

# Department of Veterans Affairs

*Veterans Enterprise Management System*

## Draft System Design Document

**CLIN 0004AA**



**December 2013**

**Version 0.1**

## Revision History

Date	Version	Description	Author
12/10/2013	0.1	Initial Draft	FirstView Federal TS

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# 1. Introduction

This document outlines the proposed system design for the new evaluation examination and verification platform referred hereafter as the Veterans Enterprise Management System (VEMS) as designed to accommodate the Office of Small and Disadvantaged Business Utilization (OSDBU) for the Department of Veteran’s Affairs (VA). This document is based on the VA-One technical reference standards and the (Document (SDD) template required as a PMAS deliverable for Milestone One of the ProPath project management methodology.

## 1.1.Purpose of this document

The purpose of this document is to describe in sufficient detail how the proposed system is to be constructed. The System Design Document translates the Requirement Specifications into a document from which the developers can create the actual system. It identifies the top-level system architecture, and identifies hardware, software, communication, and interface components.

## 1.2.Scope

This solution incorporates elements of Commercial of-the-Shelf (COTS) software to provide the following functionality:

**Table 1 Scope Inclusions**

<b>Includes</b>
Customer Relationship Management (CRM)
Decision Support
Performance Monitoring
Secured Data Management
Electronic Signature
Optical Character Recognition (OCR)
Document Management
Data Validation
On-line Reporting
E-mail and letter generation
Mail Merge
Web Chat
On-line Collaboration
Standardized and customized rule based workflow processing

Data integration through secured web services
User authentication and authorization
Cisco VoIP
<p>Additionally, the solution will integrate data from the following systems using the services-based data integration system:</p> <ul style="list-style-type: none"> <li>• Benefits Gateway Services (BGS) <ul style="list-style-type: none"> <li>○ Beneficiary Identification Records Locator Subsystem (BIRLS)</li> </ul> </li> <li>• Defense Manpower Data Center (DMDC)</li> <li>• Master Veteran Index (MVI)</li> <li>• DS Logon</li> <li>• System for Award Management (SAM) <ul style="list-style-type: none"> <li>○ Excluded Parties List System (EPLS)</li> <li>○ Central Contractors Registry (CCR)</li> <li>○ Online Representations and Certifications Application (ORCA)</li> <li>○ Federal Agency Registration (FedReg)</li> </ul> </li> <li>• Correspondence Tracking System</li> <li>• Dun and Bradstreet (D&amp;B)</li> <li>• LexisNexis</li> <li>• Experian</li> <li>• Westlaw</li> </ul>

**Table 2 Scope Exclusion**

Excludes
Enhanced modeling and simulation (M&S) capabilities are not part of the initial project base period
Mobile development is an optional task for later stages of the project

The following integrations are currently considered optional tasks:

- Federal Procurement Data System (FPDS)
- Electronic Contract Management System (eCMS)
- Contractor Performance Assessment Reporting System (CPARS)
- Past Performance Information Retrieval System (PPIRS)
- Small Business Administration (SBA)
- Dynamic Small Business Search system (DSBS)
- USA spending.gov
- Disability Evaluation System
- The National Cemetery Administration's Veteran Death Notification System (VDNS)
- Internal Revenue Service (IRS)
- VetGov Partner (VGP) portal
- Enterprise Voice Solution (EVS)
- Equifax Credit Reporting Services
- TransUnion Credit Reporting Services

## 1.3. Relationship to Other Plans

Additional documents referenced in the creation of this system design document are listed below:

- VEMS To-Be Process Workflow v0.2
- VEMS DB schema v0.1
- VEMS Data Dictionary v0.1

As an enterprise solution, VEMS has and must accommodate inter-system dependencies. These dependencies are managed through the requirements process, IPT meetings, alignment with the VA Technical Reference Model, and alignment with the VA Enterprise Architecture. This project will have key dependencies with the following independent programs:

- **VA Identity Access Management (IAM)**-This project will be dependent upon services available from the IAM group at the time of implementation, with focus on Active Directory Federated Services and future support for HSPD12 PIV authentication. The project will also be dependent on the availability to leverage existing authentication services for external users developed by other VA projects such as My HealthEVet.
- **Benefits Gateway System (BGS)**-The project will look to leverage services provided by BGS for Veteran Identity and Veteran Disability information. Alignment with the latest systems such as the Master Veteran Index (MVI) will ensure the project leverages the most authoritative data source. Based upon the project schedules for BGS will determine whether integration with BIRLS will be required for disability information.

## 1.4. Methodology, Tools, and Techniques

The VEMS project will employ the Agile Scrum Methodology for the software development lifecycle (SDLC). Scrum provides a flexible, iterative development lifecycle, where releases will be generated every two to four weeks in what are known as sprints. This process allows for refinement of requirements and design over the entire SDLC. This framework also allows for a highly transparent and cooperative process with the stakeholders, providing a better sense of project progress than a more traditional waterfall approach. User Stories are used as the functional design definitions that the team will work on, which are added to a backlog that is prioritized based on stakeholder priority and technical need.

The VEMS project will use the Atlassian OnDemand tool set for the tracking of user stories, managing the sprints, backlog, and also any issues or change requests.

The VEMS project will use the Atlassian BitBucket service for source code management, which allows for use of the Git software distributed version control system.

The VEMS project will use the Zephyr test case management system for the capture of requirements and test cases. Zephyr is fully integrated with the Atlassian OnDemand suite to allow for proper traceability between work efforts and requirements.

## 1.5. Policies, Directives and Procedures

The VEMS solution is designed to operate in accordance to VA policies, directives, and procedures for Information Assurance (IA), Privacy, and Records Management. In addition, VEMS will adhere to emerging standards for Cloud Computing and Mobile Security technologies Enterprise Technical Architecture (ETA) requirements, and the Data Architecture



Repository (DAR). These alignments include ongoing IPT coordination and data-centric deliverables.

Constraining Policies, Directives, and Procedures for VEMS include:

- Federal Information Security Management Act (FISMA) of 2002;
- VAAR 852.273-75 Security requirements for unclassified information technology resources (interim Oct 2008);
- FIPS Pub 201, Personal Identity Verification for Federal Employees and Contractors, February 25, 2005;
- Section 2224 of title 10, United States Code, "Defense Information Assurance Program"
- Software Engineering Institute, Software Acquisition Capability Maturity Modeling (SA CMM) Level 2 procedures and processes;
- Privacy Act of 1974
- Title VI of the Civil Rights Act of 1964
- Department of Veterans Affairs (VA) Directive 0710 dated September 10, 2004
- Department of Veterans Affairs (VA) Directive 6102
- Department of Veterans Affairs (VA) Handbook 6102 (Internet/Intranet Services)
- Health Insurance Portability and Accountability Act (HIPAA); 45 CFR Part 160, 162, and 164; Health Insurance Reform: Security Standards; Final Rule dated February 20, 2003
- Electronic and Information Technology Accessibility Standards (36 CFR 1194)
- OMB Circular A-130
- U.S.C. § 552a, as amended
- 32 CFR 199
- An Introductory Resource Guide for Implementing the Health Insurance Portability and Accountability Act (HIPAA) Security Rule, March 2005
- Sections 504 and 508 of the Rehabilitation Act (29 U.S.C. § 794d), as amended by the Workforce Investment Act of 1998 (P.L. 105-220), August 7, 1998
- Homeland Security Presidential Directive (12) (HSPD-12)
- VA Handbook 6500
- OED ProPath Process Methodology
- NIST SP500-153, "Guide to Auditing for Controls and Security: A System Development Life-Cycle Approach," April 1988
- Program Management Accountability System (PMAS) portal
- [Federal Travel Regulation \(FTR\)](#)
- NIST SP 800 145, "The NIST Definition of Cloud Computing"
- "Federal Mobile Security Baseline", Federal CIO Council, May 23, 2013 (or latest version)
- "Mobile Security Reference Architecture", Federal CIO Council and the Department of Homeland Security (DHS), May 23, 2013
- FedRAMP (Federal Risk and Authorization Management Program)
- NIST SP 800-53, Rev 3
- FIPS 140-2

A large portion of constraints directly address IA compliance needs for the VEMS solution. IA policies and procedures for VEMS must follow the information security program practices outlined in VA Handbook 6500 that also provides mandatory security controls to be applied against the VEMS architecture and design. VEMS will also achieve an Authority to Operate (ATO) at the FISMA Moderate assurance category at the application layer and a FedRAMP Moderate ATO at the infrastructure layer hosted by a FedRAMP accredited Cloud Service Provider. The FISMA and FedRAMP underlying frameworks are based on NIST SP 800-53 security control standards and guidelines along with cloud computing controls defined in NIST SP 800-145. VEMS will follow additional security constraints to handle the design needs for mobile interfaces to the application from the “Federal Mobile Security Baseline”, and “Mobile Security Reference Architecture” both published by the Federal CIO Council and DHS. OMB Circular A-130 is another publication as a VEMS constraint that covers guidelines for system security plans, emergency response plans, security awareness and training plans, and operational security requirements. Lastly, auditing guidelines for performing regular security assessments of the VEMS solution SDLC will follow guidelines from the NIST SP 500-153 “Guide to Auditing Controls and Security”.

Protecting the privacy of data that VEMS will be managing whether it is transactional, unstructured, or meta-data is of utmost importance to VEMS system design and functionality, and there are both privacy and data security constraints that must be followed. VEMS will be managing large sets of Personally Identifiable Information (PII) that will be handled under privacy laws and guidelines described in the Privacy Act of 1974. Furthermore, while VEMS may not process any Protected Health Information (PHI), the VEMS contract is still responsible under the T4 PWS to ensure HIPAA security rules and standards are followed for handling any PHI. Moreover, ensuring data security for VEMS requires numerous protections in how the data is processed at rest, in use, and in transit utilizing strong FIPS 140-2 approved encryption. VEMS will incorporate least privilege data access rules with role-based access controls, and strong identification, authentication, and authorization controls implemented for system users by applying HSPD-12 and FIPS Pub 201 constraints.

One of the main goals of the VEMS solution is to replace the lack of data integration services of the legacy system to a new architecture that can interface with common data services and follow constraints of the Data Architecture Repository (DAR) Enterprise Technical Architecture Compliance Criteria. VEMS will integrate with the VA Common Data Model and other key components of the VA Data Enterprise Architecture.

Further, VEMS has been aligned with the OneVA Enterprise Technical Architecture as follows:

**Table 4: Alignment of VEMS with VA Enterprise Technical Architecture**

ETA Criteria	ETA Sub-Criteria	VEMS Alignment
<b>Mission Alignment</b>	Veteran Centric Solution	VEMS supports the veteran directly through certification of Veteran-Owned Small Businesses and Service Disabled Veteran-Owned Small Businesses

ETA Criteria	ETA Sub-Criteria	VEMS Alignment
<b>Mission Alignment</b>	Business Architecture	VEMS was designed to provide a secure and stable environment for veterans' applications handling. VEMS uses mainstream architecture and VA enterprise software like Dynamics and SharePoint to perform core functions.
<b>Data Visibility and Accessibility</b>	N-Tier Architecture	VEMS provides programming language and operating system agnostic web services to provide data to those approved to view it. VEMS follows a 3-tier architecture that separates the data presentation, business rules and data storage to make enhancements and troubleshooting less disruptive to the overall solution. The layers use asynchronous components and events and many times are coupled with web services.
<b>Data Visibility and Accessibility</b>	Data Independence	The application and data are separated into layers; transactions are governed by commits and rollbacks.
<b>Data Visibility and Accessibility</b>	Common Look and Feel	VEMS web site design is based on HTML5. It is designed and architected with input from a cross functional workgroup.
<b>Data Visibility and Accessibility</b>	Data Persistence	All VEMS data, including data accessed by all VEMS developed applications are stored on approved VA servers.
<b>Data Visibility and Accessibility</b>	Test Driven Development	Unit tests have been developed for web services where appropriate.
<b>Data Visibility and Accessibility</b>	Exception Handling	There is extensive use of TRY/CATCH exception handling throughout the web site and ancillary code as well as in the OCTS products.
<b>Data Visibility and Accessibility</b>	Scalability	VEMS applications can scale out. VEMS is load balanced and more servers/VMs can be added as needed.
<b>Data Visibility and Accessibility</b>	Stateless Business Logic	User interaction and session information is not stored within business logic.
<b>Data Visibility and Accessibility</b>	Accessibility	VEMS services and application fully meet Section 508 requirements.
<b>Data Interoperability</b>	Data standards	All data stored in VEMS adhere to and follow the standards set for the VA systems.
<b>Data Interoperability</b>	Authoritative information sources	All VEMS data follow the VA standards, with the VA systems as the authoritative data source. Reuse of data design from VRM and FCMT enhances these criteria.
<b>Data Interoperability</b>	Enterprise data model	All VEMS data follow the VA standards.

