**Department of Veterans Affairs**

Mental Health – Suicide Prevention

Suicide Prevention Package



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System Design Document

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*Submitted by:*

Booz Allen Hamilton Inc.

141 W. Front Street, Suite 200

Red Bank, NJ 07701

Phone: 732-936-3500

Fax: 732-936-3535



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Artifact Rationale

The System Design Document (SDD) is a dual-use document that provides the conceptual design as well as the as-built design. This document will be updated as the product is built, to reflect the as-built product.

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# Introduction

This document describes some of the changes implemented to the MHA system by the Suicide Prevention Project. It currently consists of three different efforts: new instruments, a dashboard, and migrating to the intranet.

## Scope

This document describes changes made by patch YS\*5.01\*135.

The project scope can be found in the Suicide\_Prevention\_Requirements.xlsx in <https://URL/ccm/web/projects/MHLTH%20(CM)#action=com.ibm.team.scm.browseElement&workspaceItemId=_qnwDoOTkEees-sAm-9T4WA&componentItemId=_qEOEgvr4EeePfNSGcJfSjQ&itemType=com.ibm.team.scm.Folder&itemId=_TPF09_r6Eee0AMheAjwAgw>

## User Profiles

Users of this application will include Mental Health professionals and clinicians.

The technical background and degree of sophistication of the individual users will vary.

# Background

## Overview of the System

The MHA provides a mechanism to administer and score standardized questionnaires and psychological tests. It provides a mechanism for both patients and clinicians to enter responses to these instruments and also provides automated scoring of the instrument. MHA runs in conjunction with CPRS (Computerized Patient Record System). A user of CPRS can branch to MHA as needed via the CPRS Tools menu. MHA instrument results may be used by Clinical Reminders as a participant in reminder logic or as a part of a Reminder Dialog. Health Summary also allows the display of MHA instrument results.

MHA Dashboard supports this system by giving views of cohorts of veterans and their status. The data displayed varies by the selected workflow of the individual user.

## Overview of the Business Process

MHA is already running as part of Veterans Health Information Systems and Technology Architecture (VistA). SPP will add more instruments to MHA. It will also add a dashboard application to review the status of several veterans at a glance.

For additional details reference section 3.1.2, 3.2.1 and Section 6.

## Overview of the Significant Requirements

The significant requirements for the dashboard can be found in the Suicide\_Prevention\_Requirements.xslx document; which combines the Business Requirements Document and a traceability matrix, and is located at:

[https://URLv/ccm/web/projects/MHLTH%20(CM)#action=com.ibm.team.scm.browseElement&workspaceItemId=\_qnwDoOTkEees-sAm-9T4WA&componentItemId=\_qEOEgvr4EeePfNSGcJfSjQ&itemType=com.ibm.team.scm.Folder&itemId=\_TPF09\_r6Eee0AMheAjwAgw](https://URL/ccm/web/projects/MHLTH%20(CM)#action=com.ibm.team.scm.browseElement&workspaceItemId=_qnwDoOTkEees-sAm-9T4WA&componentItemId=_qEOEgvr4EeePfNSGcJfSjQ&itemType=com.ibm.team.scm.Folder&itemId=_TPF09_r6Eee0AMheAjwAgw)

Patch YS\*5.01\*135 adds a routine to assist with the development of the upcoming dashboard application.

# Conceptual Design

This section will describe MHA as currently designed. The design is not affected by the release of an updated file entry.

## Conceptual Application Design

MHA is a Windows client application written in Delphi. It communicates with VistA via the Remote Procedure Call Broker (RPC Broker). The existing architecture of the system will not change for this patch. This patch adds a test RPC for the upcoming dashboard application.

### Application Context

Mental Health Assistant is a package within VistA and does not interface to external systems. There is a client user interface which is launched from CPRS. Like CPRS, the client application communicates with VistA via the RPC Broker.

