Alert Watch and Response Engine (AWARE)

Requirements Specification Document



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Prepared by Harris Corporation

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# Introduction

This Requirements Specification Document (RSD) is developed for the Alert Watch and Response Engine (AWARE) project for the Department of Veterans Affairs (VA) Transformation Twenty-One Total Technology acquisition program, known as T4. VA supports a request to provide a Computerized Patient Record System (CPRS) tracking system for abnormal test results related to health screening services (i.e. PSA, fecal occult blood, abnormal x-rays, etc). This document is based on an earlier VA innovation project called Alerts Re-Engineering, and will include additional enhancements to this previous project.

Currently, there is no effective way to monitor or track abnormal test result follow-up actions in CPRS, which can potentially result in unnecessary delay of, and lack of, appropriate follow-up care for patients. In addition, there is no system in place within CPRS that can identify, monitor, and track follow-up actions (e.g., sequential milestones in the diagnostic workup and treatment of a condition). Local clinical reminders and implementation of the proposed tracking of abnormal test results capability will improve early detection, diagnosis, treatment, and management of conditions, such as the indication of cancer in the Veterans Health Administration (VHA), leading to improved patient outcomes.

Results from all tests, including screenings, treatment, and diagnostic services need to be readily accessible and designated correctly within CPRS to verify appropriate and timely follow-up care. Without timely receipt of abnormal test results, follow-up care for abnormal test results, and diagnostic testing, there is a potential increase in morbidity and mortality associated with certain diagnoses suspicious for malignancy. In addition, more invasive and costly procedures to manage advanced and aggressive diseases or cancers can be avoided, which have the potential for grave consequences. Timely follow-up on test results, screening, and diagnostic studies has a significant impact on the patient’s quality of care, quality of life, and survival rate.

## Purpose

This document will specify the requirements identified in the Alert Watch and Response Engine (AWARE) project. This document is intended for software developers, engineers, and architects who will develop and implement the software modifications to the existing CPRS application to clearly define what the solutions will and will not provide.

## Scope

The scope of this request is to establish an RSD that defines a tracking and monitoring system and associated user interface within CPRS for the tracking of items such as abnormal test results and follow-up actions.

The AWARE prototype tracks and monitors follow-up actions and identifies certain critical lab and imaging test result alerts that lack timely follow-up. The AWARE prototype consists of two main components: the Alert Tracker and the Quality Improvement (QI) Tool. Harris will augment the existing AWARE prototype application and enhance it for compatibility with the version of CPRS in production at the time of award (tentatively version 29).

Highlights of the system enhancements include:

* AWARE’s current command-line VistA/FileMan menu and standalone knowledge-based editor will be converted to a web-based, graphical user interface.
* A web-based QI tool will be developed, which will allow the tracking, reviewing, and querying of a database containing alert and follow-up data at various levels (facility, clinic, and provider) and across various timeframes. Additionally, there will be various other detailed reports and enhancements that are configurable in the QI tool.
* The parameters of the specific alerts being tracked will be identified and reported, in a structured query language (SQL) database.
* Install the enhanced AWARE version in the designated VA test sites.

