Perceptive Reach

Integrated Reach Database System

(IRDS)

Dashboard Design Document



Department of Veterans Affairs

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Revision History

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| 12/10/2014 | 1.0 | Final review | Paul Bradley and Monica Mohler |
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Artifact Rationale

The Dashboard Design Document is a dual-use document that provides the conceptual design as well as the as-built design of the IRDS dashboard. This document will be updated as the product is built, to reflect the as-built product. Wireframes are to be considered “proof of concept” drawings that may differ from the finalized design in the application.

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# About this document

This document is a “work in progress.” The dashboard will be designed through a series of mockups and iterative development sprint cycles in collaboration with VA stakeholders and users. The document will be populated with content as the design evolves with each sprint, including all potential data options, configurability rules and options. The early versions of the document will focus on the conceptual dashboard design, key business requirements, and the primary end-user features related to the design of the dashboard. Future versions will add additional detail as it becomes available.

# Introduction

VA is seeking to expand suicide prevention to include upstream approaches designed to reduce initiation or escalation of a risk factor. Upstream suicide interventions target individuals or groups who exhibit biological, psychological, or social risk factors that are more prominent among high-risk groups than among the larger population. Understanding the unique needs of our nation’s Veterans and the military culture as it relates to stigma and mental health is important for early intervention. The goal of the Integrated Reach Database System (IRDS) innovation is to promote the general health of the Veteran population and effectively intervene in issues before they escalate in crisis.

The IRDS innovation will serve to bolster the three major components of the Veteran Health Administration’s (VHA) Strategic Plan for Suicide Prevention: surveillance, risk and protective factors, and prevention interventions. The IRDS innovation will target antecedent events specific to Veteran populations prior to the onset of risk to mitigate the development of risk.

The dashboard component is a key feature of the IRDS solution. Within the dashboard, end users such as frontline outreach and intervention specialists, VA leadership, clinicians, and other staff with an interest in suicide outreach and intervention will be able to see data visualizations related to individual at-risk Veterans in addition to groups of Veterans within the overall Veteran population. The solution will provide visual screen elements that will provide quick, intuitive “at a glance” type information, in addition to visual screen elements that will allow users to “deep dive” into the data and create more customized views of the data depending on user preference.

The dashboard’s design is informed by Human Centered Design (HCD) principles and techniques. HCD is a discipline in which “the needs, behaviors, and experiences of an organization's customers (or users) drive product, service, and/or technology outputs.[[1]](#footnote-1)” In the case of IRDS, researchers and designers have used qualitative research techniques, primarily interviewing, to understand how VA users currently do their work today and what they desire from the IRDS, including the dashboard. To that end, the dashboard’s design emphasizes display of information that is directly relevant to the target end user groups’ goals and desired outcomes in their work, in a way that is both easy to access and understand.

## Purpose

The purpose of this document is to describe how the proposed dashboard will be designed. The Dashboard Design Document translates requirement specifications into a document from which the developers can create the actual system. A related document, the System Design Document (SDD), translates requirement specifications into a document from which the developers can create the actual system from a technical and architectural perspective. For more information, please see the [SDD](https://internal.vacloud.us/wiki/pages/81X0Z7X5/Perceptive_Reach_Deliverables.html) at<https://internal.vacloud.us/wiki/pages/81X0Z7X5/Perceptive_Reach_Deliverables.html>

## Scope

The lists below describe what content is considered inside and outside the scope of the Dashboard Design Document.

In scope:

* The visual and functional design of a surveillance dashboard consisting of custom visualization tools that depict the results of analyses conducted by the IRDS, including data trends, events and performance metrics, Veteran demographics, Veteran medical history, etc.
* Data visualizations to include charts, tables, maps, animations, other graphics and visual technology.
* Dashboard configurability, providing different user groups distinct views that meet their business needs.
* Support for interactive viewing and formatting.
* Consideration of user interface (UI) and user experience (UX) matters that will enable the dashboard to present data in a manner that is accessible to a broad range of users

Out of scope:

* End-user characteristic research (to be included in the User Research Report deliverable)
* Descriptions of the IRDS architecture or technical capabilities (to be included in the System Design Document deliverable)

## User Scenarios

There are five user interaction scenarios envisioned for the IRDS: upstream at-risk notification, surveillance, research, reporting, and system sustainment.