Figure 1: Mental Health Assistant

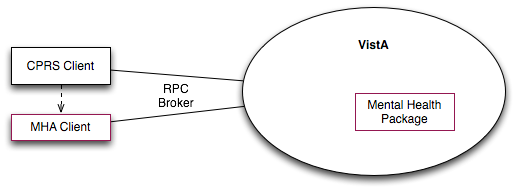


Table 1 (Grouping): Application Context Description

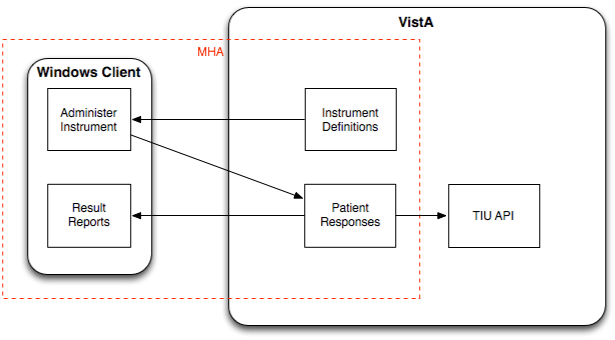
Object

| ID | Name | Description | Interface Name | Interface System |
| --- | --- | --- | --- | --- |
| CPRS Client | CPRS Client | CPRS Windows executable client application. | RPC Broker | VistA |
| MHA Client | MHA Client | Mental Health Assistant executable client application – launched from CPRS. | RPC Broker | VistA |

### High-Level Application Design

This is a simple VistA patch with no major components to be built or modified. The design of the Mental Health Assistant as it currently exists, is not being changed. The as-is design is shown in Figure 2.

**Figure 2: Application Design**



### Application Locations

The application runs as a VistA package in locations where VistA is installed.

Table 2: Application Locations

| Application Component | Description | Location at Which Component is Run | Type |
| --- | --- | --- | --- |
| VistA | VistA package – a subset of the Mental Health package. | All VistA instances. | N/A |

Table 3: Application Users

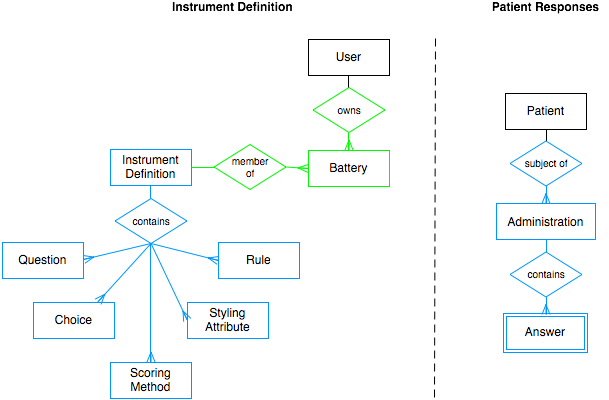
| Application Component | Location | User |
| --- | --- | --- |
| VistA | All VAMCs and Clinic with VistA access | Mental Health Clinician |

## Conceptual Data Design

### Project Conceptual Data Model

The database for Mental Health Assistant, as it currently exists, is not being changed. The database consists of a set of FileMan files. The as-is design is shown in Figure 3. There are two main sets of tables in the database. One set is used to describe the content, layout, and behavior of mental health instruments. The other set is used to store answers from or on behalf of the patient. Below is the current data model. No modifications to the data model are being changed.

Figure 2: Project Conceptual Data Model



### Database Information

N/A. No changes are being made.

### User Interface Data Mapping

Mental Health Assistant is an application that allows the user to select and instrument, administer an instrument, and review the responses and scores from previously entered instruments. There are no user interface components in this patch.

## Conceptual Infrastructure Design

There are no changes to the VistA infrastructure in this patch. Delphi / MUMPS uses a client / server design currently utilized in the VA Delphi/ MUMPS applications.