Table 1 – In Scope Business Requirements

| **Business Requirement (from PWS)** | **In Scope Requirements - Business Requirement Text** | **Functional Specification** |
| --- | --- | --- |
| PWS 5.2.1 | AWARE ENHANCEMENTS & NEW FUNCTIONALITY |  |
| PWS 5.2.1.a | The Contractor shall convert AWARE’s current command-line VistA/FileMan menu and standalone knowledge-based editor to a web-based, graphical user interface. | Section 2.6.1 |
| PWS 5.2.1.b | The Contractor shall develop the capability for the application to identify and report, into a structured query language (SQL) database, the parameters of the specific alerts being tracked (i.e., type of alert tracked, text of the alert, date alert generated and recipient provider identification number). | Section 2.6.2.1  Section 2.6.2.4 |
| PWS 5.2.1.c | The Contractor shall develop the following additional capabilities for the QI tool: |  |
| PWS 5.2.1.c.1 | Display, for each clinic at the facility (e.g., Primary care, general surgery, gastroenterology), a summary of the alerts generated over the past six months that shows each of the alerts monitored by AWARE Reminder Prompt, as well as the number of those alerts for which follow-up has not been detected after one week. | Section 2.6.2.5.1 |
| PWS 5.2.1.c.2 | Display, for each provider at a particular clinic, a summary of their mean number of alerts generated over the past six months and a list of the alerts (of the type monitored by AWARE) for which follow-up has not been detected after one week. This list shall be sortable by provider, alert type and time since alert issued. | Section 2.6.2.5.2 |
| PWS 5.2.1.c.3 | Navigation support: The QI Tool shall display the facility, the clinic, or the provider (as applicable), and provide the ability to navigate to a different type of display (e.g., facility, clinic, or provider level), and immediate higher level of aggregation. | Section 2.6.2.6 |
| PWS 5.2.1.c.4 | The Contractor shall develop the capability to ensure users logged into the application have access to information for each alert: patient name and identification (ID); value of the alert (e.g., prostate-specific antigen (PSA) level); data and time when alerts were acknowledged; follow-up action performed in response to alert (when captured by  AWARE), and date and time of placement of follow-up order. | Section 2.6.2.8.12 |
| PWS 5.2.1.d | The Contractor shall develop the capability within AWARE to ensure authorized users have access to a list of individual alerts, of the kind monitored by AWARE Alert Tracker, that have not received follow-up after one week, with access to patient and provider ID information. | Section 2.6.2.8 |
| PWS 5.2.1.e | The Contractor shall ensure, when logged in, users have access to the following information for each alert: patient name and ID; value of the alert (e.g., PSA level); data and time when alerts were acknowledged; follow-up action performed in response to alert (when captured by AWARE), and date and time of placement of follow-up order. | DUPLICATE OF PWS 5.2.1.c.4 |
| PWS 5.2.1.f | Navigation support: The Contractor shall develop the ability within the QI Tool to display which facility, which clinic, and which provider (as appropriate for the alert), and shall provide the ability to navigate to a different type of display (e.g., facility, clinic, or provider), and immediate higher level of aggregation. | DUPLICATE OF PWS 5.2.1.c.3 |
| PWS 5.2.1.g | User configurable business rules: The Contractor shall provide the capability, within the AWARE application, for clinical application administrators at each medical center to be able to customize AWARE’s underlying business rules for use at a particular facility. | Section 2.6.1.3 |
| PWS 5.2.2 | AWARE/CPRS INTEGRATION | Sections 2.6.3 |

The business requirements identified in Table 2 are either obsolete or out of scope. None of these requirements will be included in the AWARE product.

Table 2 – Out of Scope Requirements

| **Business Requirement #** | **Out Of Scope Requirements - Business Requirement Text** |
| --- | --- |
|  | None identified at this time |
|  |  |

## Assumptions and Dependencies

* VA Stakeholders will be available to determine, discuss and approve requirements in a manner such that the project schedule is not impacted.
* A CPRS baseline version will be determined on which the requirements would be based.

## Acronyms, Abbreviations, Term Definitions

### Acronyms

In addition to the acronyms defined below in Table 3, the OIT Master Glossary can be found at <http://vaww.oed.wss.va.gov/process/Library/master_glossary/masterglossary.htm>

Table 3 – Acronyms

| Term | Definition |
| --- | --- |
| ABR | Abnormal Radiology |
| ABM | Abnormal Mammogram |
| AWARE | Alert Watch and Response Engine |
| CAC | Clinical Application Coordinator |
| CDS | Critical Decision Support |
| COM | Component Object Model |
| CPMP | Contractor Project Management Plan |
| CUA | Common User Access |
| DLL | Dynamic Link Library |
| ERR | Enterprise Requirements Repository |
| FAT | Follow-up Action Tracking |
| FTP | File Transfer Protocol |
| GUI | Graphical User Interface |
| HIPAA | Health Insurance Portability and Accountability Act |
| IBM | International Business Machines |
| IPT | Integrated Project Team |
| IT | Information Technology |
| JC | Joint Commission |
| OCCULT BLOOD | Fecal Occult Blood lab test |
| OIT | Office of Information and Technology |
| PMAS | Project Management Accountability System |
| PSA | Prostate Specific Antigen lab test |
| PWS | Performance Work Statement |
| QI | Quality Improvement |
| RPC | Remote Procedure Call |
| RSD | Requirements Specification Document |
| SDD | System Design Document |
| SQL | Structured Query Language |
| TAR | Tracking of Abnormal Results |
| TIU | Text Integration Utilities |
| TRM | Traceability Requirements Matrix |
| VA | Department of Veterans Affairs |
| VACO | VA Central Office |
| VDL | VistA Document Library |
| VHA | Veterans Health Administration |
| VISN | Veterans Integrated Service Network |
| VistA | Veterans Health Information Systems and Technology Architecture |

### Definitions

Table 4 – Definitions

| Term | Definition |
| --- | --- |
| VistA | A 2nd Generation Architecture. Refers to both the architecture and the database, which the architecture supports |

