



Theater Telemedicine Prototype Project (T2P2) Phase III

Background

Tripler Army Medical Center (TAMC) and the Pacific Regional Program Office (PRPO) have management authority over Project Akamai. Project Akamai is a Department of Defense (DOD) health project aimed at applying and assessing the issue of telemedicine and telecommunications technologies in the military Pacific Region. Project Akamai is a congressionally directed project, funded in Fiscal Years 93-99.

Project Akamai is tasked to conduct research to demonstrate and validate telemedicine prototype systems. In May of 1997, development efforts began to conduct a proof of concept and prototype of the Theater Telemedicine Prototype Project (T2P2). Beginning January 1998, Akimeka was awarded the development effort. T2P2 provides critical consultative capability for Primary Healthcare Providers (PCP) from various locations, enables utilization of clinical expertise at a regional facility (currently TAMC), and efficiently send the consultative information to the tertiary facility. The current task provides for the design, developmental testing, evaluation, integration, demonstration, training, maintenance, and materials to enhance the existing T2P2 and conduct demonstration modeling of this system in live operational environments. The existing T2P2 architecture is the first Telemedicine system to support distributed clinical workflow. It provides the capability to continually track the status of a consult from creation to closure.

Phase I provided a completed prototype system as proof of concept. Phase II provided for the continued development of the prototype T2P2 v1.5 (*T2P2 v1.5 is a multi-tiered application that uses an extremely thin web browser client to provide access to a variety of features and services*) with successful completion of both IV&V and Government Acceptance testing. Installation of the T2P2 system was completed at TAMC for acceptance testing. T2P2 provides Electronic Data Interchange (EDI) with CHCS, as well as third party radiology systems in use at Tripler. Through the T2P2 EDI connection, PCP's can identify patients and populate the clinical formats with pertinent data from CHCS without duplicate entry. The EDI features of T2P2 also support placing required laboratory, radiology, or digital imaging orders in CHCS and third party systems all from within the T2P2 consult. Phase III will provide for a Generic Consult Format, creating capability to utilize T2P2 at the Echelon 2 Level. Consult capability will be provided for any type of condition through any type of provider (e.g. nurse, technician, specialty, other), thus enabling consult to another Echelon position to receive care from another PCP or Specialty Area without having to evacuate the patient.

Organization

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- SFC Reginald Fields, ANC, NCOIC, Image Acquisition
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- COL Gregg Taylor, MC, USA, Orthopedist
- CAPT Jeff Leggit, MC, USA, Family Practice
- HM2 Jason Wright, USN, Image Acquisition
- Dr. Eugene Vasilescu, Lead Project Designer, MicroClinque
- Jack Gunther, IV&V, Booz, Allen & Hamilton
- John Draude, PRPO Systems Engineer
- Clayton Rasberry, Project Manager, Akamai

Mission Statement

Provide a client-server information telemedicine system that will extend the ability of medical providers in the Pacific to use the clinical expertise at Tripler Army Medical Center (TAMC). The goal of this system is to effectively utilize Internet protocols and Commercial- and Government-Off-The-Shelf (COTS/GOTS) products to improve a provider's access to information regardless of the patient's location in the Pacific.

Goals and Objectives

Goal – The primary goal of this developmental effort is to create a generic consult format, which would create the capability to utilize T2P2 at the Echelon 2 level. This will provide consult capability for any type of condition, by any type of provider (e.g. nurse, specialty area), enabling consult of another Echelon position to receive care from another PCP or Specialty Area without having to evacuate the patient. This task provides for the engineering, design, developmental testing, evaluation, integration, demonstration, training, maintenance, and materials to enhance the existing T2P2 and conduct demonstration modeling of this system with the Pacific-VHCA in Alaska.

Objective – Complete a version 1.6 T2P2 by providing a stable version of T2P2 v1.5 with all SIR's corrected from the 1998 release as well as enhanced upgraded functionality of T2P2 to CHCS v4.6. Complete T2P2 rollout at Schofield Barracks.

Objective – MU v1.7, due 28May99, to provide improvements as directed by the project team, Generic Clinical Consult format as a required enhancement and 1999 improvements per the task statement. Final government direction will be provided as part of the accelerated SRR/PDR/CDR cyclic process.

Objective – Advanced Concept Technology Demonstration (ACTD) of Generic Consult Format due July-99. Enhance the current clinical capability of T2P2 through a number of consult management and functional requirements, adhering to Rapid Application Development (RAD) and Joint Application Development (JAD) methodology.

Objective – T2P2 v2.0 Full Release, due 31Aug99, to provide installation ready T2P2 v2.0 software with all features and functionality per the task statement. This release will be the T2P2 software that will become an integral piece of PVHCA Alaska implementation.