### System Criticality and High Availability

This patch has very low impact to the operation of VistA. The disaster relief plans for VistA are not affected by this patch.

### Special Technology

N/A. No special technology is involved in the patch.

### Technology Locations

N/A. This is a simple VistA patch – there are no special technology components.

### Conceptual Infrastructure Diagram

N/A. There are no external interfaces or special environments involved.

# System Architecture

## Hardware Architecture

There are no hardware modifications with this Mental Health Assistant release; however, previous packages have been run on the standard hardware platforms used by the Department of Veterans Affairs Health Care System facilities. These systems consist of standard or upgraded Alpha AXP clusters or standard intel hardware Windows operating system and run either Cache-VMS, Cache-NT, Cache- OpenVMS, or Cache- Windows Server 2008 or higher.

## Software Architecture

There is no change in software architecture.

## Network Architecture

No communication within the system, such as local area networks (LANs) and buses are being added, removed, or modified. MHA uses local Network configurations to communicate between the MHA application and VistA. For information on Network Architecture please reference the VDL.

## Service Oriented Architecture / ESS

This patch updates the file entries and target source mapping that represent the MHA. There are no new services provided or consumed.

## Enterprise Architecture

VA Technical Reference Model (TRM)/ Standards are used in the development, operations, and sustainment of VistA is shown in Table 5. All TRM applications are approved by the One-VA TRM VA Technology License Team.

**TRM Link** <https://www.va.gov/trm/>

Table 5: TRM Tools Used

| Application | TRM Compliant | Environment | License |
| --- | --- | --- | --- |
| MUMPS  (Massachusetts General Hospital Utility Multi-Programming System) | Yes | All | ISO/IEC 11756:1999 |
| Caché | Yes | All | Commercial / v2014 |
| VA M Programming Standard | Yes | All | VA Standard Document. <http://URL/VAStandardPage.asp?tid=7404> |
| dWinlock | Yes | All | Commercial / v3.3 |
| TMS VCL Component Pack | Yes | All | Commercial Site License v8.8.5.1 |
| RAD Studio version Delphi XE8 | Yes | All | Commercial / version Delphi XE8 |

# Data Design

This patch does not change the current data design.

## DBMS Files

N/A. This patch does not add new files or columns..

## Non-DBMS Files

N/A. There are no files outside of the VistA FileMan database.

## Data View

The data files changes listed in previous sections are all accessed using RPCs and the RPC interfaces are unchanged. As a result, there are no changes in this patch that alter the data view.

# Detailed Design

## Hardware Detailed Design

MHA is a Client-Server application delivered on a networked, Intel-processor-based computer. The computer has the VA-standard human interface devices: a keyboard and a mouse. Because MHA is designed to be able to be used by the visually impaired, the system also includes a set of speakers or headphones.

## Software Detailed Design

### Conceptual Design

There is no change in the GUI design of Mental Health Assistant for this patch.

#### 6.2.1.1. Product Perspective

##### 6.2.1.1.1. User Interfaces

The MHA GUI will comply with the general requirements for all VistA® applications as specified in the VistA Graphical User Interface Standards and Conventions document, Section 4, Look and Feel.

##### 6.2.1.1.2. Hardware Interfaces

N/A. There are no hardware components for this patch.

##### 6.2.1.1.3. Software Interfaces

MHA requires the following software on the VistA servers:

* FileMan v22.2
* MailMan v8.0
* Kernel v8.0

MHA can connect with the following software:

* CPRS (current Version)

##### 6.2.1.1.4. Communications Interfaces

There are no special communication interfaces required for this functionality.

##### 6.2.1.1.5. Memory Constraints

There are no memory constraints.

##### 6.2.1.1.6. Special Operations

There are no special operations required to implement Instruments.

#### 6.2.1.2. Product Features

N/A There are no product feature changes for this patch.

#### 6.2.1.3. Dependencies and Constraints

There are no additional dependencies or constraints.