## References

* Perlin, Jonathan B. VHA Strategies- Eight for Excellence, July 2005: <http://vaww.visn5.med.va.gov/resources/career_dev/8_for_excellence.pdf>
* VHA Operating Plans: <http://vaww4.va.gov/vhaopp/VHA_operating_plans.htm> VistA Documentation Library: [www.va.gov/vdl/](http://www.va.gov/vdl/)
* JC National Patient Safety Goals: <http://www.jointcommission.org/PatientSafety/NationalPatientSafetyGoals/08_dsc_npsgs.htm>
* VA Handbook 6500, Information Security Program: <http://www1.va.gov/vapubs/viewPublication.asp?Pub_ID=56&FType=2>
* Registry Plus, a suite of publicly available software programs for collecting and processing cancer registry data. Atlanta (GA): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion; 2010. <http://www.cdc.gov/cancer/npcr/tools/index.htm>
* VA Handbook 1104.1, Mammography Standards: <http://www1.va.gov/vhapublications/ViewPublication.asp?pub_ID=421>
* Computerized Patient Record System (CPRS) Installation Guide
* Computerized Patient Record System (CPRS) Technical Manual
* Computerized Patient Record System (CPRS) User Manual

## Planning Documentation

* AWARE v1.0 User Interface Document
* AWARE v1.0 System Design Document (SDD)
* AWARE Project Schedule
* AWARE CPRS Integration Specification
* AWARE Contractor Project Management Plan (CPMP)

# Overall Specifications

The following enhancements will improve VA’s ability to provide effective care to Veterans, in compliance with Joint Commission (JC) requirements.

The overall focus of this effort is the enhancement of clinical decision support. This will be accomplished with two strategies. The first is to enhance user notification in CPRS of abnormal and incomplete results suspicious for malignancy. Secondly, this notification will be coupled with a reminder dialog box-based workflow to encourage timely and appropriate follow-up, as well as to populate VistA with reporting data for improved population care. Results will be accessible through usual and enhanced CPRS information as well as web portal-based aggregate reporting.

Specific modalities for notifying the user will be the following: the AWARE prompt, the Select Patient notification box alerting the clinician of normal, abnormal and incomplete results, and clinical reminders on the CPRS Coversheet. In addition, SQL-based reports will be used for aggregate reporting.

This document is structured with the interpretation of requirements gathered from many sources, including interviews with VA stakeholders. Screenshots and workflows can be found in the AWARE SDD document. Searching on the corresponding requirement number in the AWARE SDD document will show associated screen mock-ups and workflows related to a requirement.

## Accessibility Specifications

### 508 Compliance Requirements

All Section 508 requirements described in the T4 Contract will be adhered to. The requirements for Section 508 Compliance can be found at <http://vista.med.va.gov/508workgroup/index.asp>. Additionally information on Section 508 Compliance can be found at [www.section508.gov](http://www.section508.gov).

## Business Rules Specifications

See Section 2.6.1.3. The business rules for an alert type will reference Reminder dialogs and associated Text Integration Utilities (TIU) templates, which will be designed by Clinical Application Coordinators (CACs) for intended actual follow-up actions.

## Design Constraints Specifications

* All constraints of the current VA VistA system apply. See VistA Monograph and VistA Document Library (VDL).
* Display limitations of CPRS, the text-based VistA interface.
* Data communication via Remote Procedure Calls (RPCs), File Transfer Protocol (FTP) of a web application with access to each site’s VistA data.
* Existing local and enterprise reporting capabilities.
* Modularity of CPRS.
* Entry points of CPRS.
* APIs common to Reminder dialogs.

## Disaster Recovery Specifications

No Disaster Recovery specifications have been identified for this project.

## Documentation Specifications

Documentation developed will comply with specifications identified in VA Project Management Accountability System (PMAS) and ProPath artifacts and templates and/or specifications identified in other VA repositories. Developers should reference and apply the conventions found in the AWARE SDD. Documentation deliverables for the future development phase of this project may include:

* User’s Guide
* Technical Reference Manual
* Installation Manual

As available, Harris will obtain templates for the documents listed above from the Department of Veterans Affairs’ artifact repositories or Business Owners.

## Functional Specifications

The Functional Specifications for AWARE represent the translation of collected Business Requirements and a blueprint for how the application will work. Any user screens in this document are not intended to represent the final “look and feel” of the screen design. They are included to illustrate the fields that are required to satisfy the functional requirements

AWARE Web- based Knowledge Base Editor

* + - 1. AWARE’s current command-line VistA/FileMan menu and standalone knowledge-based editor for managing Tracked Alert Categories shall be converted to a web-based, graphical user interface.
         1. The system shall provide a means for authorized Clinical Application Coordinators (CAC) to perform the following functions using a web-based tool:

View alert categories for follow-up action tracking.

Define alert categories for follow-up action tracking. Note: Alert categories can only be added by a VistA AWARE developer with programmer access.

Edit alert categories for follow-up action tracking. Note: Alert categories can only be edited by a VistA AWARE developer with programmer access. CACs can only edit the description field.