1. Surveillance – The primary users in this model shall include VA leadership, VA Center of Excellence for Suicide Prevention staff, VA Mental Health leaders, and VA Suicide Prevention Coordinators. The surveillance dashboard will be available through a standard web browser that will be updated in near real-time (minimum weekly) with results produced from the continuous monitoring and processing of linked data sources.
2. Research – The users in this usage model are researchers and statisticians looking to leverage the tools and data available through Reach data analytics platform. The solution will provide a framework for these users to utilize the interfaces provided by the assembled tools to perform required research functions.
3. Reporting – This model shall include both direct and indirect users. The direct users are the individuals required to assemble reports. The indirect users are the consumers or target audience of the reports. The direct users will utilize the interfaces provided by the assembled tools to assemble reports. The report generation process shall be automated.
4. Sustainment - The Contractor shall provide the capability for users to edit and add to the IRDS Risk Stratification Model, permit creation to new models and mapping to interfaces.

User interaction with the dashboard is broadly described in the “surveillance” scenario above, however it is conceivable that users will access the dashboard in parallel or in conjunction with other interaction scenarios during the course of a regular work day. Additional user research and characteristics are included in the User Research Report.

## Relationship to Other Documents and Plans

The following IRDS documents may be referenced in tandem with the information recorded here:

* [IRDS Requirements Specification Document (RSD)](https://internal.vacloud.us/wiki/pages/81X0Z7X5/Perceptive_Reach_Deliverables.html)
* [IRDS System Design Document (SDD)](https://internal.vacloud.us/wiki/pages/81X0Z7X5/Perceptive_Reach_Deliverables.html)
* [IRDS Requirements Traceability Matrix (RTM)](https://internal.vacloud.us/wiki/pages/81X0Z7X5/Perceptive_Reach_Deliverables.html)
* [IRDS User Research Report](https://internal.vacloud.us/wiki/pages/81X0Z7X5/Perceptive_Reach_Deliverables.html)

## Acronyms and Abbreviations

Table : Acronyms and Abbreviations

| Acronym | Term |
| --- | --- |
| GUI | Graphical User Interface |
| HCD | Human Centered Design |
| HHS | U.S. Department of Health and Human Services |
| ICD | International Statistical Classification of Diseases and Related Health Problems |
| IPT | Integrated Project Team |
| IRDS | Integrated Reach Database System |
| IT | Information Technology |
| PWS | Performance Work Statement |
| RSD | Requirements Specification Document |
| RTM | Requirements Traceability Matrix |
| SDD | System Design Document |
| SPC | Suicide Prevention Coordinator |
| TRM | Technical Reference Model |
| UI | User Interface |
| UX | User Experience |
| VA | Department of Veterans Affairs |
| VACI | VA Center for Innovation |
| VHA | Veterans Health Administration |
| VISN | Veterans Service Area Network |

# Background

## Assumptions and Constraints

### Design Assumptions

No design assumptions have been identified at this time. In accordance with industry standard Agile best practices, the design team will present the design of the dashboard to project stakeholders regularly to garner feedback and better-inform future iterations of the design. As assumptions are identified this section will be updated.

### Design Constraints

* System designers have attempted to utilize open source tools wherever possible. This includes design of the user interface / front end presentation layer of the system, testing tools, and statistical / analytics tools.
* System designers used VA tools approved for use in the VA Technical Reference Model (TRM) or have requested a waiver for any tools not included in the TRM.
* The design team will comply with VA-recommend UI/UX best practices as defined in the project’s RSD.
* The design of the dashboard is both driven and constrained by the data available within the IRDS. As new datasets are incorporated into the IRDS, new design features or data visualizations may be feasible.
* The dashboard must operate within VA-approved web browsers.

### Design Trade-offs

The dashboard’s design must be created using open source tools meaning that adoption of a design based on non-open source or commercial tools is not feasible. In addition, access to the dashboard must be web-based and accessible by VA supported/approved browsers. Therefore, design features must be readable for viewers using standard 1024×768, 1366×768, and 1280×800 screen resolutions. Lastly, given the diverse set of target end users of the dashboard, the design will emphasize configurable features and data visualizations over static displays to enhance user ability to customize dashboard views to their own unique needs.

