with these new technologies, with an average of 250 concurrent users and a total of approximately 1000 users. While users continue to adjust to the new browser-based application environments since the deployment, all applications are demonstrating satisfactory performance and each application has now merged as a logical part of the LTCR business operation.

Key to the success of this complex deployment was the rigorous participation and collaboration of the project Integrated Product Team (IPT). Stakeholders within all MIS divisions and LTCR customer areas were identified in the planning phase of this project. This was essential to develop strategies to mitigate risks related to infrastructure, standards, and process with constrained resources. MIS management backing was also essential to the IPT success. The IPT:

- Conducted continuous risk identification and risk response planning throughout the project lifecycle. Also, the IPT facilitated a logical escalation and communication of issues and risks to management that the IPT could not resolve.
- Addressed the best use of internal software and hardware resources within a constrained environment and collectively resolved to make available the necessary infrastructure during the project.

- Identified all project deliverables with the guidance of the MIS Systems Engineering and Validation (SEV) and the MIS Project Management Office (PMO). The IPT collectively developed the team responsibility matrix for development, review, and approval of all deliverables.
- Called out for and participated in quality control activities such as peer reviews and audits of project deliverables. Additionally technical reviews of the system design and source code were performed to ensure compliance with applicable standards. Performed logical and physical data model reviews.
- Took advantage of facilities in the West Texas Disaster Recovery Operations Center to set up a production environment for the Crystal Enterprise application server.
- Conducted a number of integration and load tests in test and pre-production environments involving approximately forty stakeholder participants representing various MIS and LTCR areas to ensure the sound performance of the seven internal application components and five primary technologies that would function simultaneously in the production environment.

Also key to the success of the project was the core technical team's professional commitment to deliver a quality product that met the customer's specifications. The project team:
- Successfully used the *use* case methodology combined with a requirements traceability database to set the foundation for robust requirements analysis and design.
- Used validation techniques such as mock-ups, storyboards, and prototypes to validate the requirements of the customer.
- Developed and implemented a bottom up approach to committed testing to ensure that each individual application unit worked satisfactorily before total product integration. Also used load and integration testing techniques to ensure quality of product not only in test environments but also in the production environment.

The product and project integration activities involved entailed a large number of detailed activities to be executed. This was successfully implemented both through the creation of a detailed project workplan that defined the major components of work to be performed as well as a sound organizational structure that would support the necessary activities to be performed. The project management team consisted of a product delivery manager, a project manager, and three project leads with various levels of responsibilities and focus areas. The product delivery manager role was responsible for ultimate delivery of the software products and represented MIS PMO in making available project management resources to the project. This role was also responsible for timely resolution of highly critical issues escalated by the project manager, and coordination of necessary communications to senior MIS management. The project manager was responsible for the necessary project planning and execution of the project including tailoring of plans, definition of organization, coordination of communications, resolution of issues, conducting IPT processes, and tracking project progress to completion. The overall technical effort was divided into three sub-projects focused on each major component of the product developed: data entry, reporting, and data repository enhancements. Each project lead facilitated a detailed technical work plan focused on each of the three sub-projects with a focused technical team conducting activities defined within the plan.

Project management was tailored from a number of industry standard best practices and played a critical role in the successful execution of the project. Project management processes and deliverables were accomplished through the successful tailoring of MIS PMO-based project lifecycle processes adapted from PMI (Project Management Institute). The software development processes and deliverables were tailored from MIS SEV's SDLC (Software Development Life Cycle) methodology adapted from IEEE and CMMI-based principles. Quality Assurance activities were performed under the guidance of the MIS Quality Management Services (QMS) group and were derived from the definition of a quality management plan executed during the project in the form of reviews and audits ensuring the quality of the work products.

All end user coordination activities were facilitated by dedicated resources within the LTCR Data Management and Analysis (DMA) group. Under the leadership of the customer project director, DMA ensured LTCR participation throughout the project cycle. In addition to participating in all IPT processes, DMA actively conducted user coordination activities throughout the project lifecycle to perform the following activities:

- Facilitation of gathering end user requirements in focused joint requirements planning sessions.
- Facilitation of application design validation activities using joint application design (JAD) sessions.
- Change control processing ranging from processing end user change request, prioritization and approval within the change control board, to timely coordination of detailed final requirements with the technical project team.
- Acceptance testing involving test plan creation, end user identification, user testing coordination, as well as test result compilation and communication to the technical project team.
- Participation in various load and integration testing activities as appropriate.
- Creation and delivery of high quality end user documentation targeted at ease of use as well as communicating system use from the perspective of program operations and procedures.
- Training activities planned and conducted previous to the release to prepare the user for the new functionality, especially keeping in mind the transition to web-based technologies by the end user.

Significance to the improvement of the operation of government
This project improved the operation of DHS from three perspectives:

(1) LTCR improvement through the efficient use of automation processes

The application provided a number of benefits to LTCR's program operations by:

- Reducing staff workload involved in the licensing application and renewal processes allowing for diversion to other more critical quality and enforcement functions.
- Improving access to LTCR data for program management, surveyors/investigators, public users, and legislative and other governmental users.
- Eliminating redundant data entry and duplicate data records.
- Consolidating information from multiple legacy databases and paper-based processes into more streamlined, integrated automated processes.
- Simplifying or eliminating process deviations related to different provider application types, allowing for a more common and efficient understanding of the process.
- Facilitating data capture and reporting historical facility application information that was being automatically overlaid by current data in previous automation functions and had to be retrieved through paper-based processes.
- Holding detailed requirements analysis meetings to review and standardize numerous status flags and business rules involved in the workflow approval process.
- Bridging the gap between data entry functions and reporting / tracking requirements.
- Providing for timely summary and *ad hoc* reports for program reporting and management needs.