* + - 1. AWARE’s current command-line VistA/FileMan menu and standalone knowledge-based editor for managing Tracked Alert Types shall be converted to a web-based, graphical user interface.
         1. The system shall provide a means for authorized Clinical Application Coordinators (CAC) to perform the following functions using a web-based tool:

View alert types for follow-up action tracking.

Define alert types for follow-up action tracking.

Edit alert types for follow-up action tracking.

* + - 1. The business rules for an alert type shall reference Reminder dialogs and associated Text Integration Utilities (TIU) templates, which shall be designed by Clinical Application Coordinators (CACs) for intended actual follow-up actions.
         1. The system shall be dependent on reminder dialog designed or transferred via exchange, and customized and tested at each site via CACs with final approval on particular components needed for a particular site to be determined by a site’s own CAC(s).

The system shall provide a means for the CAC to verify existing or tailored follow-up actions in target reminder dialogs for that site with testing accounting for site-specific lab names, orderable items, etc.

The system shall provide a means for the CAC to translate the AWARE Web- based Knowledge Base into intended follow-up actions in a Reminder dialog (designed or transferred between sites via exchange).

Only reminder dialog exchange files and intended business rule files shall be transferable among sites.

Four sample Clinical reminder dialogs along with their connected knowledge base(s) shall be provided as templates for customization and final testing needed via CACs at each site. This includes the following alert types:

Prostate Specific Antigen (PSA) critical lab alert

Fecal Occult Blood (OCCULT BLOOD) critical lab alert type

Abnormal Radiology (ABR) critical imaging alert type

Abnormal Mammogram (ABM) critical imaging alert type

AWARE QI Tool to identify and report on AWARE tracked alerts

* + - 1. The system shall gather data essential for capturing alert monitoring activities into an Alert Audit/Log File as a Cache. This shall include records of data from AWARE tracked alerts with the following information:
         1. ALERT ID
         2. ALERT TEXT
         3. FACILITY/STATION
         4. SERVICE
         5. CLINIC
         6. ORDERING PROVIDER ID
         7. PATIENT ID
         8. ALERT TYPE
         9. ALERT CATEGORY
         10. ALERT DATE TIME
         11. FAT ORDER STATUS
         12. FAT PROVIDER
         13. UNACKED STATE
         14. ACKED RENEWED DATE
         15. ACKED DELETED DATE
         16. SUB-FILE OF DATA TO INCLUDE:

ORDER/FOLLOW UP

ACTION TAKEN DATE/TIME, DONE > 7 DAYS FLAG

* + - 1. The system shall gather AWARE tracked alert data into the AWARE Alert Audit/Log File that have been created within the last 2 weeks.
      2. The data for AWARE Alert Audit/Log Files shall be truncated at 2 weeks.
      3. An AWARE SQL Server Tracked Alert Data Table shall be provided with the same data record/field layout as defined for the file as a Cache in section 2.6.2.1
         1. Transfer of such data is daily and only alerts with creation date from a last captured date for transfer thru 7 days prior to today’s date are transferred since it will be known by then whether follow-up actions have been made for these alerts that are within 7 days of alert occurrence.
         2. The data record format for this SQL table is the same as that for an AWARE Alert Audit/Log File.
         3. \*The alert data for an AWARE SQL Server Tracked Alert Data Table shall be truncated at 180 days.

Assumption: This follows per original requirements in prior Alerts Re-engineering project for reports for last 180 days, and for restriction of SQL table disk storage

* + - 1. Web based Reporting shall be provided, such as with MS SQL Server Reporting Services in dashboard report type displays.
         1. The system shall display, for each clinic at the facility (e.g., Primary care, general surgery, gastroenterology), a summary of the alerts generated over the past six months.

An appropriate header for this display shall be provided.

Report “Site” selection capability shall be provided among a site/facility list.

Report “Start/Stop” date range selection shall be provided for proper data entry.

Report shall provide grouping per clinic/service.

Report “Clinic/service” selection shall be optionally provided among a clinic/service list.

A Report Display shall display the following data:

Site (Station)

Facility

Clinic/Service

Alert Type Number of Alerts % < 7 days and % > 7 days

Number of Alerts in Total with Follow-up Action within 7 days

% of Alerts In Total with Follow-up Actions done within 7 days

Number of Alerts in Total with No Follow-up Action after 7 days

% of Alerts in Total with No Follow-up Action after 7 days

* + - * 1. The system shall display, for each provider at a particular clinic, a summary of their mean number of alerts and alerts generated over the past six months and a list of the alerts follow-up that have not been detected after one week.

An appropriate header for this display shall be provided.

Report “Site” selection capability shall be provided among a site/facility list.