ETA Criteria	ETA Sub-Criteria	VEMS Alignment
<b>Data Interoperability</b>	Local copies of data	VEMS uses VEMS-specific copies of data as necessary but leverages VA authoritative data stores for external data that is fetched real-time.
<b>Data Interoperability</b>	Meta Data Registry	All VEMS data are documented with metadata and can be published as required.
<b>Infrastructure Interoperability</b>	Cloud first	VEMS will be cloud hosted with enterprise SLAs to ensure performance and availability.
<b>Infrastructure Interoperability</b>	Standard OS images	VEMS will use standard images as part of the cloud model and provide offsite backup of these images for rapid restoration.
<b>Infrastructure Interoperability</b>	Standard databases	All VEMS database platforms, including hardware, operating system, middleware, databases, and supporting system software conform to the VA Standard Databases. VEMS uses Microsoft Windows Server operating system and SQL Server databases.
<b>Infrastructure Interoperability</b>	Virtualization	VEMS evaluates the requirement of each application and determine the best placement, either as a physical or Virtual machine. VEMS uses virtualization technology.
<b>Infrastructure Interoperability</b>	Infrastructure capacity	VEMS capacity is planned, tested, and provided by cloud host SLAs.
<b>Infrastructure Interoperability</b>	Storage	Storage requirements are based on historical usage and incoming data request to determine our future growth. Database Administrators (DBA) carefully monitor usage and provide future growth projections.
<b>Infrastructure Interoperability</b>	Network Configurations	VEMS network devices will be configured to industry best practices and servers configured to communicate on Ethernet VLANs (Virtual Local Area Networks).
<b>Infrastructure Interoperability</b>	System monitoring	System monitoring, reporting, and improvement will be provided under SLA by the VEMS cloud host.
<b>Infrastructure Interoperability</b>	Disaster recovery	VEMS does not affect patient care so it is not classified as critical system. Only the data is located at multiple physical locations. Core DR functions will be provided under SLA by the cloud host.
<b>Infrastructure Interoperability</b>	Backup and restore	Core DR functions will be provided under SLA by the cloud host.

ETA Criteria	ETA Sub-Criteria	VEMS Alignment
<b>Infrastructure Interoperability</b>	Thin client	VEMS utilizes web technologies where possible. Where client applications are required, they are presented to the user through desktop virtualization, keeping the thick client components centralized.
<b>Information Security</b>	Security regulations	VEMS will obtain ATO by submitting all necessary C&A documentation.
<b>Information Security</b>	External hosting	VEMS will be cloud hosted and interact with multiple external systems per the architecture diagrams continued.
<b>Information Security</b>	Secure access paths	The security access is being managed by Active Directory which specific security access can be given to a specific user to a specific set of data.
<b>Information Security</b>	Secure information sharing	Data access is being managed by Active directory that audits access to the server to the event logs. Only approved users with VA account can access the system.
<b>Information Security</b>	PII and PHI	Sensitive Data will be managed and tracked at the data level. Only approved users are allowed access to sensitive information.
<b>Information Security</b>	HSPD-12	VEMS closely follows the VA PKI initiative and deploy when the infrastructure is ready.
<b>Enterprise Services</b>	System integration	VEMS follows the strict standard of OIT implementation. The VEMS website will use standard HTML5 and in order to access VEMS workspace securely, it will employ HTTPS protocol to provide encrypted access to the environment. VEMS will leverage BGS and MVI services (potentially the Virtual Lifetime Electronic Record [VLER]) to act as a service consumer in Service Oriented Architecture (SOA).
<b>Enterprise Services</b>	Service registry	VEMS will consume and provide (as necessary) services to/from the registries. (UDDI)
<b>Enterprise Services</b>	Shared enterprise services	We develop local services in the case of a request denial or if a request cannot be fulfilled
<b>Enterprise Services</b>	IAM	VEMS authenticates all users via Active Directory and Kerberos. Each user must obtain a VA account and approval from their management to access VEMS.
<b>Enterprise Services</b>	VLER Information Services	TBD

ETA Criteria	ETA Sub-Criteria	VEMS Alignment
Enterprise Services	Service Enabled Information Sharing	TBD
Enterprise Services	TRM	All VEMS products have been reviewed to be on the Technical Reference Model (TRM) or have an exception filed. VEMS mainly uses Microsoft (MS) products, MS SQL, and other COTS.
Enterprise Services	COTS Products	All the production software is either on the TRM or has an exception filed for use in production environment. We retire older versions of the software when new versions are applied due to supportability of older version.

## 1.6.Constraints

While risks are always present, it is expected that VEMS solution risks will be managed and monitored by tracking them in a separate project Risk Log. From a technical perspective, the VEMS solution will have constraints by following the policies of the VA's TRM and also use commonly available, up-to-date programming tools, interfaces, and languages.

Specifically, the solution will be deployed on TRM approved software for both the application, platform, system, and user endpoints including the following COTS products:

- All server-side technical constraints will be covered under the cloud provider service level agreements (SLAs) in compliance with VA security and performance requirements
- Windows 7 Client Operating System
- Windows Virtualization Desktop Infrastructure (VDI)
- Microsoft Office, including Outlook
- Microsoft SharePoint
- Microsoft Dynamics CRM
- Web Browsers, specifically recent versions of Internet Explorer, Firefox, Chrome, and Safari
- Adobe Acrobat PDF reader
- Citrix Virtual Desktops
- Cisco's Unified Call Connector
- Microsoft's SQL Server (including SQL Server Reporting/Analysis Services)
- Commercially available plug-ins to the Microsoft dynamics CRM platform such as Auto Merge, Documents CorePack, PowerPivot, zoetrope Corporation's site 24 x 7 and Trillium Software's TS Quality OCR software, and AlphaTrust Pronto

## 1.7.Design Trade-offs

The design of the VEMS solution focuses on five key dynamics:

- **Flexibility**–The system shall provide the end-user the flexibility of collecting, analyzing, and reporting on data relevant to the OSDDBU business unit responsible for evaluation and verifying compliance – the Center for Verification and Evaluation (CVE). The VEMS solution will assist the CVE mission by using rule-based workflow management software that integrates with a variety of commonly available software tools. This flexibility will be provided through the use of:
  - SOA to enhance the extensibility, maturation, and ongoing enhancements of enterprise services;
  - COTS interfaces to maximize the use of invested COTS products such as CRM Dynamics and SharePoint;
  - HTML/CSS3 custom web interface to ensure browser utilization and platform agnosticism;
  - Proper inter-layer abstraction to allow for the modernization of certain components without causing VEMS system-wide obsolescence.
- **Interoperability**–The solution, being based on COTS software, will be loosely coupled and operate such that new data sources or new data outputs can be integrated using commonly- available, standards-based, and secured data interfaces to minimize integration costs. Where COTS components provide proprietary interfaces, VEMS will use, build, or extend interfaces to align with VA-adopted standards to ensure loose coupling as a core tenet of the architecture. VEMS will leverage the lessons learned from VRM and FCMT implementations of Dynamics, maximize the use of enterprise services, align with the ETA, and adhere to well-established SOA design principles and patterns to the maximum extent possible. Information exchanged via data services will adhere to the VA’s enterprise data payload standards for data elements that are already defined. If such standards do not exist, the project team will forward them for consideration to the proper VA’s SOA Governance committees.
- **Performance**–The solution must be able to expand to accommodate an increased caseload by the end-users. This performance will be provided through cloud service provider SLAs. Key Performance Indicators defined by the CVE team for important metrics such as data quality, responsiveness, security and others concerns. As the end user community grows, the SLAs can be enhanced via leveraging the cloud platform’s characteristics to extend horizontally, vertically, or geographically to meet the performance load.
- **Reliability**–the system should be available 24/7 with minimal unplanned downtime and utilize infrastructure designed for high-availability and disaster recovery planning commensurate with the to-be-defined service level agreement with the cloud hosting provider. The cloud provider will offer SLAs and guarantee VEMS uptime to 99.9% with fiscal penalties should these parameters ever not be met or exceeded.
- **Robustness**-The VEMS system will benefit from the robust dynamics of the cloud platforms and the extension of best design practices and patterns from the VRM and FCMT initiatives. By implementing a largely COTS solution and aligning with other VA COTS CRM initiatives, VEMS will benefit through critical mass and ensure the platforms ability to handle typical errors for case management, user interaction, security and other categories.
- **Usability**–The solution will follow commonly accepted user interface conventions and comply with VA guidelines on usability (including section 508 compliance of the

Americans with Disabilities Act). Further, VEMS is being designed by subject matter experts in User Experience engineering throughout its lifecycle to ensure high usability for the defined user groups.

In accordance with and to support the above criteria, the following core products and/or technologies have been chosen to develop the VEMS solution. For each, the selection criteria most relevant to this architecture artifact have been itemized. To review these components with their alignment with the project’s requirements, please refer instead to Table 6.

**Table 5: Software Components and Relevant Selection Criteria**

<b>Software Component or Subcomponent</b>	<b>Relevant Selection Criteria</b>
<b>Microsoft Dynamics CRM</b>	Robust, proven, VA-defined platform to provide overarching case management. Designed for high-volume environments with enhanced security and usability requirements (including Section 508 compliance)
<b>Web Browsers (Internet Explorer, FireFox, and Safari)</b>	Web-based solution to ensure maximum conformance to heterogeneous application platforms. Built with HTML5/CSS3 to support mobile enablement in the future and to offer browser interoperability with minimal enhancement efforts.
<b>Microsoft Email Router for CRM</b>	Proven email interface for Dynamics, also already in use by VA in other projects
<b>Microsoft Exchange</b>	The VA’s preferred enterprise solution for electronic mail and calendar management.
<b>CRM Dynamics add-ons to include SSRS, SSAS, SSIS, AutoMerge, WhosOn Live Chat, etc.</b>	Products under final determination to align with the project’s baselined requirements. All selected products will meet VA EA, ETA, TRM, and other requisite criteria.
<b>Microsoft Active Directory and Active Directory Federated Services</b>	Authentication and Authorization through VA-approved means to ensure proper Role Based Access Control (RBAC) and other necessary access controls. MVI integration will ensure alignment with VA EA while meeting all IA controls necessary.
<b>Adobe Acrobat Reader/ Acrobat Pro</b>	Use of PDF documents for full platform extensibility. COTS product for robustness, reliability, and standards-based document implementation.
<b>Microsoft SharePoint</b>	A standards-based document and content repository integrated into Dynamics
<b>Cisco Universal Call Connector</b>	VA chosen component to align with VRM, FCMT, and VA Cisco standards.
<b>AlphaTrust Pronto (or functional equivalent)</b>	COTS solution integrated with Dynamics to allow for digital signatures.
<b>Cisco XenApp Virtualization Server</b>	Virtualized desktop solution already in use in VA
<b>Microsoft LiveMeeting (or Lync)</b>	Messaging solution in use by VA and universally available outside VA. Well integrated with CRM and



	SharePoint components.
<b>Microsoft SQL Server and SQL Server Reporting Services</b>	Database already VA supported, integrated with other COTS components

## 1.8. User Characteristics

The characteristics of the end-user community are office professionals familiar with logging into secured workstations and online web sites, operating the Microsoft office product suite, e-mail systems, Voice over Internet Protocol (VOIP) telephone systems, document management systems such as Microsoft SharePoint, and searching for and collecting online information through internal and external websites using web browsers such as Microsoft's Internet Explorer, Mozilla's Firefox, or Google Chrome.

