Bidirectional Health Information Exchange (BHIE)

BHIE Performance and Usability Enhancements (PUE)

Requirements Specification Document (RSD)

August 2011
## Revision History

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1 Introduction

1.1 Purpose

The purpose of this Requirements Specification Document (RSD) is to record the results of the requirements gathering processes carried out for the BHIE Performance and Usability Enhancements (PUE) project. Included are traces to New Service Requests, Business Requirements Documents, Remedy Tickets, and Backlog List which drive the specification gathering processes. The BHIE PUE project uses the Agile development methodology, and as such, many of the details resulting from the specification gathering process are recorded in other documentation, specifically Agile Stories, including Epic, User, and Technical Stories. Because these details are already recorded in such documents, these artifacts are referenced, and the user is asked to access these documents for the specification details.

Epic and User Stories will be refined and developed within the framework of the Agile methodology which is based upon a series of 30-day iterations. Within the Agile methodology, each business need documented in the BHIE Backlog will be mapped to one or more Epic, User, or Technical Stories. Each Epic Story will be broken down into the appropriate User Stories, which will then be further developed into Technical Stories.

![Agile Requirements Flow Diagram]

Figure 1-1: Agile Requirements Flow
1.2 Naming Conventions

The following naming conventions were adopted to better track Agile artifacts as follows:

Epic Story and User Story naming conventions are as follows:

**ES001 – (name of Epic Story)**

This indicates that it is an Epic Story, the first Epic Story created within the adaptive perfective maintenance project, and the title of the Epic Story.
US001.01 – (name of User Story)

This indicates that it is a User Story. It is a part of the first Epic Story created within the adaptive perfective maintenance project, and that this is the first User Story within the Epic Story.

US001.01 – Clinical Notes

Figure 1-4: User Story Naming

1.3 Agile Requirements Workflow

The below chart reflects the workflow for the development of Agile requirements within the BHIE Software Engineering Team (see Figure 1.5 Agile Requirements Workflow.) The Epic and User Stories will be refined and approved formally by the Product Owners. Epic Stories will be expanded into User Stories and Technical Stories. Technical Stories will be approved only within the BHIE Software Engineering Team. The Requirements Traceability Matrix will be updated as Epic, User, and Technical Stories are approved. (See the Reference Section for locations of Epic, User, and Technical Stories, and the Requirements Traceability Matrix.)
Figure 1-5: Agile Requirements Workflow
1.4 Scope

BHIE is a system of middleware used to support a specific business need for shared or transitioning patients. The BHIE program implements an infrastructure and architecture for secure electronic sharing of medical information between Veterans Health and Benefits Administrations (VHA/VBA) and DoD systems.

The scope of this work is for BHIE to perform adaptive perfective maintenance to improve usability and performance.

Current BHIE information sharing includes, but is not limited to, the following information:

1. Allergies
2. Anatomic Pathology
3. Appointment (in design)
4. Chemistry
5. Clinical Notes (Inpatient & Outpatient)
6. Consults
7. Cytology
1. Demographics
2. Discharge Summaries
3. Documents (TGA, TIF, BMP, MPG, ASC, AVI, HTM/HTML, JPG, PDF, RTF, WAV, DCM, TXT, MPEG, MP3, MP4, etc.)
4. Encounters (Expanded ADT)
5. Forms
6. Family History
7. Hematology
8. Images (X-rays, image studies, pathology slides, wound photos, cardiology, motion views, endoscopy, surgery, eye exams etc.)
9. Microbiology
10. Neurocognitive Assessments
11. Other Past Medical History
12. Pharmacy/Medication (Order/Fill)
13. Post Deployment Health Assessment
14. Post Deployment Health Reassessment
15. Pre Deployment Health Assessment
16. Problem Lists
17. Procedures
18. Questionnaires
19. Radiology
20. Separation Physicals
21. Social History
22. Standard Ambulatory Data Record (SADR)
23. Surgical Pathology
24. Vital Signs

1.5 Acronyms

See Appendix A – Acronyms.