Report “Start/Stop date” range selection shall be provided for proper data entry.

Report shall provide grouping per clinic/service.

A Report “Clinic/Service” selection shall be optionally provided among a clinic list.

A Report “Provider” selection shall be provided among a list of providers.

A Report Display shall display the following data:

Site (Station)

Facility

Clinic/Service

Provider

Alert Type Number of Alerts % <= 7 days and % > 7 days

Mean of Alerts In Total

Number of Alerts in Total

Number of Alerts in Total with No Follow-up Action after 7 days

% of Alerts in Total with No Follow-up Action after 7 days

* + - 1. The QI Tool shall provide the ability for users to navigate to a different type of display.
         1. The system shall allow user to view data at a facility level.
         2. The system shall allow user to view data at a clinic level.
         3. The system shall allow user to view data at a provider level.
         4. The system shall allow users to filter data that is displayed.
         5. The system shall allow users to sort data.
         6. The system shall display information in a tabular format with columns names at the top with appropriate ones allow sorting.
      2. The system shall allow users to drill down to a specific alert and see patient name and identification (ID); value of the alert (e.g., prostate-specific antigen (PSA) level); data and time when alerts were acknowledged; follow-up action performed in response to alert (when captured by AWARE), and date and time of placement of follow-up order(s).
         1. An appropriate header for this display shall be provided.
         2. Report “Site” selection capability shall be provided among a site/facility list.
         3. Report “Start/Stop date” range selection shall be provided for proper data entry.
         4. Report shall provide grouping per clinic/service, and then provider.
         5. A Report “Clinic/Service” selection shall be optionally provided among a clinic list.
         6. A Report “Provider” selection shall be provided among a list of providers.
         7. A Report “Alert type” selection shall be provided among a list of alert types.
         8. A Report “Patient ID” selection shall be provided among a list of patients.
         9. A Report Display shall provide the following data:

Site (Station)

Facility

Clinic/Service

Provider

Alert Type, Alert Date/Time, Patient ID and Alert Value

Ack (Delete) Date and Ack > 7days

Follow-up Action and Date/Time of Follow-up

Follow-up > 7 days

* + - 1. The system shall provide a means for authorized users to view alert information in a web-based view.

ASSUMPTION: Proper user logon access to the authorized user’s local site is required before alert data can be retrieved.

ASSUMPTION: This can be one’s own alerts (a clinician), or an authorized user such as a patient safety officer who could view a listing of multiple users’ alerts.

* + - * 1. ASSUMPTION: Authorized users have view access to a list of individual alerts, of the kind monitored by AWARE Alert Tracker, that have not received follow-up after one week, with access to patient and provider ID information.
        2. ASSUMPTION: For an authorized user with allowed access, that user can view only their own alerts on their local site. This would appropriate for a clinician provider login. Also, multi-user views would be appropriate for a patient safety officer login.
        3. ASSUMPTION: This allows for pro-active clinician involvement in meeting their 7-day period of proper acknowledging their alerts with associated follow-up action(s).
        4. A View Report “Site” selection capability shall be provided among a site/facility list.
        5. “View Report” secure login into a selected site with a proper verify code/access code shall be required of the user before a call up of subsequent data is performed.
        6. A View Report “Start/Stop date” range selection shall be provided for proper data entry.
        7. An appropriate header for this display shall be provided.
        8. View Report shall provide grouping per clinic/service, and then provider.

As authorized user only.

* + - * 1. A View Report “Clinic/Service” selection shall be optionally provided among a clinic list.
        2. A View Report “Provider” selection shall be provided among a list of providers.
        3. A View Report “Alert type” selection shall be provided among a list of alert types.
        4. A View Report “Follow-Up <= 7 days” selection shall be provided among a list of follow-up choices including:

Follow-Up action taken <= 7 days

Follow-Up action taken > 7 days

* + - * 1. A Report “Patient ID” selection shall be provided among a list of patients.
        2. A Report Display shall display the following data:

Site (Station)

Facility

Clinic/Service

Provider

Alert Type, Alert Date/Time, Patient ID and Alert Value

Ack (Delete) Date and Ack > 7 days

Follow-up and Action Date/Time of

Follow-up and Follow-up > 7 days

* + - * 1. Some Follow-up Action Taken <= 7 days (“Yes” or “No”)
        2. The system shall allow users to drill down to a specific alert and see patient name and identification (ID); value of the alert (e.g., prostate-specific antigen (PSA) level); data and time when alerts were acknowledged; follow-up action performed in response to alert (when captured by AWARE), and date and time of placement of follow-up order(s).

An appropriate header for this display shall be provided.

Report “Site” selection capability shall be provided among a site/facility list.

Report “Start/Stop date” range selection shall be provided for proper data entry.