# Conceptual Dashboard Design

At the highest level a dashboard is “a visual display of the most important information needed to achieve one or more objectives, consolidated and arranged on a single screen so the information can be monitored at a glance.[[2]](#footnote-2)”

In the case of the IRDS dashboard, the “most important information needed” will depend on the role of an individual user (VA leadership, VA Center of Excellence for Suicide Prevention staff, VA Mental Health leaders, VA Suicide Prevention Coordinators, etc.). For this reason, the dashboard design will be configurable based on a user’s role, with individual data visualizations displayed as “widgets” which users can organize spatially on the screen according to their preference. For data visualizations involving one or two variables, widgets with visualizations such as line graphs, bar charts, or circle charts will be available. Other widgets may display information in a tabular format to include more variables. Users will have the ability to filter and sort tables as well as to configure widgets to show data from a specific time frame. For example, a widget that shows suicide rates for a given geographic area will give users the ability to show data from a rolling time frame (“Show me the rate during the previous 6 months”) or a specific time frame (“Show me the rate for months in Fiscal Year 2014”). Individual widgets are described in [Section 4.1](#_Widget_Design).

In addition, the dashboard will feature a navigational hierarchy that allows users to view data aggregated at various levels within the VA enterprise. Frontline outreach and intervention providers will have the ability to view information related to an individual Veteran or facility service area as they wish. Additionally, executive level users will have the ability to view data aggregated at national or regional levels. The navigation hierarchy is described further in [Section 4.2](#_Navigation_Hierarchy).

## Widget Design

Users will have the ability to choose what features they want to see on the screen as “widgets,” while also being able to change the widgets’ size and position on the screen. The following widgets are either in development or under consideration for development in future sprints.

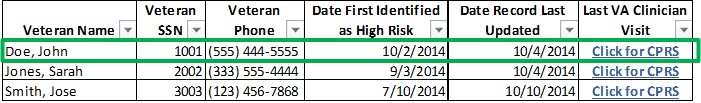


Figure : Veteran Roster

The Veteran roster allows a user to view a list of Veterans within a specific area (service area, state, etc.). It includes a visual indicator to highlight Veterans who have been recently identified – in this case, a green box. The last column represents a tentative user story that allows the user to click a direct hyperlink into the Veteran’s electronic health record. Another future phase story may even include the ability to pull information directly from the health record into the dashboard for a specific Veteran.



Figure : Stratification Widget

The stratification widget allows a user to see how many Veterans within a particular area (state, VISN, etc.) are within a specific risk stratification. In this example, 27 Veterans are in the top .1% of the risk model. Users can click the stratification to view a roster of the Veterans included.

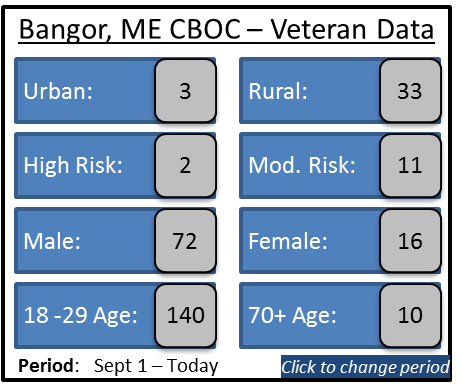


Figure : Attributes Summary Widget

The attributes summary widget provides a list of summary data about Veterans within a specific area (in this case, within the Bangor, ME Community Based Outpatient Clinic’s service area). This widget could be customizable by user to show various summary data attributes related Veteran demographics, location, social and familiar factors, etc.

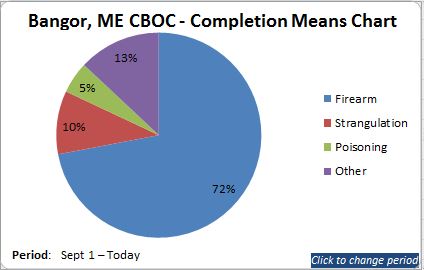


Figure : Means Chart

The means chart shows what percent of suicides were completed by a certain means (firearm, poisoning, etc.) These means are associated with an International Statistical Classification of Diseases and Related Health Problems (ICD) code in the underlying database. Users would be able to see this information for a specific geographic area such as state or VISN.

Figure : Suicide Rate Chart

The suicide rate chart shows the trend of suicide rates over time. Users will be able to make this chart specific to a geographic area, and also be able to specify the time frame displayed.

Figure : Suicide Risk Chart

The suicide risk chart shows the trend for how many Veterans are within certain risk stratification. Users will also be able to specify the time frame and geographic area to define charts of interest to them.

