



Health eTime: A VA Scheduling Solution

The Health eTime submission for the Department of Veterans Affairs' 21st Century Medical Scheduling America Competes Contest (Challenge.gov) represents the result of a highly successful agile software development collaboration effort between MedRed LLC and BT America. Our open-source product is available to the medical-software development community for collaboratively incremental refinement and continuous sustainability. The application facilitates the lifecycle management of individual and group patient appointments from booking, canceling, and rescheduling, through to completion and the recording of appointment outcomes. It's designed to augment functionality currently provided through the legacy VistA scheduling module. The application is oriented and organically integrated with VistA as the system of record.

In order to maintain data integrity and facilitate VistA integration, a number of basic data elements, such as Patients and Providers, are drawn from the local VistA instances and rendered as "read only" within the Health eTime application. Health eTime also writes essential data, such as patient appointment information, back to VistA, where it can be accessed by other modules such as CPRS or used for reporting purposes.

Several improvements to the current VA scheduling capability are included in this release. The first is the ability to extend scheduling capability across VA sites and time zones and consolidate all scheduling activity into a single patient view. The cornerstone of this capability is the application's use of Coordinated Universal Time (UTC) to broker appointment management between the local VistA sites.

Second, Health eTime has a comprehensive data model that allows for the integrated scheduling and management of a variety of resources such as providers, rooms, and equipment.

Third, the application framework permits role-based access that can be linked, in the future, to the identity management and role definition within the VistA or MyHealthyVet systems.

Fourth, as part of an extensive set of reporting capabilities, the application creates an audit log of basic actions performed by users. This includes actions such as creating or canceling appointments. This functionality, along with other reporting capabilities, can be readily extended to provide a comprehensive overview of application and enterprise activity.

Lastly, Health eTime is a browser-based application, designed to be accessed from the tools menu of CPRS. Aside from configuration changes to the local VistA/CPRS instances, deployment requires no installation or ongoing upgrades and maintenance at the local level.

Our goal was to field a rapid prototype developed via agile methodologies. All capabilities demonstrated are functional but, as with any prototype, much of the functionality can be refined and expanded. One of the primary development goals was to demonstrate core functionality in the context of the contest



requirements and constraints. It was also important to demonstrate that open-source VistA can be effectively modernized using agile methodologies and incremental releases.

The four core functional improvements included in Version Alpha of Health eTime include:

- 1) Integration with VistA,
- 2) Scheduling capability across VA sites,
- 3) Improved resource management capability, and
- 4) A set of baseline functional capabilities consistent with VA contest requirements.

Health eTime was built with a modular architecture to allow VA to change and/or swap specific components without affecting the entire application. The application can easily be scaled up for enterprise-wide deployment. Health eTime implements open standards whenever practical in order to enhance the VA's ability to foster interoperability. The Health eTime technical-architecture stack currently includes the .Net and Java platforms. The application could also run on an open-source stack by converting the .Net portion of the application to open-source Mono applications. Health eTime integrates with VistA mainly through a set of VistA web services in order to reduce upgrade issues and reuse functionality that can be leveraged.

This solution is open source and includes an Apache 2.0 license. The following open-source components were also used to enable Health eTime operations in the test environment; Daypilot Lite 2010, Log4Net, JQuery, NHibernate, Bedework (CalDav Server), and Apache HTTP Server Version 2.2 (used to run Bedework).

Webdev.Net (CalDav libraries) and SQL Server Enterprise 2008 (SQL Server Reporting Services) were also used to create Health eTime but could be replaced with open-source solutions.

Both the application, and the web-service layer that provides integration, are released to the Open Source Electronic Health Record Agent (OSEHRA) and its community for incremental refinement and continual support.