#### 6.2.1.4. User Characteristics

MHA is used by mental health clinicians. Patients may optionally be asked to use the questionnaire portion of MHA.

### Specific Requirements

#### 6.2.2.1 Database Repository

N/A. There is no change in the database repository.

#### 6.2.2.2 System Features

N/A This patch does not change any system features.

#### Design Element Tables

##### 6.2.2.3.1 Routines (Entry Points)

This patch does not change existing routines but contains a new routine and entry points for the MHA Dashboard.

Figure 3 MHA related RPCs and Routines



##### 6.2.2.3.2 Templates

N/A. No templates are involved.

##### 6.2.2.3.3 Bulletins

N/A. No bulletins are involved.

##### 6.2.2.3.4 Data Entries Affected by the Design

N/A. No data entries are affected.

##### 6.2.2.3.5 Unique Record(s)

N/A. No unique records are involved.

##### 6.2.2.3.6 File or Global Size Changes

The change in file size with this patch is dependent on the site. Existing files are unchanged and new sub files size at startup will approximately match the size of current data file they’re replacing.

##### 6.2.2.3.7 Mail Groups

N/A. No mail groups are involved.

##### 6.2.2.3.8 Security Keys

These security keys have been in place and will not change with this development.

**Name Description**

##### 6.2.2.3.9 Options

N/A. No options are involved.

##### 6.2.2.3.10 Protocols

N/A. No protocols are involved.

##### 6.2.2.3.11 Remote Procedure Call (RPC)

There are no changes for any external users of the RPCs. For a complete list of RPCs please see the section on Routines.

##### 6.2.2.3.12 Constants Defined in Interface

N/A. No interfaces are involved.

##### 6.2.2.3.13 Variables Defined in Interface

N/A. No interfaces are involved.

##### 6.2.2.3.14 Types Defined in Interface

N/A. No interfaces are involved.

##### 6.2.2.3.15 GUI - Overview

N/A. The GUI is not modified.

##### 6.2.2.3.16 GUI Classes

N/A. The GUI is not modified.

##### 6.2.2.3.17 Current Form

N/A. No forms are modified.

##### 6.2.2.3.18 Modified Form

N/A. No forms are modified.

##### 6.2.2.3.19 Components on Form

N/A. No forms are modified.

##### 6.2.2.3.20 Methods

N/A. No methods are involved.

##### 6.2.2.3.21 Special References

N/A. There are no special references.

##### 6.2.2.3.22 Class Events

N/A. There are no class events.

##### 6.2.2.3.23 Class Methods

N/A. There are no class methods.

##### 6.2.2.3.24 Class Properties

N/A. There are no class properties.

##### 6.2.2.3.25 Uses Clause

N/A. No uses clause is involved.

##### 6.2.2.3.26 Forms

N/A. No forms are modified.

##### 6.2.2.3.27 Functions

N/A. No functions are added/modified.

##### 6.2.2.3.28 Dialog

N/A. There are no changes to the DIALOG file.

##### 6.2.2.3.29 Help Frame

N/A. There are no changes to Help Frames.

##### 6.2.2.3.30 HL7 Application Parameter

N/A. HL7 is not used.

##### 6.2.2.3.31 HL7 Logical Link

N/A. HL7 is not used.

##### 6.2.2.3.32 COTS Interface

N/A. No COTS products are involved.

## Network Detailed Design

There is no current change in network functionality. MHA is a Client-Server application delivered on the VA network. Each VA region / facility is responsible for their own network schema. Below contains the network interactions for the project. Future planned, but not finalized, changes can be found in Figure 5 below.

Figure 5



## Security and Privacy

### 6.4.1 Security

MHA allows a staff member to select one or more Instruments to administer, put the computer into a kiosk mode, and turn the computer over to the veteran to respond to the instrument. In this mode, the only thing that can be done by the veteran is respond to the instrument. All other functions of the computer are inaccessible apart from the entry of the staff member’s credentials to unlock the kiosk mode. When the veteran has completed the self-administration of the instrument, access to the system will be prevented until a staff member supplies the appropriate credentials.