The characteristics of the technical community are system administrators familiar with remote administration of cloud and/or virtualized systems, implementing security measures in accordance with VA regulations, 24x7 system monitoring, system backups, familiarity with administering Windows servers, Microsoft Dynamics CRM, SQL Server, SQL Server Reporting Services, IIS Web Server, SharePoint, Exchange, integration with Active Directory Federated Services and IP based phone systems, and supporting web services.

### 1.8.1. User Problem Statement

The end-user community struggles with the following challenges:

- **Navigation** – navigation is not intuitive and access to information is not user-friendly. Too many clicks and separate interfaces to obtain information. This often causes much of the useful information to be unused due to inconvenience
- **Excel** – use of Excel to manually track progress and deadlines
- **NAICS codes** – inability to update the current North American Industry Classification System (NAICS) in the current tool. The NAICS code database used in VCMS is from 2011.
- **Alerts** – inability to alert responsible users when actions are due and need to be completed
- **Multiple databases** – data integrity and access issues due to multiple independent databases for case management
- **Business capabilities** – a lack of ad hoc reporting capabilities, limited pre-defined reports, and a dashboard that is not modular or configurable
- **Storage** – a lack of centrally managed, well-structured storage of documents and information gathered during the verification process
- **Monitoring capabilities** – a lack of monitoring capabilities of the verification processes to provide situational awareness/status for VA Senior Leadership

- **Automated communication** – a lack of automated communications and a reliance on manual communications without integration to collaboration tools that provide text chat, desktop sharing and multimedia conferencing
- **Customer tracking capabilities** – a lack of customer relationship management (CRM) and tracking capabilities to enable quality control (QC)
- **Automated rules intelligence** – a lack of built-in system intelligence / rules processing to automatically identify cases when Service Disabled Veteran Owned Small Business (SDVOSB/VOSB) applicants do not meet regulations, and a lack of automation to alert Office of Small Disadvantaged Business Utilization (OSDBU) CVE staff of such violations
- **Automated risk intelligence** – a similar lack of automatic identification when there are issues or risks that warrant a site visit to SDVOSB/VOSB applicants
- **Automated letter generation** – a lack of automated letter generation capability for official rejection/denial letters that include the regulations where applicants are non-compliant
- **Trouble ticket capabilities** – a lack of any trouble ticket capability to capture and track issues and resolutions
- **Standardized correspondence** – the inability to standardize correspondence and communication with applicants and their designated proxies or other stakeholders
- **Tracking** – the inability to track, assign and monitor issues related to the verification process in a timely manner
- **Auto assignment** – the inability to auto assign the assignments based on user load to initiate an application process
- **Auto acknowledgement** – the inability to get an auto acknowledgement when a business owner receives an email notification
- **Master Inventory List (MIL) capabilities** – the inability to verify MIL on a daily basis
- **Automated appeals information** – the inability to automatically list or delist a company based on the appeal findings

### 1.8.2. User Objectives

The users' objectives for the new system are:

- Provide integrated CRM capabilities between the Contact Center and applicants, supporting staff communications with the public. This includes integrating telephony, email, and web interface capabilities.
- Support the creation of an automated workflow with configurable business rules to process and track verification application cases, inquiries, and work assignments.
- Provide, support and manage data, including documents, associated with new cases, users and solution operations.

- Provide the capability to automatically populate and manually edit the contents of letters that VA produces throughout the Verification process and include e-Signature capabilities.
- Provide standard reports and dashboards for overall case processing, call handling, and each major verification process. Ad hoc queries shall be supported.
- Provide a user interface to replace the functionality in the current VIP/VCMS interface while integrating all required VEMS capabilities. This includes providing a new public web portal for applicants in accordance with VA Handbook 6102 to replace the current VIP web portal ([www.vip.vetbiz.gov](http://www.vip.vetbiz.gov)).
- Develop online help content for capabilities not already documented through COTS online help content. This includes integrating VA supplied help content, such as FAQs.

## 2. Background

### 2.1. Overview of the System

The challenges faced by the OSDDBU/CVE operations team are addressed by the new VEMS solution using a combination of COTS software integrated into the verification process through the use of virtualized desktops and cloud-based software. These COTS products leverage market-tested products that are currently listed as enterprise solutions in the VA environment and are in compliance with the VA's technology standards for enterprise-class software.

The VEMS solution will address the challenges outlined in section 1.10 by providing an internet-facing portal for submitting data and tracking the progress of the verification team as well as an integrated CRM system with strong document management, collaboration, notification, and reporting functionality in alignment with the security requirements dictated by the collection, capture, and distribution of sensitive material. The new system design will provide these capabilities using:

- A COTS-based customer CRM to capture and collaborate using a customer-centric business model
- A documentation library system including version control and automatic notification of document updates and other important events
- Optical Character Recognition (OCR) engines to integrate scanned data into the CRM framework
- A robust computer telephony integration for call center representatives that provides queue management, call monitoring, and integrates into the CRM framework
- COTS software components for automatically generating customizable correspondence for hard copy and email correspondence
- COTS software for capturing and storing electronic signatures for significant correspondence
- Personalized business intelligence dashboards for monitoring critical business processes
- A configurable workflow engine that monitors case loads and time periods across the verification process

- Virtualized desktops with integrated email and office productivity software to minimize data leakage
- A service-oriented architecture for consistent data integration using VA-centric and external data suppliers
- An internet-facing portal platform for collecting and distributing information to the veteran(s) and other future stakeholders
- A cloud-hosted solution to provide a reliable infrastructure, on-demand system scalability, and consistent system patching mechanisms.

The following table lists the specific COTS software to be integrated into the VEMS solution at the time of this publication as well as the corresponding requirements listed in the Performance Work Statement (PWS) and the supplemental requirements listed in the RFP as Appendix B. Please refer to those documents for further elaboration. The remainder of this section defines how these components operate to provide business functionality and value in alignment with the critical dimensions of the CVE business cases.

Note: As further requirements are clarified and prioritized, some items on this list may change (and such changes will be reflected via updates to this and associated documentation).

**Table 6: Mapping Requirements to Proposed COTS Products**

<b>PWS REQUIREMENTS</b>	<b>Proposed COTS Product</b>	<b>Appendix B Requirements</b>
<b>Customer Relationship Management</b>	<ul style="list-style-type: none"> <li>• Microsoft Dynamics CRM</li> <li>• Bucher-Suttor Connector for Microsoft Dynamics CRM</li> <li>• WhosOn Live Chat Software for Microsoft Dynamics CRM from PARKER software</li> </ul>	CRM 1, 7-11 CRM 2-6
<b>Workflow and Queue Management</b>	<ul style="list-style-type: none"> <li>• Microsoft Dynamics CRM</li> </ul>	WFLOW 1 - 17
<b>Data - Document Management</b>	<ul style="list-style-type: none"> <li>• SharePoint</li> <li>• Microsoft Dynamics CRM</li> </ul>	DAT-DOC 1-8
<b>Data – Data Management</b>	<ul style="list-style-type: none"> <li>• Scribe Insight form Scribe Software Corporation</li> <li>• PowerSearch for Microsoft Dynamics CRM</li> <li>• AttachmentExtractor for Microsoft Dynamics CRM</li> </ul>	DAT 1-13
<b>Data - Validation &amp; Optical Character Recognition (OCR)</b>	<ul style="list-style-type: none"> <li>• Microsoft Dynamics CRM Scanner and OCR plug-in</li> <li>• TS Director and TS Microsoft Dynamics CRM Connector from Trillium Software corporation</li> </ul>	DAT-VAL 1-10.1

<b>PWS REQUIREMENTS</b>	<b>Proposed COTS Product</b>	<b>Appendix B Requirements</b>
<b>Letter Generation</b>	<ul style="list-style-type: none"> <li>• AutoMerge for Microsoft Dynamics CRM</li> <li>• DocumentsCorePack for Microsoft Dynamics CRM</li> <li>• AlphaTrust Pronto</li> </ul>	LTR 1-5
<b>Monitoring &amp; Decision Support – Query</b>	<ul style="list-style-type: none"> <li>• SQL Server Reporting Service (SSRS)</li> </ul>	MON-Query 1-4
<b>Monitoring &amp; Decision Support – Reports</b>	<ul style="list-style-type: none"> <li>• SQL Server Reporting Service (SSRS)</li> </ul>	MON-RPT 1-2
<b>Monitoring &amp; Decision Support – Dashboard</b>	<ul style="list-style-type: none"> <li>• Microsoft Dynamics CRM</li> <li>• SQL Server Reporting Service (SSRS)</li> </ul>	MON-Dash 1-3.4
<b>Monitoring &amp; Decision Support – Alerts</b>	<ul style="list-style-type: none"> <li>• Microsoft Dynamics CRM</li> <li>• Cisco Unified Contact Center Enterprise (UCCE) – provided by VA</li> <li>• Bucher-Suttor Connector for Microsoft Dynamics CRM</li> <li>• Cloud Monitoring – provided by the cloud hosting provider</li> </ul>	MON-Alert 1-3
<b>Monitoring &amp; Decision Support-Business Analysis</b>	<ul style="list-style-type: none"> <li>• Microsoft Dynamics CRM</li> <li>• SQL Server Reporting Service (SSRS)</li> <li>• PowerPivot</li> </ul>	MON-Bus 1-4
<b>Information Technology Security &amp; Access</b>	<ul style="list-style-type: none"> <li>• Provided by the Cloud</li> </ul>	IT-SEC 1-11
<b>Information Technology Communications</b>	<ul style="list-style-type: none"> <li>• Microsoft Live Meeting</li> <li>• Cisco Unified Contact Center Enterprise (UCCE) – provided by VA</li> <li>• Bucher-Suttor Connector for Microsoft Dynamics CRM</li> <li>• WhosOn Live Chat Software for Microsoft Dynamics CRM from PARKER software</li> </ul>	IT-COMM 1-11
<b>Graphical User Interface (GUI)</b>	<ul style="list-style-type: none"> <li>• Microsoft Dynamics CRM</li> <li>• TK Process Builder</li> <li>• Telerik ASP.NET Controls</li> <li>• Microsoft Office</li> </ul>	GUI 1-22
<b>Interoperability/Interfaces</b>	<ul style="list-style-type: none"> <li>• Standardized and secured</li> </ul>	INT 1-10

PWS REQUIREMENTS	Proposed COTS Product	Appendix B Requirements
<p align="center"><b>System Criteria and Performance</b></p>	<p align="center">web service</p> <ul style="list-style-type: none"> <li>• Desktop virtualization solutions form Citrix</li> <li>• Microsoft Windows 8.0 Professional</li> <li>• Web browser (Internet Explorer and Firefox)</li> <li>• Microsoft Office Standard</li> <li>• Adobe Reader or Adobe Acrobat Professional</li> <li>• Foresee – provided by VA</li> <li>• Digital Analytics Program (DAP) – Provided by GSA</li> </ul>	<p align="center">PERF 1-21</p>

The VEMS production release will include the following features to satisfy/exceed all functionality identified in the PWS Section 5.6.1:

1. **Integrated CRM** – To unify staff communications throughout the verification process, including those communications between the Contact Center representatives and Veterans (or their designated proxies). This includes the domains of computer-telephony, email, and web-based applications. Using Microsoft Dynamics CRM, the VA Cisco VOIP system, and an Exchange Email Server into VEMS via web interfaces, the overall solution will improve customer communication, inter-team collaboration, and overall operational performance. This will allow OSDBU users to communicate easily and consistently with other staff and the applicants, better manage the verification process with rule-specific alerts and notifications, easily locate and view case information for follow-on inquires, and troubleshoot issues.
2. **Automated workflow and configurable business rules** – For processing and tracking applications through the verification process in alignment with those assigned to manage, review, and update work assignments, the VEMS solution leverages the Microsoft Dynamics CRM framework for workflow to provide automated workflow management that allows the configuration of business rules and modification of workflows. The VEMS CRM workflow engine supports both automated and manual steps to provide maximum flexibility for the verification process supporting tracking, searching and work assignments.
3. **Strong Data Integration** – Using the VA’s enterprise component Scribe Insight to integrate data across multiple databases, the solution will utilize secured web services to access VEMS data and documents with appropriate permissions for business logic, public sharing, digital strategy and integration with third-party web services or software components. Using Microsoft’s Dynamics CRM and SharePoint products, the solution leverages the enterprise email solution (Microsoft Outlook) to provide simplified access to customer data and supporting documents. In addition, our solution will integrate PowerSearch and AttachmentExtractor for Microsoft Dynamics CRM into VEMS. PowerSearch provides search over all CRM entities and filters to the search results. AttachmentExtractor can replicate or extract email attachments and notes to a SharePoint location or a file share to save CRM storage space. The extracted file is

saved on a SharePoint location - it can be indexed and therefore searched via the MS Search Server functionality.