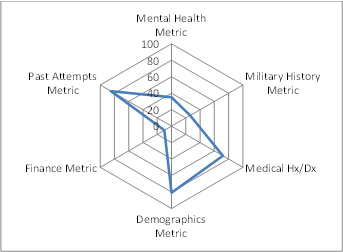


Figure : Risk Snapshot

The risk “snapshot” applies to an individual Veteran. This is a “proof of concept” design, presented as a radar chart that shows a Veteran’s relative risk according to several risk categories. The project’s analytics team is working closely with VA leadership to determine if it is possible to present visualized summaries of risk factors such as this one in a way that is statistically valid and appropriate for frontline providers to view. As these conversations continue this design may be updated or an alternative design created.

## Navigation Hierarchy

The diagram below describes the navigational hierarchy of the proposed dashboard solution. Users will access the dashboard through a standard log-in procedure. Once the application has verified a user’s credentials, he or she will be presented with their default “home screen” view. For example, a Suicide Prevention Coordinator will most likely want to see the Facility Service Area View first, to see the latest data that is directly relevant to his or her work day. An executive level user may want to start with the National View. This setting will be configurable by user role.

Users will have the ability to navigate “up” and “down” through the views. The views at the lowest level of the diagram have the lowest level of data aggregation; that is, the Individual Veteran View will only display data relevant to the specific Veteran selected, but as a user moves up the navigational hierarchy, data aggregation will increase to show data relevant to larger geographical boundaries.



Figure : Navigation Hierarchy

Note that State and Veteran Service Area Network (VISN) are depicted at the same level in the diagram. This is because some VISNs overlap state border lines, while some states, such as Texas, encompass multiple VISNs. Therefore, there is no logical hierarchy between the State and VISN level within the navigation. The design team is currently exploring options for how to best lead users through the navigation hierarchy at this level and will finalize the design in a future sprint.

### Individual Veteran View

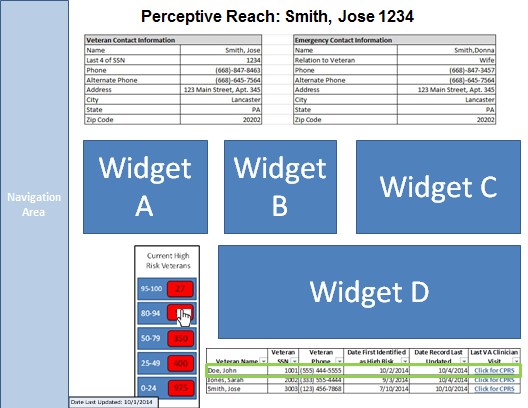


Figure : Individual Veteran View

The Individual Veteran View allows an outreach provider, such as a Suicide Prevention Coordinator (SPC), the ability to view details associated with an individual Veteran’s risk profile. The view will display the Veteran’s contact information in addition to his or her emergency contact information. Displaying this information clearly and prominently is a key feature, as an outreach provider will want to frequently access Veteran contact information (especially phone number) during the course of their regular work.

The GUI will also include screen elements to allow users to either view a different Veteran in their facility service area by clicking a different Veteran’s name via the Roster widget. The user will then be able to navigate to view a different individual Veteran in the roster or navigate up to the Facility Service Area View.

### Facility Service Area View

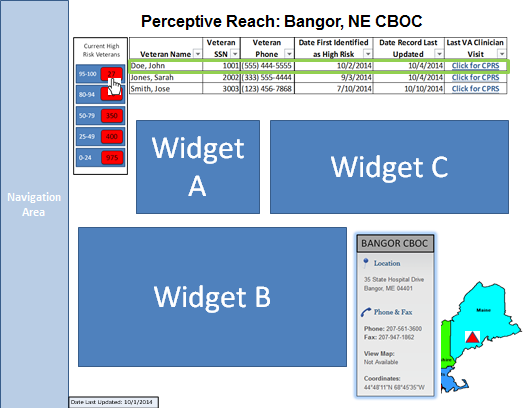
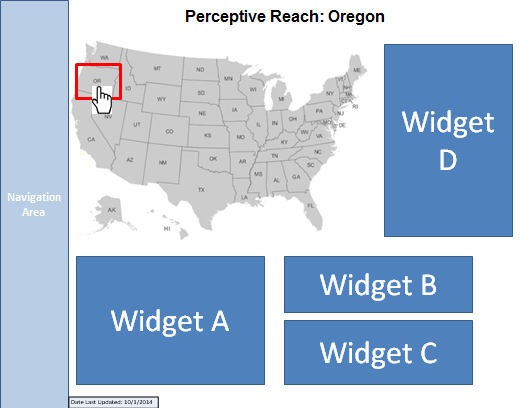


Figure : Facility Service Area View

The Facility Service Area View allows an outreach provider, such as an SPC, the ability to view summary data of Veterans who are within the catchment of a specific facility. The GUI will include screen elements to allow users to either view a different Veteran in their facility service area, or view the number of Veterans stratified by risk level within the risk model’s results. Displaying this information clearly and prominently is a key feature, as an outreach provider will want to frequently view the details for an individual Veteran in their Facilities Service Area. Users will also be able to navigate up a level to the State or VISN View.