No changes will be needed to the security and privacy requirements already approved for VistA and the GUIs.

MHA functionality will adhere to all VA and VHA security requirements.

### 6.4.2 Privacy

MHA software application did not release any new security keys. The YSP security key is still required to control access to the results of “non-exempt” instruments. While anyone may administer a “non-exempt” instrument, only psychologists with the YSP security key may view the results. Holders of the YSP security key are determined by the Chief of Psychology or a senior psychologist at a facility that does not have a Chief of Psychology. The Chief of Psychology or senior psychologist also determines which tests are “exempt” (i.e., the results can be seen by anyone), and which are “non-exempt” (i.e., require the YSP key to see the results).

## Service Oriented Architecture / ESS Detailed Design

N/A. This patch does not affect the consumption or provision of any services.

### Service Description for <Consumed Service Name>

N/A.

### Service Design for <Provided Service Name>

#### 6.5.2.1 Introduction

##### 6.5.2.1.1 Purpose and Scope of Service

N/A.

##### 6.5.2.1.2 Links to Other Documents

N/A.

#### 6.5.2.2 Service Details

##### 6.5.2.2.1 Service Identification

N/A.

##### 6.5.2.2.2 Service Versions

N/A.

##### 6.5.2.2.3 Summary of Design and Platform Details

###### 6.5.2.2.3.1 SOA Pattern(s) Implemented

N/A.

###### 6.5.2.2.3.2 COTS Platform vendor names and versions for hosting platform

N/A.

#### Dependencies

N/A.

#### Service Design Details

N/A.

##### 6.5.2.4.1 Interface Technical Specs

N/A.

###### 6.5.2.4.1.1 Service Invocation Type

N/A.

###### 6.5.2.4.1.2 Service Interface Type

N/A.

###### 6.5.2.4.1.3 Service Name

N/A.

###### 6.5.2.4.1.4 Interface

N/A.

###### 6.5.2.4.1.5 End Points

N/A.

###### 6.5.2.4.1.6 Operations or Methods

N/A.

###### 6.5.2.4.1.7 Message Schemas

N/A.

##### 6.5.2.4.2 Information Model

N/A.

###### 6.5.2.4.2.1 Class Diagram and Description of Entities Involved

N/A.

###### 6.5.2.4.2.2 Mappings from ELDM to Standards Based Schemas

N/A.

##### 6.5.2.4.3 Behavior Model (AKA Use Case Realization)

N/A.

###### 6.5.2.4.3.1 Use Cases (Use Case Model)

N/A.

###### 6.5.2.4.3.2 Interaction Diagrams

N/A.

#### 6.5.2.5 Gap Analysis

N/A.

##### 6.5.2.5.1 Variances from Enterprise Target Architecture

N/A.

##### 6.5.2.5.2 Variances from SLDs

N/A.

##### 6.5.2.5.3 Variances from Standards and Policies

N/A.

##### 6.5.2.5.4 Justification for Exceptions and Mitigation

N/A.

# External System Interface Design

N/A. There are no external interfaces as part of this patch.

## Interface Architecture

N/A.

## Interface Detailed Design

N/A.

# Human-Machine Interface

N/A. The user interface is not changed by this patch.

## Interface Design Rules

N/A.

## Inputs

N/A.

## Outputs

N/A.

## Navigation Hierarchy

N/A.

# Attachment A – Approval Signatures

This section is used to document the approval of the System Design Document. The review should be conducted face to face where signatures can be obtained ‘live’ during the review. If unable to conduct a face-to-face meeting then it should be held via LiveMeeting and concurrence captured during the meeting. The Scribe should add /es/name by each position cited. Example provided below.