**4. Automating critical correspondence such as verification letters with support for customization with e-signature options.** Two COTS components, AutoMerge for Microsoft Dynamics CRM and AlphaTrust Pronto, provide letter generation and e-Signature capabilities for non-repudiation of critical correspondence. Throughout the verification process, the VEMS solution will populate content with business and/or applicant information from submitted form data.

**5. Creating standardized reports and business process dashboards with ad hoc queries–** To monitor and report on overall case processing, call handling, and major milestones in the verification process, VEMS uses standardized, customized and reconfigured reports and dashboards from the Microsoft Dynamics CRM framework to track site usage, the overall verification process, and customer center operations. Reports and ad hoc queries are supported via SQL Server Reporting Service (SSRS).

**6. New/Revised Applicant Web Portal –** To provide a streamlined and informative user interface to replace the functionality in the current VIP/VCMS user interface while integrating important data capture capabilities, VEMS leverages best practices in usability and data integration to make the Application and Initiation processes more comprehensive. This includes providing a new public web portal for applicants in accordance with VA Handbook 6102 to replace the current VIP web portal ([www.vip.vetbiz.gov](http://www.vip.vetbiz.gov)).

The VEMS solution anticipates the following primary categories of end users:

- **Veterans and/or their designated proxies:** These users operate with the goals of profiling and submitting data about their histories and their businesses for consideration by the CVE verification team. These users include the roles of Veteran and Business Owner.
- **CVE Case Managers:** These end users operate with the goals of reviewing the solicited information for consideration and then enhancing the business profiles with data provided during the Review and Determination process. These end users include the roles of the Initiation, Examination, Evaluation, Determination, and Call Center Team(s) and their supervisors
- **CVE Power Users:** These end users operate with the goals of modifying COTS configurations to accommodate changes in current data processing rules. These users include the roles of System Administrators.

Further clarification of these end user profiles, including their descriptions, and goals, is provided in Table 1 of the VEMS To-Be Process Flows document (*VEMS Actors, Descriptions, and Goals*)

## 2.2. Overview of the Business Process

The full Verification process, along with other CVE processes such as Risk, Customer Service, and Quality Assurance processes, will be fully defined in the To-Be Process documentation.

However, this section defines the Verification Process and serve as a baseline for the major changes and enhancements that will be delivered in VEMS.

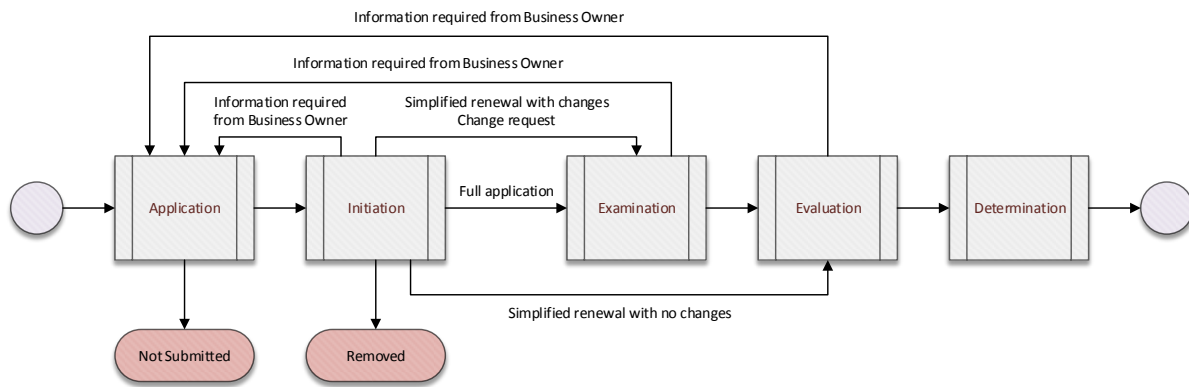
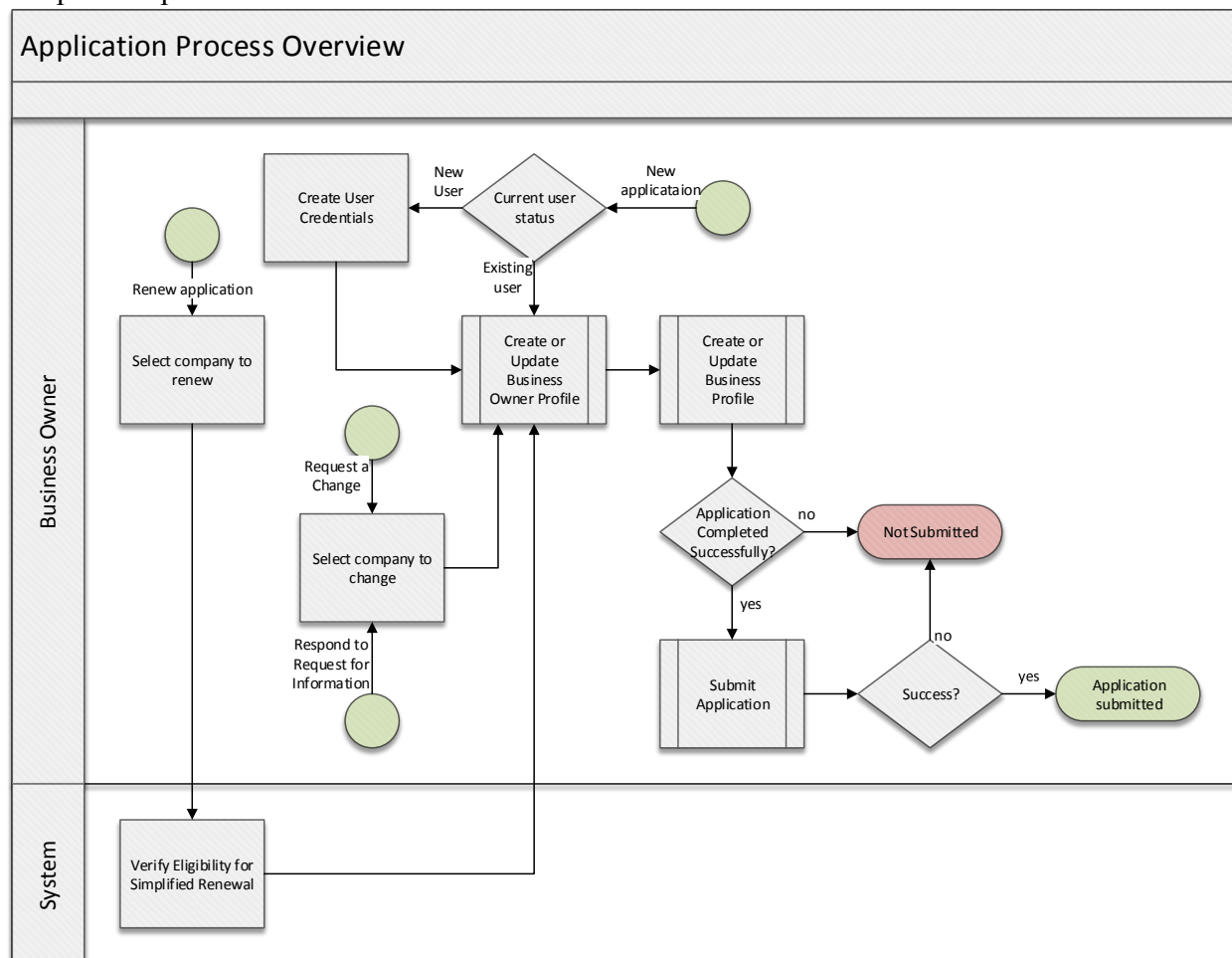


Figure 1: Verification Process Overview

### 2.2.1. Application Process

The Application Process covers all activities taken by the Business Owner to submit an application for eligibility in the program. In the To-Be process flow described below, the VEMS solution automates the acquisition and validation of information so that the application will be as complete as possible when submitted.





## **Figure 2: Application Process Overview**

VEMS will significantly enhance the Application process with the goal of providing a clean data application once submitted for verification. This will reduce the requests for documents and information that go back to the Veteran and will increase the chances of success for verification in a timely manner.

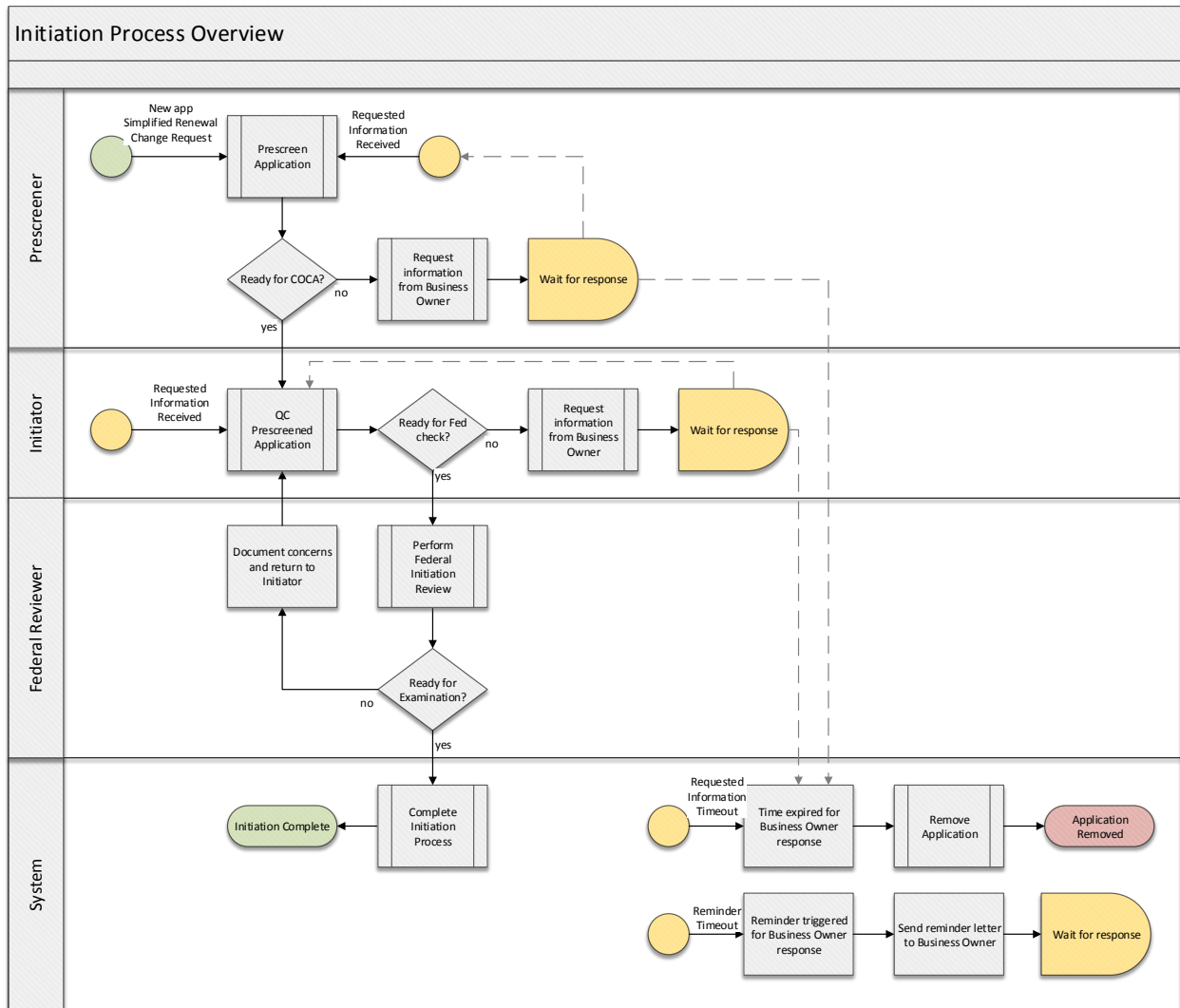
Improvements are anticipated in the following areas:

- ✓ Automated information retrieval from VA Systems of Record such as BIRLS, CORP, and DMDC for validation of service completion, character of service, and VA and/or DoD service disability
- ✓ Automated information retrieval from SAMS, Dun & Bradstreet, and/or the Small Business Administration to verify business existence and status (may not be present in early releases)
- ✓ Automated information retrieval from IRS to verify financial records (may not be present in early releases)
- ✓ Validation of required documents before submission is allowed
- ✓ Application will be electronically signed so that fewer paper forms must be exchanged
- ✓ Risks can be identified during the application process based on the information retrieved from the various data sources
- ✓ Problems identified with the Business Owner or the Business itself will be flagged and highlighted for CVE team members to focus on in the verification process

By requiring the Veteran to resolve data validation and omission issues with the submitted application earlier in the process, thereby reducing the probability of problems after the application is submitted.