Report shall provide grouping per clinic/service, and then provider.

A Report “Clinic/Service” selection shall be optionally provided among a clinic list.

A Report “Provider” selection shall be provided among a list of providers.

A Report “Alert type” selection shall be provided among a list of alert types.

A Report “Patient ID” selection shall be provided among a list of patients.

A Report Display shall display the following data:

Site (Station)

Facility

Clinic/Service

Provider

Alert Type, Alert Date/Time, Patient ID and Alert Value

Ack (Delete) Date and Ack > 7 days

Follow-up Action and Date/Time of Follow-up

* + - * 1. Follow-up > 7 days

AWARE/CPRS INTEGRATION

* + - 1. The system shall provide a knowledge base alert tracker called AWARE standing for “Alert Watch and Response Engine “ that integrates with CPRS in such a manner as to provide the CPRS user (provider) with critical decision support(CDS) information regarding his tracked alerts. This connection is the AWARE/CPRS Integration.
      2. The system shall provide an “Alert Watch and Response Engine” as an independent processor (such as a COM object) which is called from CPRS and communicates with CPRS, thus minimizing changes in logic for CPRS itself.
         1. CPRS shall inform AWARE of patient selected whose unacknowledged alert will be watched, and be returned response data from AWARE’s tracked alert monitoring activities (i.e. “AWARE” standing for “Alert Watch and Response Engine”).
         2. Response data from AWARE returned to CPRS shall include the following:

Identification of Unacknowledged Tracked Alerts needing attention

CPRS workflow guidance data

* + - 1. CPRS workflow shall be modified with guidance from the “Alert Watch and Response Engine” to only allow change in the following CPRS work flows below with purpose of increasing alert follow-up actions made by the CPRS provider:
         1. The system shall provide an AWARE prompt screen interrupting the normal CPRS workflow to notify the CPRS provider that his current patient in CPRS has an associated unacknowledged abnormal resulting alert which has not been followed-up.
         2. The system shall deploy AWARE to analyze its knowledge base and consider the following data in making a decision about invoking a prompt screen in CPRS :

Vista Alert data

Alert tracking data

Certain completed and signed orders whose type of data has been defined in a specific associated Reminder dialog in the AWARE knowledge base for this type of tracked alert.

Certain completed and signed consults whose type of data has been defined in a specific associated Reminder dialog in the AWARE knowledge base for this type of tracked alert.

Certain completed free-text orders and comments whose type of data has been defined in a specific associated Reminder dialog in the AWARE knowledge base for this type of tracked alert.

Certain follow-up comments including observations whose type of data has been defined in a specific associated Reminder dialog in the AWARE knowledge base for this type of tracked alert.

* + - * 1. The system shall allow a CPRS Patient Chart Closeout function to invoke AWARE processing when initiating a New Patient selection for allowing presentation of a Prompt screen instead of normal CPRS patient selection screen.

This prompt screen shall contain patient, alert type, and instructions on accepting the directed CPRS flow, an “Address Now” button for making this re-directed flow, and also a “Close and Address Later” button for resuming normal CPRS flow with a patient selection screen.

The system shall present an AWARE prompt screen in CPRS for the patient’s most recent unacknowledged alert needing follow-up action(s).

As soon as a follow-up action(s) of a most recent tracked unacknowledged alert for a patient is completed, AWARE on next time use shall find any next most recent unacknowledged AWARE tracked type alert without follow-up action(s) for enabling a prompt screen upon return to CPRS.

* + - * 1. The system shall allow an opportunity for a CPRS provider to take decision-support re-directed workflow that guides the provider towards making appropriate follow-up actions desired for that alert.

From the AWARE prompting screen, and upon an “Address Now” choice selection, the system shall provide CPRS redirected workflow whose steps culminate in the automatic call-up of an associated VA Reminder Dialog defined in the AWARE knowledge base for the corresponding alert type.

The system shall provide the opportunities to do appropriate follow-up actions(s) defined for that alert type through the associated reminder dialog elements in the associated Reminder Dialog for that alert type.

The provider shall be asked to choose one or more of the Follow-Up actions presented (based on information contained in the knowledge base represented thru the presented Reminder Dialog), to include the following:

Making and signing order(s) defined in the AWARE knowledge database.

Making and signing consult(s) defined in a specific associated Reminder dialog in the AWARE knowledge base for this type of tracked alert.

Making and signing procedure(s) defined in a specific associated Reminder dialog in the AWARE knowledge base for this type of tracked alert.

Making free-text orders and comments defined in a specific associated Reminder dialog in the AWARE knowledge base for this type of tracked alert.

Making observation comments defined in a specific associated Reminder dialog in the AWARE knowledge base for this type of tracked alert.