1.6 References

The following documents were either used in the creation of this RSD or are referenced to avoid having to maintain identical information in two locations:

- 2009707 - BHIE Usability BRD v2.2.doc
- 2009708 BHIE Performance BRD v2.2.doc
- BHIE Architecture Assessment Report v1.0.docx
- BHIE Health Prioritized Backlog
- BHIE The Way Forward-2-5.pptx
- Epic Story Locations
- New Service Request 2009707 (Usability)
- New Service Request 2009708 (Performance)
- Phase 2 Architectural Assessments
- RTM Location
- Technical Story Locations
- User Story Locations
2 Overall Specifications

2.1 Requirements

2.1.1 Business Needs/Backlog

Business Needs are documented in the BHIE Health Prioritized Backlog located on SharePoint. The backlog is a prioritized project list as defined by the Product Owner. Every item has been deemed “Required” by the BHIE Business Owners. Any requirements that were “Optional” have been tabled for later analysis and prioritization.

NOTE: BHIE SharePoint location: Requirements > Current.

2.1.2 Epic Stories

Epic stories are the requirements description for the purpose of the business to communicate briefly what is needed. They contain brief compliance and user acceptance criteria that tell the development team what is expected.

NOTE: BHIE SharePoint location: Requirements > Current > Performance and Usability Enhancements.

2.1.3 User Stories

User Stories are the more detailed business requirements that allow for elaboration and clarification of the business need. User stories can be derived from breaking the epic story down or may stand alone without an epic story. User stories that are stand-alone will be identifiable by the US000 in the first part of the user story name.

NOTE: BHIE SharePoint location: Requirements > Current > Performance and Usability Enhancements.

2.1.4 Technical Stories

Technical stories describe work that needs to be done by the technical team and are not visible to the business. Technical requirements can be the technical specification or detail behind a user story or a standalone item that the technical team needs to do that does not relate directly to a user story.

NOTE: BHIE SharePoint location: Requirements > Current > Performance and Usability Enhancements.
2.1.5 Requirements Traceability Matrix

The Requirements Traceability Matrix (RTM) maps the Epic Stories, User Stories, Technical Stories, and test cases together to ensure that requirements are met through the development lifecycle.


2.2 BHIE External System Interface Requirements

2.2.1 Related Projects/NSR

Related requests include:

Nationwide Health Information Organization NSR (20070210) and corresponding VA Nationwide HIN Adapter project (VA OED – Project Notebooks) is being developed to provide exchange of textual reports and computable data between VA and other government and private sector health organizations. Initial data exchanged includes: outpatient pharmacy, allergy, conditions, and demographics. The exchange is conducted compliant with national standards as defined by HITSP and Nationwide HIN.

2.3 To Be Specifications/Models

Refer to BHIE The Way Forward-2.5 for a description of Phase 2 deliverables.

2.4 Accessibility Specifications

BHIE consists of middleware. Therefore Accessibility Specifications are out of scope for this document.

2.5 Business Rules Specifications

Business Rules will be documented in Epic and User Stories.

2.6 Design Constraints Specifications

Design Constraints will be documented in technical specification documentation such as Technical Stories and supplemental technical documentation.

2.7 Disaster Recovery Specifications

The disaster recovery plan is managed by the VA/OI&T Enterprise Infrastructure Engineering FHIE/BHIE Inter-Agency Systems Team.
2.8 Graphical User Interface (GUI) Specifications

BHIE consists of middleware and GUI specifications are out of scope for this document.

2.9 Multi-Divisional Specifications

The delivery of BHIE data between VA and DoD is currently facilitated to the clinical users of this product by the front end GUI applications CPRS and VistaWeb. The inherent local patient care functions, station tracking, user permission data filtering, and RDV capability within each of these GUI applications, combined with the BHIE systems access to the DoD data bases triggered by CPRS and VistaWeb RPC calls, addresses the PD multi-divisional specifications listed below. New multi-divisional specifications will not be enumerated in this RSD.

- Allow multiple VA health care facilities to perform all business and patient care functions
- Capture the source where the event occurred (e.g., where the patient received care)
- Allow a user to view data across location domains according to the user’s permissions (e.g., view data for multiple VA sites and DoD facilities)
- Filter data according to a user’s permissions
- Support multi-site operations where VA may be sharing the instance with a non-VA entity such as the DoD or the Indian Health Service
- Not bind the allowable health care entities to be only VA (e.g., Health eVet-VistA and BHIE will be used by other entities, including the DoD)

2.10 Performance Specifications

Performance specifications will be documented in Agile Stories.

2.11 Quality Attributes Specifications

Acceptance Criteria constitute the quality specifications and are documented within the User Stories.