### **2.2.2. Initiation Process**

The Initiation Process covers activities taken by the Initiation team to validate the information in the application. In the To-Be process flow described below, the VEMS solution automates and assists the validation of the application.



**Figure 3: Initiation Process Overview**

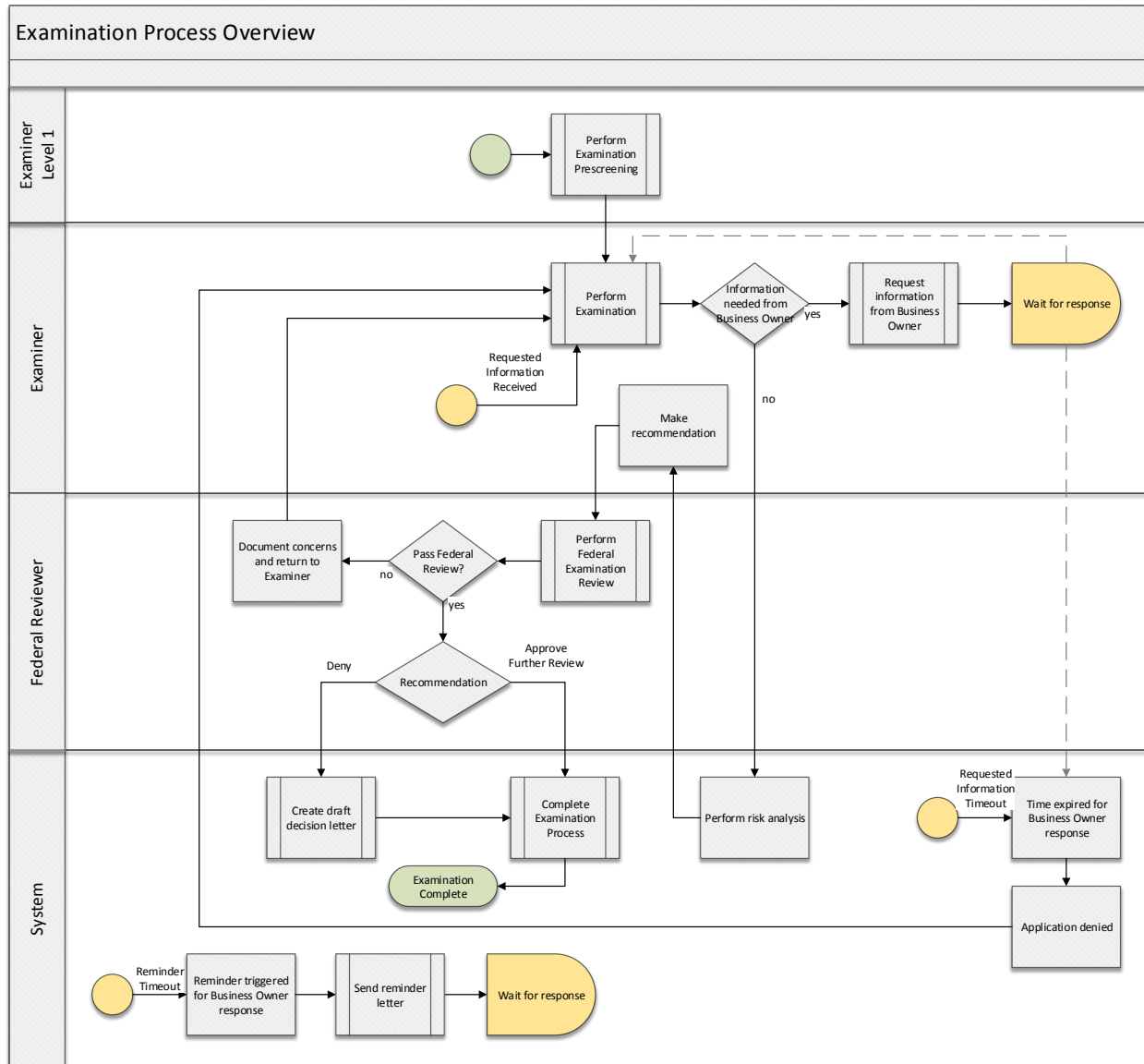
Improvements are anticipated in the following areas:

Assignments are automated through the CRM workflow engine, removing the manual assignments using spreadsheets

- ✓ Data validation is automated, removing manual logins to separate systems (some systems may not be automated in early releases)
- ✓ Automated letter generation and distribution
- ✓ Automated process time tracking and reminders, removing the manual tracking using spreadsheets
- ✓ Reports are automated, removing manual reporting using spreadsheets
- ✓ GCC contractors will use the same system as other CVE team members, removing cut and paste and other manual data transfers

### 2.2.3. Examination Process

The Examination Process covers activities taken by the Examination Team to validate the information in the application and provide an initial recommendation. In the To-Be process flow described below, the VEMS solution automates and assists the validation of the application.



**Figure 4: Examination Process Overview**

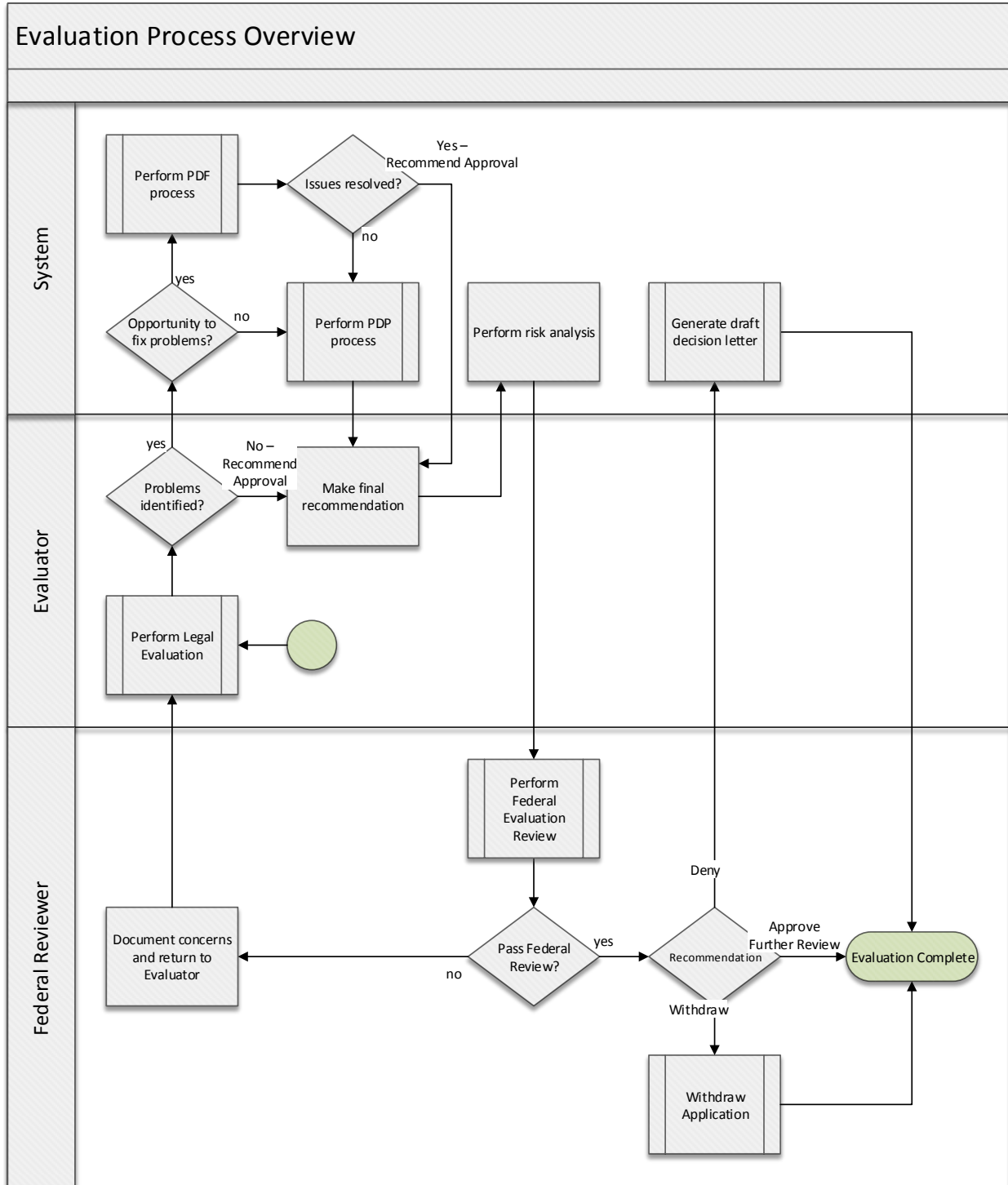
Improvements are anticipated in the following areas:

- ✓ Assignments are automated through the CRM workflow engine, removing the manual assignments using spreadsheets
- ✓ Data validation is automated, removing manual logins to separate systems (some systems may not be automated in early releases)
- ✓ Automated process time tracking and reminders, removing the manual tracking using spreadsheets
- ✓ Reports are automated, removing manual reporting using spreadsheets

- ✓ GCC contractors will use the same system as other CVE team members, removing cut and paste and other manual data transfers

### 2.2.4. Evaluation Process

The Evaluation Process covers activities taken by the Evaluation Team to perform a legal review of the application and provide a final recommendation. In the To-Be process flow described below, the VEMS solution automates and assists the legal review of the application.



## **Figure 5: Evaluation Process Overview**

Improvements are anticipated in the following areas:

- ✓ Assignments are automated through the CRM workflow engine, removing the manual assignments using spreadsheets
- ✓ Data validation is automated, removing manual logins to separate systems (some systems may not be automated in early releases)
- ✓ Automated letter generation and distribution
- ✓ Automated process time tracking and reminders, removing the manual tracking using spreadsheets
- ✓ Reports are automated, removing manual reporting using spreadsheets
- ✓ GCC contractors will use the same system as other CVE team members, removing cut and paste and other manual data transfers

### **2.2.5. Determination Process**

The determination process is responsible for finalizing letters to the Veteran and obtaining executive signatures for those letters.