The rest of the GUI has features related to the current Veterans with the facility’s service area. Widgets could include (as customized by the user) a summary of prominent Veteran risk factors, a cause of death chart for completed suicides (based on ICD codes associated with a Veterans death in the underlying database), and suicide rate by month, quarter, or other time constraint depicted as a line chart. The facility’s contact information will also be presented in the view. All of these widgets have the ability to be moved around the screen and organized by the user.

### State / VISN View



**Figure 11: State View**

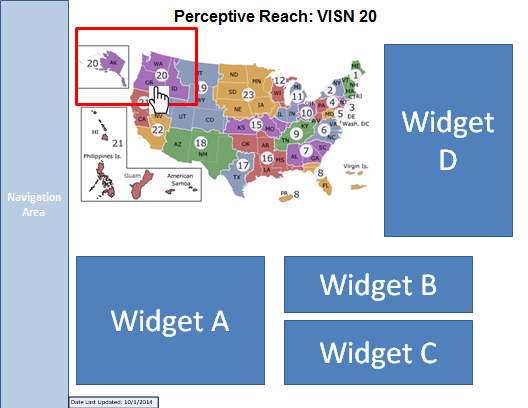


Figure : VISN View

The State/VISN View gives users the ability to view visualizations of data related to Veteran suicide within a specific VISN or state. From this screen, users will be able to customize their screens by selecting and rearranging widgets in the same manner as described in the Facility Service Area View. Widgets could include (as customized by the user) a summary of prominent veteran risk factors, a cause of death chart for completed suicides, and suicide rate by month, quarter, or other time constraint depicted as a line chart.

Both the State and VISN views will offer similar if not identical functionality, but data will be aggregated across all of the zip codes of a state or zip codes of a VISN, respectively.

### Regional View

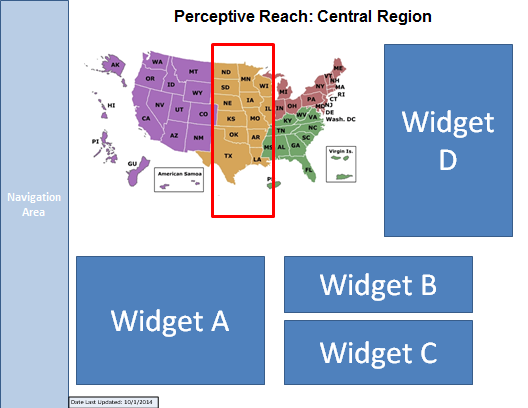


Figure : Regional View

The Regional View gives users the ability to view visualizations of data related to Veteran suicide within one of VA’s four regions across the country (Western, Eastern, Southern, Central). Users will be able to navigate “up” to the National View or “down” to the State / VISN view. Otherwise, functionality and widget-selection will be similar to that at the State / VISN view, only with data aggregated to regional levels.

### National View

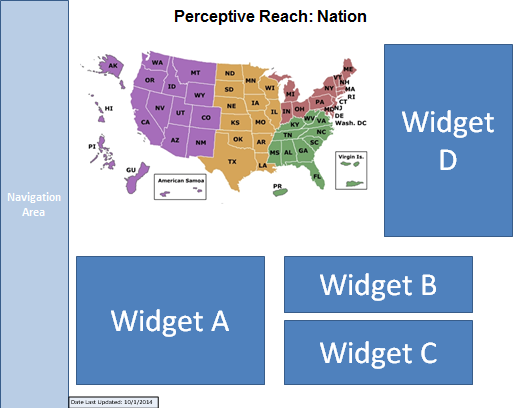


Figure : National View

The National View gives users the ability to view visualizations of data related to Veteran suicide nationally. Users will be able to navigate “down” to the Region view. Otherwise, functionality and widget-selection will be similar to that at the lower views, only with data aggregated to national levels.

1. PWS for VA Contract No. VA118-14-C-0046 [↑](#footnote-ref-1)
2. Stephen Few (March 20, 2004) “Dashboard Confusion” *Intelligent Enterprise.*  [↑](#footnote-ref-2)