(2) DHS organizational improvement to deliver projects through the application of IPT methods

Incorporating an Integrated Product Team approach on this project allowed its successful execution from planning to completion despite the amount of details and coordination activities involved. The IPT method entailed the need for each stakeholder to take ownership of the success of the overall project effort and go beyond their individual responsibilities and priorities in ensuring success. In addition, it allowed for an organized forum for communicating project progress, conducting issue resolution, and escalating only prioritized issues that required senior management's attention.

This approach -- including processes, templates, and strategies -- would be of benefit to other projects not only within DHS, but at other agencies as well. In addition, the application of IPT methods would not be restricted to information technology related projects, but would benefit any projects in other subject areas requiring significant amounts of coordination and a diverse stakeholder base.

(3) **Use of Web-based technologies**

This project selected a web-based technology which provides easy maintainability as well as increased cost savings by:

- Using a centralized database and application server, eliminating the need for software distribution to keep the database and application server current. Since the database and application server are centralized, the data will never be out of date.
- Administering security from a single point, thereby resulting in savings due to less manpower to keep updated.
- Using a web-based front end, reducing the need for staff training due to staff already being familiar with web browsers.
- Being user friendly. Although the application is using two dramatically different tools in the back end -- Java/Websphere and Crystal Reports/Crystal Enterprise -- by using a web-based front end, these appear to be one to the user.
- Increasing scalability by using a web server, application server, and a database server. If one has a problem, it is a simple matter to add hardware to the one, allowing for less expensive tuning of services to hardware.
- Reusing software: The new Java code is reusable and will lower costs in implementing other related applications.

Known Benefits to Date

WAFER has resulted in more accurate and efficient decision-making processes within LTCR. When a provider application is received, individual users involved in the decision-making process have access to more information consolidated from various automated sources, enabling them to make a more responsive decision. Lack of access to integrated information caused the previous process to be more prone to errors involved in manually consolidating the information. It also involved longer processing times in collecting the information. WAFER raised the level of service to providers both from a quality as well as an efficiency perspective. It also allowed for better implementation of procedures derived from state of Texas legislative mandates.

WAFER allowed for LTCR operations to be conducted in the defined efficient manner mandated by DHS procedures. It provides users new flexibility to enter data into the automated system as it is received rather than requiring that the physical processing of application paperwork be complete before any information is recorded. This practice was a result of the limitations of previous systems. Since data is received incrementally, the WAFER application enhances data integrity by reducing the opportunity for data to be misplaced or forgotten.

WAFER also provides the ability to capture and retain history on facilities and their owners. Prior to WAFER, application data was overwritten with each new update, making retention of historical changes impossible. Since WAFER records information by effective dates, application data and history is maintained correctly even if an older application is data entered after a more recent one has been recorded. The ability to capture and maintain history has significantly reduced the workload of LTCR staff who used to have to pull folders manually to research facility histories. This research task was particularly time-consuming given that older files are archived off-site. Having this information immediately available through WAFER allows LTCR to answer questions from management, state legislators and consumers much more quickly – often on the same day the request is received. It also provides more complete information to LTCR staff responsible for using history as one element in evaluating whether a facility should receive a license.

WAFER has also provided a structure that allows simultaneous tracking of multiple applications for the same facility. This has greatly reduced the possibility that conflicting applications could be processed by different staff without being made visible. This helps the program maintain better data integrity and avoid licensing conflicts, as well as reducing resource expenditures required to backtrack and correct the different applications.

The project also greatly increased the number of reports that are available to state office and regional users. These users can now access necessary information immediately, without requiring intervention by state office staff. The additional information and reports can also be used by LTCR management to identify problems with facilities, or internal business rules and processes more quickly.

Operational Benefit

By bridging between existing LTCR applications to better process provider applications, the WAFER application allows for the continued transition of LTCR from legacy standalone databases, interim solutions, and paper-based procedures to integrated automated solutions. This includes cost reduction in the deployment, support, and maintenance roles involved in these procedures.

The FoxPro-based legacy processes that WAFER replaced were rapidly becoming difficult to maintain as most of the original designers had left the agency, or moved to non-support functions. The quality and lack of data integrity associated with the old procedures was resulting in lowered levels of operational benefits for the cost being incurred. This, combined with the limited system documentation for the legacy system, resulted in loss of time and effort in "re-learning" the legacy data structures. In contrast, the WAFER system design and functionality has been well documented with a strong foundation framework so that future enhancements may be made efficiently.

In order to respond to reporting requests in the subject area, dedicated roles were previously involved in collecting the information into a separate database built specially for this purpose, converting the data into a format required for the report, and redistributing it to the requesting entities. This has now been replaced with direct access by the end user using ad hoc or standard reporting functionality. The WAFER application now provides DHS management the tools to do real time end-to-end tracking of the status of applications being processed.

A future benefit of WAFER for DHS is that it provides the foundation to the infrastructure needed for the agency to offer providers the opportunity to submit their applications through the Internet. Online applications would allow LTCR to reassign staff away from application data entry into more value-added functions. It would also allow providers instant feedback on the completeness and acceptance of their applications, and would place the responsibility for application data integrity on providers, rather than program data entry staff.

From a technology perspective, a number of artifacts from the WAFER project will be useful to the agency.
- The architecture framework may be reused for the creation of other applications when appropriate.
- A number of tools, techniques, and methods from the project could be reused on other projects.
- Process and technical artifacts derived from the project provide for reuse on other project initiatives or for the creation of more current templates that will better support the continued transition of DHS to Java/Websphere based technologies.
- Lessons learned from the project, especially in the use of IPT methods, both ensure the success of this project and will benefit the agency for reuse in the future.