Improvements are anticipated in the following areas:

- ✓ Assignments are automated through the CRM workflow engine, removing the manual assignments using spreadsheets
- ✓ Automated letter generation and distribution
- ✓ Automated process time tracking and reminders, removing the manual tracking using spreadsheets
- ✓ Reports are automated, removing manual reporting using spreadsheets

### **2.2.6. Risk Process**

The risk process is responsible for investigating fraud tips and hot line referrals, responding to OIG document requests, and managing site visits.

Improvements are anticipated in the following areas:

- ✓ Integrate fraud protection processes into VEMS system
- ✓ Assignments are automated through the CRM workflow engine, removing the manual assignments using spreadsheets
- ✓ Data validation is automated, removing manual logins to separate systems (some systems may not be automated in early releases)
- ✓ Automatically acquire updated company information prior to starting investigations
- ✓ Automated letter generation and distribution
- ✓ Automated process time tracking and reminders, removing the manual tracking using spreadsheets
- ✓ Reports are automated, removing manual reporting using spreadsheets

## **2.3. Business Benefits**

The business benefits have been highlighted the description of the processes in Section 2.2.

## **2.4. Assumptions, and Constraints**

This document assumes the following:

- The provider of hosting services in the cloud will support a SLA that aligns with the policies of the VA and the performance metrics required by the OSDBU business unit.
- The COTS software will be accepted and secured to achieve an Authority To Operate (ATO)
- Call Center technology in the customer's call center can be easily integrated into the standards-based integration points for the solution. The VA security team will approve the integration of end-user identity information required by hosting the solution and the cloud.
- The solution will comply with the VA-One TRM.
- The solution will receive an approval from the VA's System Engineering Design Review (SEDR).
- The customer and the VA's enterprise architecture teams will collaborate with the project implementation team to minimize impediments with the design, development, and deployment of the solution.

## **2.5. Overview of the Significant Requirements**

This section will be updated upon further refinement of the functional and technical requirements.

### **2.5.1. Overview of Significant Functional Requirements**

This section will be updated upon further refinement of the functional and technical requirements.

### **2.5.2. Functional Workload and Functional Performance Requirements**

This section will be updated upon further refinement of the functional and technical requirements.

### **2.5.3. Operational Requirements**

This section will be updated upon further refinement of the requirements.

## **2.5.4. Overview of the Technical Requirements**

This section will be updated upon further refinement of the functional and technical requirements.

## **2.5.5. Overview of the Security or Privacy Requirements**

This information will be provided upon finalization of the requirements refinement process.

## **2.5.6. System Criticality and High Availability Requirements**

This information will be provided in subsequent releases.

## **2.5.7. Special Device Requirements**

This is currently non-applicable to VEMS.

## **2.6. Legacy System Retirement**

The design of the proposed VEMS system allows for parallel operation of the legacy system until such time that the OSDBU group confirms that the legacy system can be retired. Integration of existing VCMS data into the VEMS system will be accomplished by loading extracts of legacy data that has been mapped to match its corresponding logical entities in the new system. The project development team will leverage COTS software tools and the data integration methods available from the Microsoft CRM platform wherever possible to minimize the associated costs of extensive data integration and data cleansing efforts that will significantly reduce their workloads as a result of the design and deployment of this system.

### **2.6.1. Transition Engineering**

The transition from the legacy system to the new VEMS architecture will be defined in the project's Transition documentation. Transition planning will define the enhancements necessary to the As-Is model of the system to support the functionality defined in the new VEMS system. This alignment will come from the process flow analysis, the definition of data/content standards, the development of ETL capabilities, and the utilization of COTS tools for data ETL and content loading (documents/attachments). Through the use of SharePoint metadata tagging, batch document loading, batch account creation, and other COTS mechanisms, we can ensure parallel operations. This will be vital for parallel system testing to ensure data quality, process flow conformance, and user acceptance.

### **2.6.2. Transition Architecture**

Both Dynamics and SharePoint have the ability to batch load excel documents, PDFs, word documents, and other artifacts. This loading will be performed in batch and then incrementally as required to align with the transition plan. Documents loaded will be metadata tagged and validated to ensure no duplication and zero content loss.

For SQL Server direct data integration, the solution will use SSIS, SSAS, SSRS to validate the state of batch-loaded data and ensure conformance with data integrity, data quality, and data security requirements.

### **2.6.3. Data Integrity and Cutover Planning**

Parallel planning as documented in the transition deliverable(s) will focus on ETL, content loading, automated parallel processing (to avoid redundant user activities unnecessarily), and data quality testing. Test planning will be vital to prove that the enhanced data and content processes meet all requirements, transition all legacy data, ensure zero data loss, and guarantee 100% data quality. Until these criteria are met and final user acceptance is achieved, parallel processing will be supported to guarantee provision of capabilities to users during this period.

**Table 9 Proposed Legacy Retirements**

<b>Legacy System or Legacy System Component</b>	<b>Retired or Workload Reduced</b>	<b>If Workload Reduced – How Much</b>
VCMS	Retired	

### **3. Conceptual Design**

This section of this document provides details about the following topics:

- Conceptual Application Design
- Conceptual Data Design
- Conceptual Infrastructure Design.

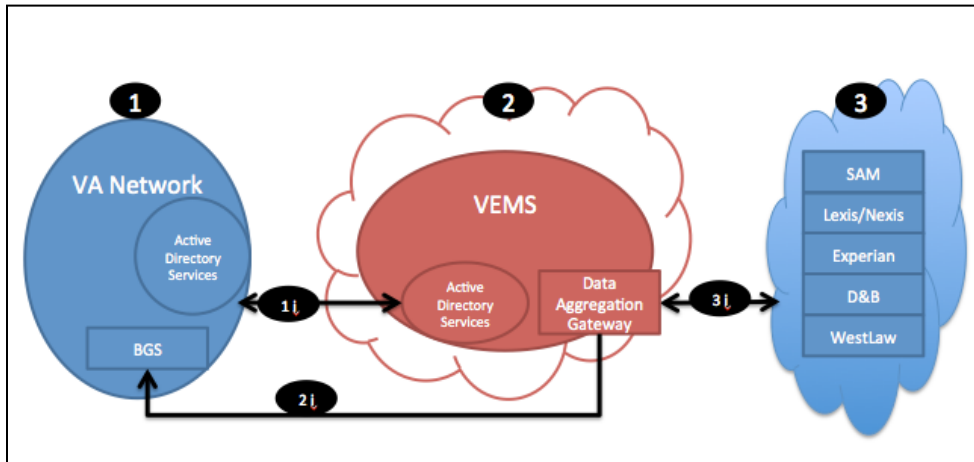
#### **3.1. Conceptual Application Design**

Conceptual application design offers an overview of core functional components in the VEMS ecosystem without itemizing specific design characteristics or physical architecture. This is focused on logical design and what components and subcomponents of logical functionality are required to meet all VEMS requirements and gain user acceptance.

##### **3.1.1. Application Context**

The following figure represents a high-level context in which the solution will exist that is commensurate with the Conceptual Design required by ProPath.





**Figure 6: Application Context Diagram for the VEMS Solution**

The following table provides details for this diagram.

**Table 7: VEMS Application Context Diagram**

ID	Name	Description	Interface Name	Interface System
1	VA Network	The secured VA network and collection of servers, services, and identity management accounts.	<ul style="list-style-type: none"> <li>Active Directory Synchronization Services,</li> <li>Secured Web services</li> </ul>	VEMS Cloud Solution
2	VEMS Cloud Solution	The secured VEMS solution hosted by a FedRAMP-certified cloud provider.	<ul style="list-style-type: none"> <li>Secured Web Services</li> <li>Active Directory Synchronization Services</li> </ul>	VA Network
3	Public Internet	The unsecured public internet	<ul style="list-style-type: none"> <li>Secured Web services</li> </ul>	VEMS Cloud Solution

**Table 8. Interfaces External to OIT**

ID	Name	Related Object	Input Messages	Output Messages	External Party
1	Active Directory Federated Services	VA Network	Active Directory Synchronization Messages	Active Directory Synchronization Messages	VEMS Cloud Solution
2	Secured Web Services	VA Network	Secured XML-based data queries	Secured XML-based data result sets	VEMS Cloud Solution
3	Secured Web Services	VEMS Cloud Solution	Secured XML-based data queries	Secured XML-based data queries	<ul style="list-style-type: none"> <li>• Public Internet SAM</li> <li>• Lexis/Nexis</li> <li>• Experian</li> <li>• D&amp;B</li> <li>• WestLaw Legal</li> </ul>

### 3.1.2. High Level Application Design

This High-Level Application Design identifies the major components of the VEMS solution and the relationships of the major application components to each other and to the surrounding applications. The major components of the application are at the subsystem or top-level service area. Lower-level services will be defined and documented in the Logical Application Design. Core architecture tenets include:

- **Utilization of COTS for CRM and Content Management**-VEMS is being built on top of the COTS capabilities of CRM and SharePoint content management. These functions will be maximized as COTS functions to ensure maximum benefit from the defined architecture and for VA investment. This aligns with the design principles of other VA enterprise initiatives such as VRM and FCMT
- **Loose coupling across components**-for all COTS and custom components, the principles of loose coupling will be utilized to maximize the possibility of further enhancements. To meet this design direction, VEMS will maximize the use of standard-based interactions and limit the use of proprietary data interchange
- **SOA**-VEMS is being built to enterprise SOA standards and will act as both a service consumer and provider
  - **Service consumer**-Where possible, VEMS will utilize existing VA service initiatives such as BGS and MVI to consume relevant data and to ensure properly governed service utilization and minimal development and sustainment costs are incurred. An analysis of VLER services for possible reuse will be performed during further elaboration of the requirements.
  - **Service provider**-where functions must be developed to support VEMS requirements, VEMS will publish and act as a service provider for these functions.

#### 3.1.2.1. Security Architecture Overview

VEMS will utilize unified identity management and will leverage MVI services for user identity, Veteran identity; the following example highlights basic MVI integration patterns.

These are the primary methods used to integrate with MVI:

- 1) To do an initial search (correlation) for a veteran/person between VEMS and existing authoritative systems.
- 2) To retrieve current ID's for integration purposes, and display current data for a veteran/person from the existing authoritative systems.

#### **GetCorrespondingIDs (Patient Registry Get Identifiers Query - 1309/1310)**

**GetCorrespondingIDs** is an operation of the MVI Service, used to retrieve all known MVI Identifiers as they relate to a source identifier. The transaction grouping for this interaction is a 1309 Request and 1310 Response.

#### **Search Person (Patient Registry Find Candidates Query – 1305/1306)**

**Search Person** is an operation of the MVI service, used to retrieve all known MVI Identifiers as they relate to a source identifier. The transaction grouping for this interaction is a 1305 Request and 1306 Response.

There are 2 different types of 1305 Request that can be submitted for this operation:

- **Match criteria in queryByParameter**, with person trait data to be searched for in parameterList.
- **Correlation identifier in parameterList** – either ICN or IEN (one or the other, but not both). No person trait data is supplied for this type of request.

These two types of requests differ in format and content of the queryByParameter element, as described below. Both request types return a 1306 Response.

There is also another option to a *1305 Search Person* request. This 1305 Search Person request will return the results from a call to 1309 GetCorrespondingIDs if the person is found. This option eliminates the need to make a separate call to GetCorrespondingIDs later in a session. The 1305 Search Person call with the GetCorrespondingIDs results is referred to in this document as a 1305 Search Person Composite call. This call can only be made as an unattended search.

### **3.1.2.2. Auditing in CRM**

Microsoft Dynamics CRM provides an auditing capability where entity and attribute data changes within an organization can be recorded over time for use in analysis and reporting purposes. Auditing is supported on all custom and most customizable entities and attributes. Auditing is not supported on metadata changes, retrieve operations, export operations, or during authentication.