2.12 Reliability Specifications

2.12.1 Uptime Monitoring

Monitoring is managed by the BHIE Operations and Maintenance team which monitors all the services needed to keep the system functioning and returning queries.
2.12.2 Fault Tolerance

For the production environment, there are two active servers available to host the BHIE systems. If a problem is experienced on the primary server, manual steps must be taken to switch to the backup server. This can be done in approximately two to four hours. Within the production environment, the Oracle database is clustered in a manner that provides real-time fault tolerance.

2.12.3 Maintenance

Operating System and hardware maintenance will be performed by VA staff members and VA contractors at the VA contracted data center, SunGard, in Philadelphia, Pennsylvania.

2.13 Scope of Integration

BHIE is a set of applications which consist of multiple collaborating components operating within distinct organizations and network boundaries. This section provides a high-level view of primary subsystems that enable bi-directional health information exchange.

Two figures are included – a simplified view (Figure 2-1) that shows the primary source and target systems that facilitate data sharing between the DoD and VA, and a more detailed view (Figure 2-2) that includes new interfaces with external partner organizations via the Nationwide Health Information Network (NwHIN).

Error! Reference source not found. -1, below, provides a simplified BHIE deployment view. The green background represents VA components, the blue background represents DoD components, and the tan background represents end user applications.
Figure 2-1: Simplified As Is BHIE Deployment View

A more detailed listing of the BHIE Application and collaborating components is shown below in Figure 2-2. This depiction is a snapshot of the As-Is Architecture as of May 2011, plus modifications targeted for release in June 2011.

Figure 2-2: As-Is Architecture with June 2011 modifications
Below is a high-level representation of the To-Be architecture and integration for the BHIE product.

Figure 2-3: High-Level To Be BHIE Integration
2.14 Security Specifications

All changes including software functionality and hardware architecture must be configured and tested to ensure the “as accredited” security model and risk level are maintained in accordance with the VHA System Security Authorization Agreement. Refer to the BHIE System Security Plan under Project Management > Current > Project Management Accountability Systems (PMAS) > System Security Plan for additional details.

2.15 System Features

BHIE is a fully-developed set of middleware applications that is currently exchanging 31 data domains with DoD. The work specified in this document will not add new features to the system. For information regarding the as-is system features, please refer to the BHIE Architecture Assessment Report on the BHIE SharePoint site under Analysis and Design > Current > Architecture Assessment.

2.16 Usability Specifications

Usability specifications do not apply as the BHIE system is middleware only.

3 Interfaces

3.1 Communications Interfaces

BHIE Phase 2 Architectural Assessment communicates using the following data standards:

- CCR/CCD - C32, C62, C48, C84, C83, C37
- CHI (HIPAA)
- COAS/PIDS
- Delimited Text
- DICOM
- EDI, X12
- HL7 V 2.x, 3.x, HL7 CDA
- IHE XCA
- NCPDP
- RxNORM, LOINC, SNOMED, iCD-9, CPT
- VHIM 2.x
- XML

Refer to the Architecture Assessment Report on the BHIE SharePoint site under Analysis and Design > Current > Architecture Assessment for detailed information on interfaces.
3.2 Hardware Interfaces

Refer to the Architecture Assessment Report v1.0.docx on the BHIE SharePoint site under Analysis and Design > Architecture Assessment for detailed information on interfaces.

3.3 Software Interfaces

Refer to the Architecture Assessment Report on the BHIE SharePoint site under Analysis and Design > Architecture Assessment for detailed information on interfaces.

3.4 User Interfaces

Refer to the Architecture Assessment Report on the BHIE SharePoint site under Analysis and Design > Architecture Assessment for detailed information on interfaces.
4 Legal, Copyright, and Other Notices

Not Applicable.

5 Purchased Components

No new components will be purchased for this phase of the project.

6 User Class Characteristics

Intended users of this product consist of DoD and VA health care clinicians and benefits adjudicators in the assessment and treatment of their patients/clients to include:

Healthcare

- Dietitians
- Doctors
- Education specialists
- Nurses
- Social workers
- Pharmacists
- Physicians’ assistants

Benefits

- Adjudicators
- Care/case coordinators
- Care/case managers

7 Estimation

Epic, User, and Technical Stories will determine story points and function point counts.
### A. Appendix A – Acronyms

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<td>AVI</td>
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<td>BHIE</td>
<td>Bidirectional Health Information Exchange</td>
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Attachment A – Approval Signatures

REVIEW DATE: August 23, 2011
SCRIBE: David Malmstrom

Steven Green
Program Manager

Joan P. Cohen
Business Sponsor