The Business Sponsor and Project Manager are required to sign.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Signed: Date:

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Signed: Date:

1. Additional Information
   1. Identification of Technology and Standards

The system which applies to the SDD is Mental Health Assistant v3. Software used is Massachusetts General Hospital Utility Multi-Programming System (MUMPS) which is TRM compliant. American National Standards Institute [ANSI], International Organization for Standardization [ISO], Institute of Electrical and Electronics Engineers [IEEE] will be complied with during the software coding of PCL-5 MHAS.

* 1. Constraining Policies, Directives and Procedures

None identified at this time.

* 1. Requirements Traceability Matrix

The RTM can be found within the SPP\_Prevention\_Requirements.xlsx located at: https://URL/ccm/web/projects/MHLTH%20(CM)#action=com.ibm.team.scm.browseElement&workspaceItemId=\_qnwDoOTkEees-sAm-9T4WA&componentItemId=\_qEOEgvr4EeePfNSGcJfSjQ&itemType=com.ibm.team.scm.Folder&itemId=\_TPF09\_r6Eee0AMheAjwAgw

* 1. Packaging and Installation

This patch is distributed via a Packman message and may be installed with users on the system although it is recommended that it be installed during non-peak hours to minimize potential disruption to users. This patch should take less than one hour to install.

This patch will update the MHA Database:

1. Choose the PackMan message containing this patch.
2. Choose the INSTALL/CHECK MESSAGE PackMan option.
3. From the Kernel Installation and Distribution System Menu, select the Installation Menu. From this menu, you may elect to use the following options. When prompted for the INSTALL NAME enter YS\*5.01\*135.
   1. Backup a Transport Global - This option will create a backup message of any routines exported with this patch. It will not backup any other changes such as DDs or templates.
   2. Compare Transport Global to Current System - This option will allow you to view all changes that will be made when this patch is installed. It compares all components of this patch (routines, DDs, templates, etc.).
   3. Verify Checksums in Transport Global - This option will allow you to ensure the integrity of the routines that are in the transport global.
4. From the Installation Menu, select the Install Package(s) option and choose the patch to install.
5. When prompted ‘Want KIDS to Rebuild Menu Trees Upon Completion of Install? NO//’ enter NO.
6. When prompted ‘Want KIDS to INHIBIT LOGONs during the install? NO//’ enter NO.
7. When prompted 'Want to DISABLE Scheduled Options, Menu Options, and Protocols? NO//’ enter NO.
8. If prompted ‘Delay Install (Minutes): (0 – 60): 0//’ respond 0.
   1. Design Metrics

Compliance with Veterans Affairs Standards and Conventions (SAC) and other VA design conventions will be maintained.

* 1. Required Technical Documents

The following documents must be submitted for review to support proper approval:

* Conformance Validation Statement (CVS) - Section 508- 508 is not applicable to this patch.
* YS\*5.01\*135 Patch Description
* YS\*5.01\*135 Version Description Document (VDD)
  1. Acronym List and Glossary

| Term | Meaning |
| --- | --- |
| CPRS | Computerized Patient Record System |
| DSM-5 | Diagnostic and Statistical Manual of Mental Disorders – 5th Edition |
| MHA | Mental Health Assistant |
| MUMPS | Massachusetts General Hospital Utility Multi-Programming System |
| PSPO | Patient Safety Program Office |
| PTSD | Posttraumatic Stress Disorder |
| RPC Broker | Remote Procedure Call Broker |
| RSD | Requirements Specification Document |
| RTM | Requirements Traceability Matrix |
| SAC | Standards And Conventions |
| SDD | System Design Document |
| SSO | Single Sign-On |
| SPP | Suicide Prevention Project |
| SQA | Software Quality Assurance |
| TRM | Technical Reference Model |
| VA | Veterans Administration |
| VDD | Version Description Document |
| VistA | Veterans Health Information Systems and Technology Architecture |