The following list identifies the supported auditing features for Microsoft Dynamics CRM:

- Audit of customizable entities
- Audit of custom entities
- Configure entities for audit
- Configure attributes for audit
- Area wise auditing
- Privilege based audit trail viewing
- Privilege based audit summary viewing
- Audit log deletion for a partitioned SQL database
- Audit log deletion for a non-partitioned SQL database
- Microsoft Dynamics CRM SDK programming support
- Audit of record create, update, and delete operations
- Audit of relationships (1:N, N:N)
- Audit of audit events
- Audit of user access
- Adherence to regulatory standards

The following list identifies the data and operations that can be audited:

- Create, update, and delete operations on records
- Changes to the shared privileges of a record
- N:N association or disassociation of records
- Changes to security roles
- Audit changes at the entity, attribute, and organization level. For example, enabling audit on an entity.
- Deletion of audit logs
- When (date/time) a user accesses Microsoft Dynamics CRM data, for how long, and from what client

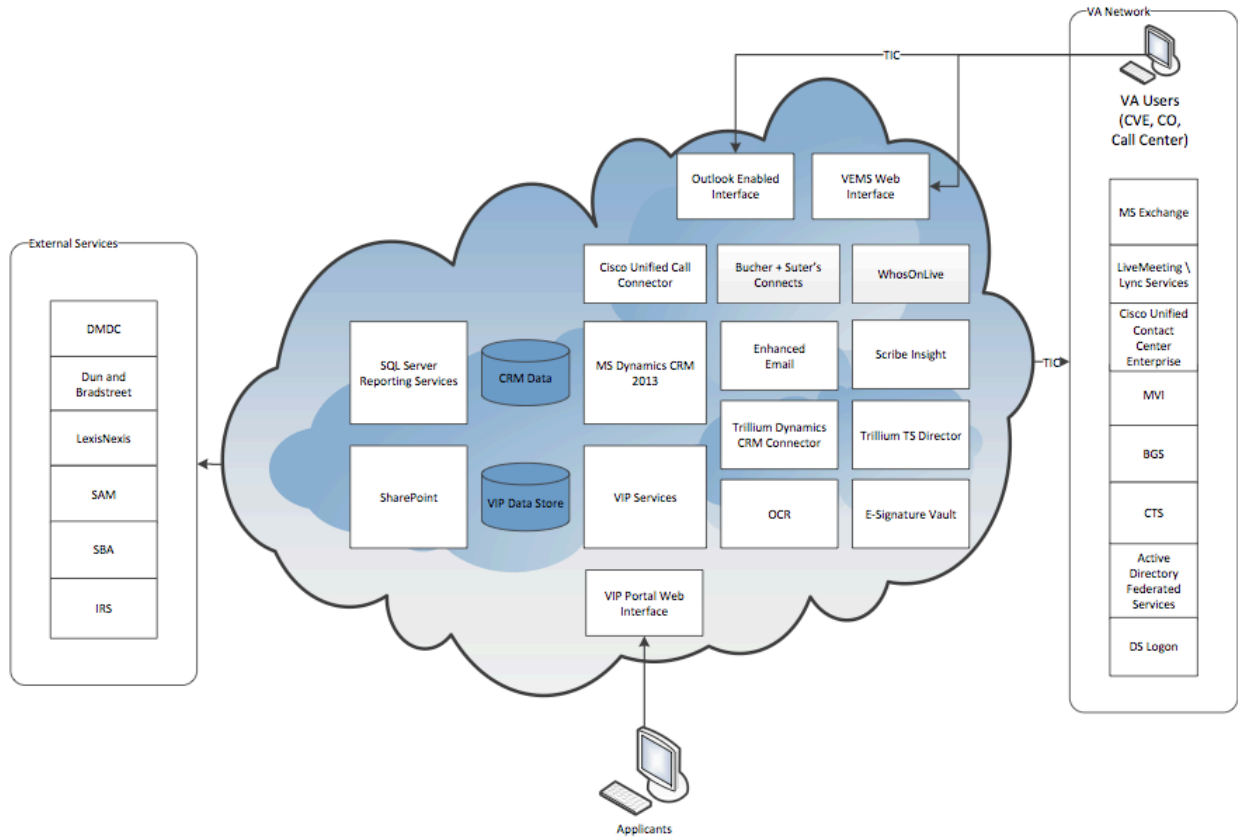
### **3.1.2.3. Desktop Virtualization**

VEMS will utilize desktop virtualization (Citrix XenApp) to provide unified desktop capabilities for case management functions. In order to unify and secure all of the components including Outlook, Lync/LiveMeeting, call center, etc. into a seamless desktop in a cloud hosted environment, the desktop will be published to ensure a unified experience for the users with fully controlled access.

This functionality will minimize the opportunities for data leakage and will provide a consistent user interface for creating and editing Microsoft Office documents. These documents will be stored on virtualized network drives and/or in the VEMS document management repository (SharePoint).

### **3.1.2.4. VEMS Application Architecture Diagrams**

The following diagrams and component/interface summaries show the components and subcomponents that comprise the VEMS solution.



**Figure 7: Application Context Diagram for the VEMS Solution**

The following table provides details about the entities and interfaces presented in this diagram.

**Table 9: Objects in the High Level Application Design**

Name	Description	External Interface Name	External Interface ID	Internal Interface Name
<b>Active Directory Federation Services</b>	Synchronizes secured identity management systems	AF DS	VA AD FS Services	Active Directory Federated Services
<b>MVI</b>	Lookup identity and corresponding system IDs	MVI	MVI	MVI
<b>Outlook plugin or web interface</b>	Presents data to the end user compliant with the devices/systems requesting data	Presentation-Centric Secured Web Services	None	Presentation Services
<b>Security Services</b>	Authorizes and Authenticates	Security-centric Web Services	None	<ul style="list-style-type: none"> <li>Active Directory Federated Services</li> </ul>

	requests for data to end users and external systems			<ul style="list-style-type: none"> <li>Data Aggregation Services</li> </ul>
<b>MS Office Suite</b>	The Microsoft Office Productivity Suite, including Outlook, Word, Excel, and PowerPoint		None	<ul style="list-style-type: none"> <li>Active Directory Federated Services</li> <li>Presentation Services,</li> <li>Analytical Services</li> <li>Persistent Storage Services (Email, Document Management, and SQL)</li> </ul>
<b>MS Dynamics CRM Services</b>	The Microsoft Dynamics CRM application and services	None	None	CRM Services
<b>MS SharePoint</b>	SharePoint content management and document storage	N/A	N/A	SharePoint Services
<b>CRM Plug-ins</b>	Functionality-specific software components to the Dynamics application	None	None	<ul style="list-style-type: none"> <li>PowerSearch</li> <li>eSignature</li> </ul>
<b>Analytical Services</b>	Software components to deliver business intelligence functionality on CRM-related data and process metrics	None	None	CRM Analytical Services
<b>Email Routing Services</b>	Software components to integrate email to the CRM services	None	None	Microsoft Email Router for Dynamics CRM
<b>Data Aggregation Services</b>	Secured data services to retrieve VEMS-specific data for integration in to the verification process and the VEMS	VEMS Data Aggregation Services	VEMS Data Aggregation Services	<ul style="list-style-type: none"> <li>SAM Web Services</li> <li>Lexis/Nexis Web Services</li> <li>Experian Web Services</li> <li>Dun &amp; Bradstreet (D&amp;B) Web</li> </ul>

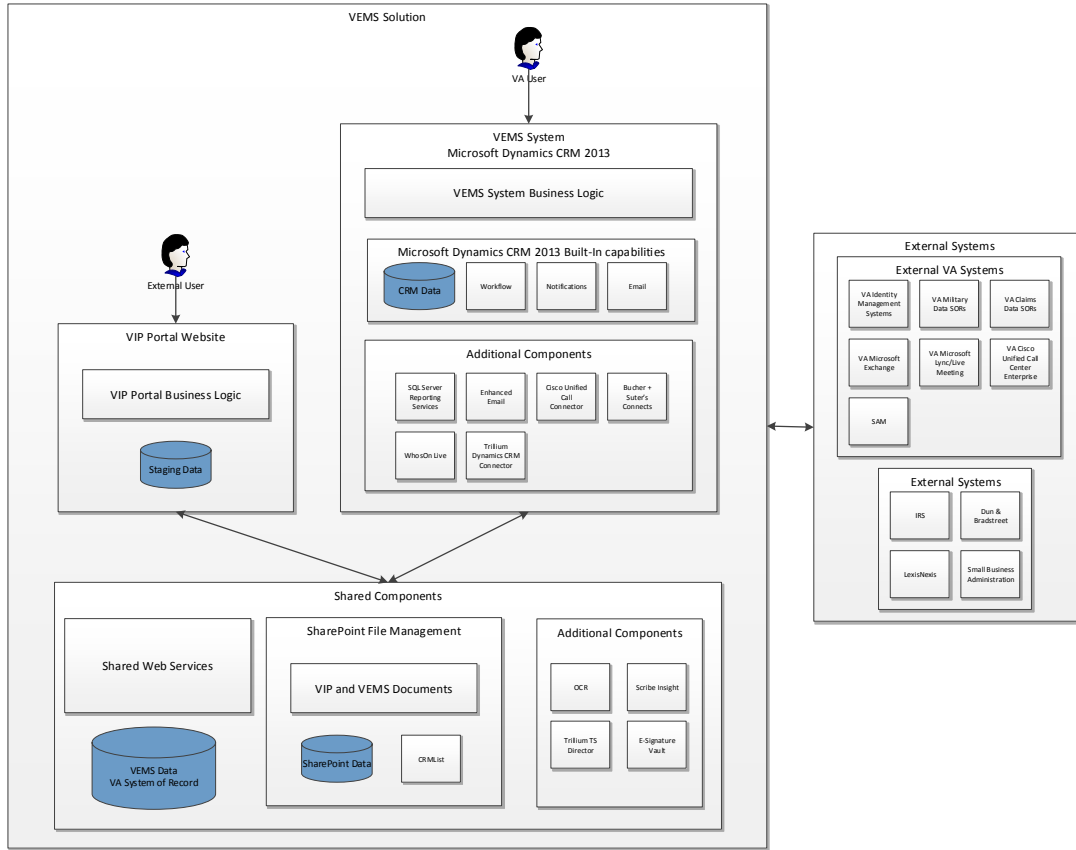
	databases			Services <ul style="list-style-type: none"> <li>• WestLaw Legal Web Services</li> </ul>
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**Table 10: Internal Data Components**

ID	Name	Data Stored	Steward	Access
1	Email Storage	Email and email attachments	VEMS Cloud Provider	Create, Retrieve, Update, Delete
2	Document Storage	Digital Documents	VEMS Cloud Provider	Create, Retrieve, Update, Delete
3	Structured Data	<ul style="list-style-type: none"> <li>• Structured data and related metadata</li> <li>• Process metrics</li> <li>• Workflow rules</li> </ul>	VEMS Cloud Provider	Create, Retrieve, Update, Delete

The following diagram demonstrates the subcomponent architecture that creates the VEMS ecosystem and identifies major interaction points and interfaces.





**Figure 8: VEMS Component Architecture**

Major data interactions include but are not limited to:

**Table 11: Major Data Interactions and Payloads**

<b>System A</b>	<b>System B</b>	<b>Interaction/Payload Content</b>
<b>VIP Portal Website</b>	VIP Application Services	HTML5
<b>VIP Application Services</b>	VIP Database	Staging and cache data
<b>VIP Application Services</b>	External Validation Services	SOAP/REST Services
<b>Published Desktop (Citrix)</b>	User	VDI
<b>VIP Application Services</b>	SharePoint	Content Management (docs, attachments)
<b>VIP Application Services</b>	OCR	Content Management (docs, attachments)
<b>TS Quality</b>	Dynamics CRM	Content Management (docs, attachments) with OCR content and metadata
<b>Dynamics Application Server</b>	AutoMerge for Dynamics	CRM entities, MS Word documents
<b>Dynamics Application Server</b>	B-S Connects for Dynamics	VOIP data
<b>Dynamics Application Server</b>	Exchange	Mail integration
<b>Dynamics Application Server</b>	LiveMeeting/Lync	Instant Messaging Integration
<b>VEMS Components</b>	ADFS	Authentication and Authorization Services
<b>Dynamics Application Server</b>	SharePoint	Content Management

### 3.1.3. Application Locations

The VEMS hosting solution will be based on a Cloud Computing Model as defined in National Institute of Standards and Technology (NIST) Special Publication 800 145 – “The NIST Definition of Cloud Computing.” The VEMS application will be hosted in a cloud location that meets a FISMA Security Categorization of Moderate. The datacenter(s) hosting the VEMS servers will meet the VA Information Assurance (IA) requirements and obtain a FedRAMP Provisional ATO to ensure FISMA Moderate security controls are implemented and certified by a FedRAMP-approved Third Party Assessment Organization (3PAO).