Objective – Final MU v2.1, due 8Nov99, will provide all SIR corrections/updates for T2P2 v2.0 release per formal IV&V testing.

Objective – Provide “single sign-on” capability between systems that share a common interface for required systems of T2P2, including all HIS systems (CHCS, VISTA, and RPMS), MedWeb and ACCESS Radiology systems, ACI Basic Acquisition Systems, and other required support systems. Accessibility to capabilities of PACMEDNET (PMN) components shall be integrated into the existing T2P2 sign-on. Consolidated design recommendations shall be submitted to the IV&V contractor for analysis and review prior to final government submission.

Objective – Ensure logical function of the product and that system operates in the minimum physical footprint. Additional integration and testing of such components as the CLIC/LOF heritage interface subsystem and the consolidation of services from the COTS Imaging and Radiology vendor components required.

Objective – Overall system design and process logic should achieve the following integration requirements:

- All primary and supporting systems should be integrated on a Windows NT Operating system in a single hardware platform.
- System architecture and integration design will follow an open-system logic flow that utilizes distribution standards, promoting plug and play capability in supporting functionality.
- Utilize available Commercial and Government Off The Shelf (COTS/GOTS) software products.
- Use of proprietary source code or proprietary systems shall be justified to the government prior to utilization, analysis conducted by the IV&V contractor and approved by the government.

Current Status

Primary Accomplishments as of 4Q FY98:

- Completed installation of T2P2 MedWeb Server and Imaging Acquisition Server at Schofield Barracks. Provided PCP's with connection to TAMC for exception testing. Developed web-based, front-end capability for clinicians and technicians.
- T2P2 v1.5 provided for Electronic Data Interchange (EDI) with CHCS v4.5 and third party radiology systems, eliminating duplicate entry, completed and accepted in use at TAMC
- Modifications on User Interface on T2P2.
- Successful completion and approval of IV&V User Acceptance Testing November/December 1998.
- Successful completion of Government Acceptance testing.

Project Timelines

The first Development Phase was successfully completed in December 1997. At that time, an evaluation was conducted and proposal accepted to continue system development beyond initial prototype efforts. The initial operational model tested successfully in December 1998. Evolutionary Prototyping, supported by extensive Rapid Application/Joint Application Development (RAD/JAD) sessions, will be used to create a baseline for refinement in FY99. Development continues to support CHCS II V4.6 and preparation of the EVT Lab environment to support the Telemedicine Evaluation Study phase between Schofield Barracks and Tripler, scheduled for April 1999. Part of the effort to implement PVHCA will be through the release of T2P2 v2.0 in Alaska, August 1999. Continued modeling efforts and increased functionality development to support the additional functionality of the Advanced Concepts Technology Demonstration are scheduled for FY99. Schedule of Software Releases during FY99 Period of Performance: MU 1.6/1.7 – 17-21 June 99/ V 2.0 – 31 Aug 99/ MU 2.1 – 8 Nov 99.

Strategic Direction

Continued successful development of a prototype tele-consultative system in Orthopedics and Dermatology. Added clinical functionality focused on the results of the Pacific Needs Assessment and Lead Agency evacuation patterns to maximize the effect on consultation in the Pacific. This needs analysis indicated the addition of Otolaryngology, Orthopedics, Urology, and Pediatrics as the next clinical areas for development. Oncology and Asthma were identified in late 1998/early 1999 as optional additional clinical areas for development. A critical technical factor in selection of clinical areas is the maturity of peripheral devices in clinical acceptance of image quality. Continued development of this system will be focused on: interfacing heritage systems; clinical validation of consult formats; workload accountability; the addition of peripherals for image collection; maturation of system workflow, security, and configuration management; version release documentation, user training and packaging. This will further T2P2's continued modeling and sustainability for deployment to remote locations in the Pacific.

Military significance of this application can be applied across DOD military facilities and forward isolated units for remote teleconsultation. The effect of this approach could significantly impact the cost of patient movement. The elimination of movement will positively impact military readiness, maintaining soldiers on the job in the field. There is also direct application to Joint Task Force operations and humanitarian assistance by enabling forward-deployed physicians to leverage an extension of tertiary care facilities.

Summary

Phases I & II were successfully completed on 7Dec97 and 4Dec98, respectively. Analysis was conducted and a decision made by Project Akamai to continue with Phase III. For the FY99 development year, the core architecture and features provided by the Dec98 T2P2 v1.5 release will serve as a baseline. A series of four new release versions, scheduled for FY99, will provide evolutionary additions and refinements to the baseline architecture. This task will provide for the continued design, engineering, developmental testing, demonstration, training, integration and modeling of this system into the PVHCA in Alaska.