Upon an “Address Later” selection choice, the system shall resume normal CPRS workflow with the “patient selection” screen.

* + - * 1. The system shall disable normal CPRS acknowledgement/deletion of a tracked alert under AWARE for a patient for which AWARE has determined no follow-up action(s) has been made.

The system shall allow an automatic renewal of alert that allows an attempted acknowledge/deletion of a tracked alert when this alert does not have associated completed follow-up actions whose types are defined in Reminder dialog elements in an associated Reminder Dialog in the AWARE knowledge base for this alert whose alert type is tracked by AWARE.

The automatic renewal of alert above shall update specific alert tracking data for that alert including date/time of renewal.

* + - 1. \*\*The system shall allow AWARE processing in CPRS not only by the ordering clinician associated with an unacknowledged tracked alert, but also by other non-ordering providers including surrogate providers who are in various CPRS groups (by service, clinic, etc.) which also include the ordering provider, and thus can see the same unacknowledged tracked alert in their notification window in the patient selection dialog box in CPRS.  
           
         \*\***NOTE**: With restrictions of who is allowed to make certain follow-up actions such as orders, these are the user(s) that are allowed to make such follow-up action(s) associated with the type of alert under AWARE.

## Graphical User Interface (GUI) Specifications

The GUI specifications for CPRS are referenced in section 2.6.3. The following modalities for accessing the AWARE workflows and information will be used: the View Alert System Notifications list in Patient Select, a clinical reminder on the cover sheet, and the AWARE prompt. The following is an example of the AWARE prompt to alert a clinician that there is a Mammogram needing attention. This begins the workflow that displays an appropriate reminder dialog box. Clicking the Address Now button starts a workflow to address the mammogram.

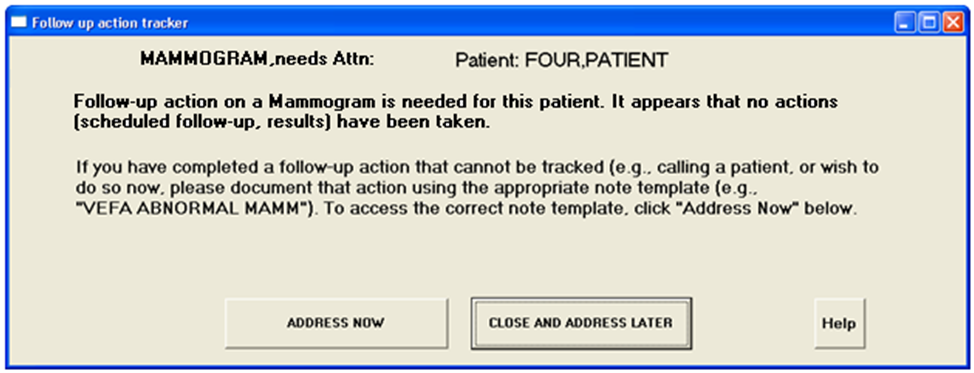


Figure - Graphical User Interface Specification Example

## Multi-Divisional Specifications

The AWARE enhancements will comply with current CPRS multi-divisional and multi-site specifications. Multi-divisional capability is at the core of the AWARE system approach, with appropriate monitoring and tracking of lab results being delivered to the requestor based on his or her eligibility. In the same manner that CPRS is multi-divisional and multi-site, and oriented to serve clinicians and/or support staff that utilize its functionality, all modifications made to CPRS will serve the same multi-divisional structure. These enhancements to CPRS for AWARE functionality operate in a multi-division or multi-site environment, recognizing an enterprise perspective while fully supporting local health care delivery to veterans.

## Performance Specifications

No Performance Specifications have been identified for this project.

## Quality Attributes Specifications

The system will comply with the existing CPRS quality and QI tool specifications identified.

## Reliability Specifications

No Reliability Specifications have been identified for this project.

## Scope of Integration

Implementation of the AWARE enhancements requires that facilities have previously implemented CPRS v29. AWARE will regularly retrieve updated information regarding abnormal test results from the Alerts file when deployed by VACO and designated abnormal labs and radiology results, etc. manually updated by field staff at each facility.

## Security Specifications

All VA and VHA security requirements will be adhered to. Cross-cutting security requirements are contained in the VA Enterprise Requirements Repository (ERR). Additionally, All VA and VHA Privacy requirements will be adhered to. Efforts that involve the collection and maintenance of individually identifiable information must be covered by a Privacy Act system of records notice.

## System Features

Features of the system are real time or near real time tracking of test results with notification to providers of abnormal test results, reporting capabilities to monitor quality, abnormal test results, outcomes, and follow-up information.

## Usability Specifications

Harris will utilize the Common User Access (CUA) standard established as an industry best practice by International Business Machines (IBM) or Microsoft’s Graphical User Interface (GUI) standards to establish a common look and feel. Usability is extremely important to the clinician and VA staff to reduce the amount of training time needed to establish a level of effectiveness with the modifications to CPRS for the Tracking of Abnormal Results (TAR).

# Applicable Standards

* The AWARE solution will comply with One VA EA and One TRM as appropriate.
* The AWARE enhancement will comply with the Health Insurance Portability and Accountability Act (HIPAA).
* The AWARE enhancement will comply with VA and VHA Patient Safety standards.
* The AWARE enhancement will comply with the applicable 508 standards stated in Appendix A3.0 of the T4 contract.

# Interfaces

This section defines the technical requirements necessary for the support of AWARE operation within the current and intended System Environment.

## Communications Interfaces

All communication interfaces for AWARE enhancement will be local. The Data Store containing tracked abnormal alerts and alert categories will flow into the Dynamic Link Library (DLL) Close Chart intercept. From there the AWARE prompt and tracking data are generated. Through CPRS, the application also interfaces with the Data Store for health factors, procedures, and orders where reports are generated.

The AWARE solution will also interface with the QI reporting tool SQL linkage from alert tracking data monitored through this CPRS-based DLL.

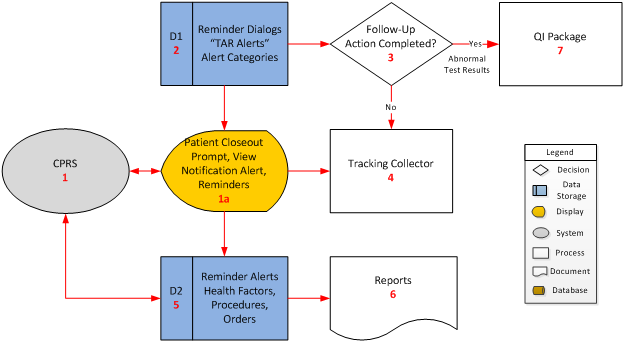


Figure - AWARE Business Process Diagram

## Hardware Interfaces

Hardware Interfaces are not applicable to this project.

## Software Interfaces

The following software interfaces apply to this effort:

* Remote procedure Calls (RPCs) with VA Broker interface.
* VA CPRS COM interface.

## User Interfaces

User Interface Specifications are included in Section 2.6 (Functional Requirements) of this document.

# Legal, Copyright, and Other Notices

The AWARE enhancement will not interfere with any existing legal disclaimers, warranties, copyright notices, patent notice, Section 508 disclaimers, or trademark logos currently incorporated in CPRS.

# Purchased Components

Hardware, software and all associated licenses will be procured by Harris and delivered to VA as per the AWARE PWS.

# User Class Characteristics

Authenticated users of the VistA system consist of clinicians for the tracking of abnormal results, support personnel for setup, and Clinical Application Coordinators (CACs) (and possibly skilled clinicians) for installation and updates. The general characteristics of the intended users of the product include an educational level sufficient for daily duties and activities, experience, and moderate-to-low technical expertise. The design of the enhancements or modifications will be user friendly, so as not to warrant any additional technical acumen.

# Estimation

Estimation of costs and schedule can be found in Call Order VA118-11-D-1009 and the AWARE Project Schedule, respectively.

Function Point Analysis is not applicable

Table 5 – Function Point Analysis Results Table

| Project Software Functional Size and Size-based Effort and Duration Estimate | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
|  | Application | | | | |  |
| Item | A | B | C | D | E | Total |
| Counted Function Points |  |  |  |  |  |  |
| Estimated Scope Growth |  |  |  |  |  |  |
| Estimated Size At Release |  |  |  |  |  |  |
| Size-based Effort Estimates | | | | | Labor Hours | Probability |
| Low Effort estimate – with indicated probability, project will consume no more than: | | | | |  |  |
| High Effort estimate -- with indicated probability, project will consume no more than: | | | | |  |  |
| Size-based Duration Estimates | | | | | Work Days | Probability |
| Low Duration estimate – with indicated probability, project will consume no more than: | | | | |  |  |
| High Duration estimate -- with indicated probability, project will consume no more than: | | | | |  |  |

# Attachment A - Approval Signatures

This section is used to document the approval of the Requirements Specification Document. The Chair of the governing Integrated Project Team (IPT), Business Sponsor, IT Program Manager, and the Project Manager are required to sign. Please annotate signature blocks accordingly.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
Signed: Date:  
Blake Henderson   
Project Manager  
Innovation Coordinator

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Signed: Date:  
Brian Stevenson   
Contracting Officer’s Representative  
Innovation Coordinator  
VHA OIA Innovation

# Appendix B – Use Case Specification

Use Cases are not applicable for this project.