The VEMS application cloud solution will utilize both Infrastructure as a Service (IAAS) and/or Platform as a Service (PaaS) hosting services from the cloud provider in order to minimize costs to sustain computing, network, storage, server, and operating system hardware/software components. Each separate VEMS application environment – Development, Preproduction, and Production – will be managed in the cloud to maintain consistent deployment, operations, maintenance, and upgrades throughout the application lifecycle. VEMS will use these benefits to utilize network access from a heterogeneous mix of thin or thick client platforms (mobile phones, tablets, laptops, and workstations) and access cloud services measured by resource usage such as bandwidth, processing, storage, and number of active user accounts.

The VEMS cloud architecture will incorporate a hybrid deployment model that includes both public cloud services to SDVOSB as well as private cloud capability for VA internal administration, and external VA partners. The hybrid structure allows for separate private cloud network transmissions between the cloud provider and VA community networks that adhere to signed interconnection security agreements ensuring secure transmission and information system access controls are strictly enforced. For example, the VA call center VoIP network will have an interface to VEMS web services for interacting with the user community and have its own interconnect security agreement with the VEMS system.

The cloud location hosting provider must sign SLAs to ensure that VEMS data remains secure and available while adhering to all VA data protection regulations. Cloud provider security mechanisms will be enforceable to protect VEMS personally identification information (PII) transactions through FIPS 140-2 approved data encryption in transit, in use, and at rest. The cloud services model itself is designed to have inherent availability mechanisms through systems virtualization, redundant backup systems, and disaster recovery processes that are each independently verified and validated during the FedRAMP ATO accreditation process.

The cloud service cost model characteristics appeal to the need to balance the application usage costs over time using a ‘pay on demand’ approach versus spending a large amount of initial funds on hardware, software and staff to manage data center services. Moreover, using a cloud services model will enable the VA to allocate common IT costs per VEMS system usage across internal VA office units, VEMS Government agency partners, and VEMS commercial partners. This usage model provides flexible options for more predictable budgeting activities in future years of operation. In addition, the VEMS information system will inherit a large number of security control protections from the cloud services FedRAMP certification that will reduce the costs of the compliance-related authorization for VEMS and IA sustainment.

At the time of this draft an application location had not yet been selected.

**Table 12 Application Locations**

Application Component	Description	Location at Which Component is Run	Type
[Component Name]	[Description]	[Facility name]	[Presentation Logic / Business Logic / Data Logic / Interface Code]

### 3.1.4. Application Users

Many users will have access to the VEMS system to participate in the verification process. The users are listed below along with a brief description and an indication of if they are internal to the VA or external. Each type of user will access each component of the system with the exception of the users that are external to the VA. These users will not access the Microsoft Dynamics CRM components.

**Table 12: Application Users**

User	Description	VA Internal or External
<b>Veteran</b>	As the owner of the business entity requiring verification, the Veteran is the initiator of the verification process and responsible for ensuring that the CVE team has sufficient and verifiable information to process a verification application successfully.	External
<b>Enrollment Counselor</b>	An individual from a preselected and trained group of subject matter experts who assist Veterans with the information requirements and education about the verification process.	External
<b>Business Owner</b>	A senior stakeholder in a business; for the verification process often ‘the Veteran’ or a designated proxy. Also, someone who is interested in the verification process and seeks more information prior to submitting an application for verification. The Business Owner is used as the primary Actor in this document because not all applicants are Veterans and this usage allows us to refer to one actor without condition.	External
<b>Initiator</b>	A CVE team member who is responsible for collecting and verifying the Veteran’s application prior to review by CVE team members. Initiators want to minimize data errors or omissions during the application process that will affect the team’s ability to determine a business’s applicability for a successful CVE determination.	Internal
<b>Pre Screener</b>	A CVE team member who is responsible for the first look at the Veteran’s application when it is submitted.	
<b>Initiation Supervisor</b>	A CVE team member who is responsible for a staff of Initiators and Pre Screeners. This actor’s goal is to oversee the process of verifying the Veteran’s application.	

<b>Examiner Level 1</b>	A CVE team member who is responsible for an initial review of an applicant's documentation.	
<b>Examiner</b>	A CVE team member who is responsible for preparing the applicant's documentation and performing an initial risk assessment prior to review by the CVE team members.	Internal
<b>Examination Supervisor</b>	A CVE team member who is responsible for a staff of Examiners. This actor's goal is to oversee the process of accepting and verifying application and performing preliminary guidance on the applicant's data.	Internal
<b>Evaluator</b>	A CVE team member who is responsible for reviewing the applicant's business regarding legal, policy, and relevant risk parameters. The goal of this actor is to prepare the legal argument for the recommended disposition.	Internal
<b>Evaluation Supervisor</b>	A CVE team member who is responsible for a staff of Evaluators. This actor's goal is to oversee the process of reviewing the applicant's business regarding legal, policy, and relevant risk parameters.	Internal
<b>Site Visitor</b>	A CVE team member responsible for visiting the business on-site to research compliance with VOSB and SDVOSB regulations.	Internal
<b>Site Visit Coordinator</b>	A CVE team member who is responsible for a staff of Site Visitors and for coordinating the schedule of on-site visits.	Internal
<b>Federal Reviewer</b>	A government-employed CVE team member acting as a reviewer who reviews the recommendations and predetermination activities of a contracted employee on the CVE team. The goal of this actor is to provide government oversight and extra verification of eligibility work performed by a team member who is not a federal employee.	Internal
<b>Risk Manager</b>	A CVE team member who is responsible for evaluating and mitigating risk in the companies applying for certification.	Internal
<b>Risk Management Supervisor</b>	A CVE team member who is responsible for a staff of Risk Managers. This actor's goal is to oversee the process of evaluating and mitigating risk in companies applying for certification.	Internal
<b>Customer Support Representative</b>	A CVE team member who engages with the applicant (or their designated proxy) to answer questions about the data, the verification process, and the technical aspects of the data submission process.	Internal
<b>Customer Support Supervisor</b>	A CVE team member who is responsible for a staff of Customer Support Representatives. This actor's goal is to oversee the process of engaging with the applicants to answer questions and provide support.	Internal
<b>Quality Assurance Staff Member</b>	A CVE team member who is responsible for ensuring the quality of the processes and procedures of the CVE organization.	Internal

<b>Auditor</b>	A CVE team member who is responsible for auditing the CVE teams to ensure they are complying with their documented processes and procedures.	Internal
<b>Quality Assurance Supervisor</b>	A CVE team member who is responsible for a staff of Quality Assurance Staff Members and Auditors. This actor's goal is to oversee the process of ensuring the quality of the processes and procedures of the CVE organization and that CVE teams are complying with their documented processes and procedures.	Internal
<b>CVE Deputy Director</b>	A CVE team manager who is responsible for the policies, procedures, and operations of various CVE teams.	Internal
<b>CVE Director</b>	A CVE team executive who can provide direction and executive signature to verification process determinations.	Internal
<b>CVE Executive Director</b>	A CVE team executive who can provide direction and executive signature to verification process determinations.	Internal
<b>Office of General Council Staff</b>	A member of the Office of General Counsel organization who represents the VA in legal matters.	Internal
<b>VA Contracting Officer</b>	A VA employee tasked with collecting data from and evaluating prospective business owners to satisfy a business need. The VA Contracting Officer offers solicitations to business owners (or their designated representatives) for proposals to solve business needs for the VA.	Internal

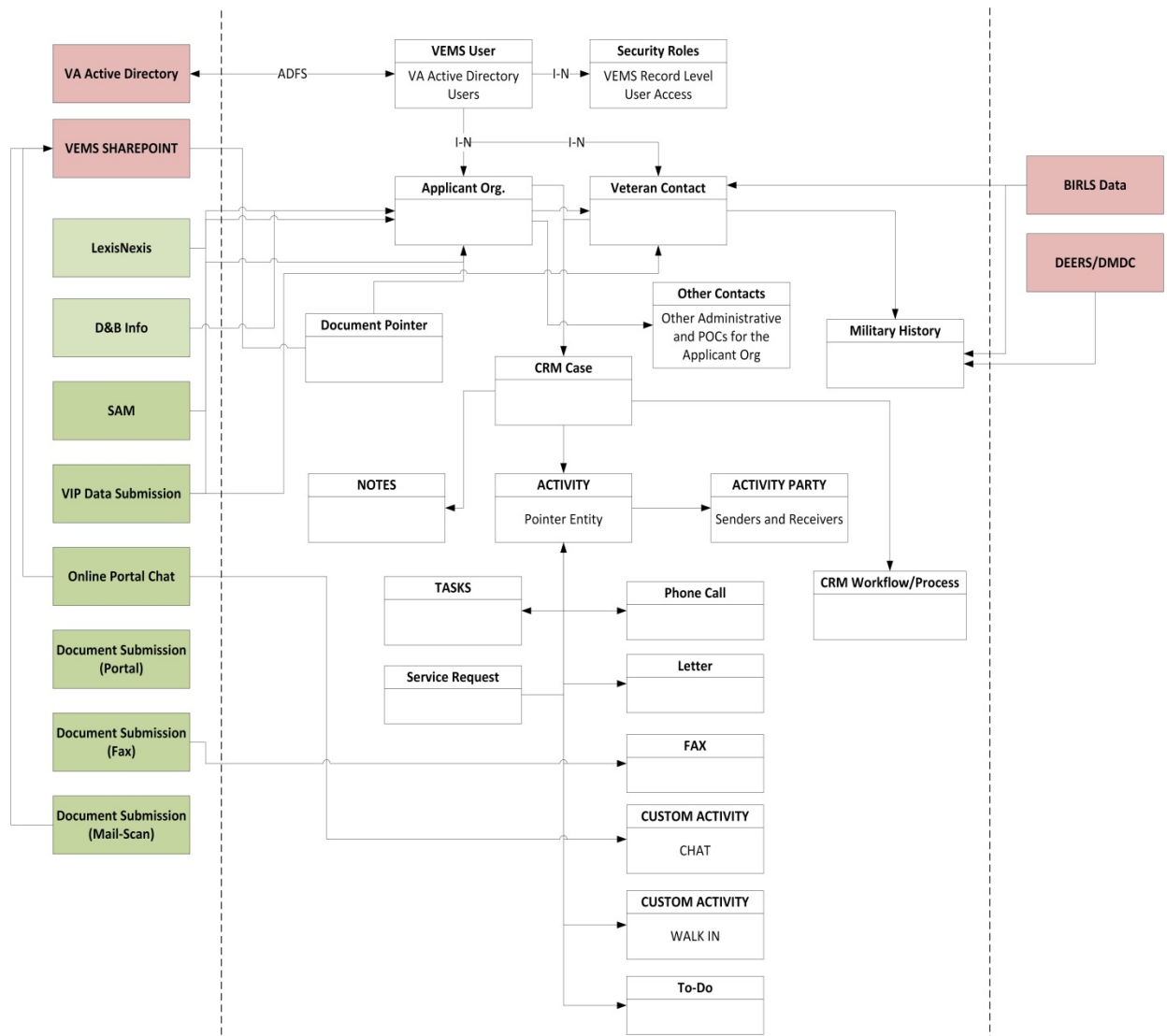
## 3.2. Conceptual Data Design

### 3.2.1. Project Conceptual Data Model

The project's conceptual data model (CDM) acts as a high-level representation of the data entities and their relationships. As per ProPath's instructions, it does not normally include the data elements that comprise each entity, but rather is a first step toward developing the more detailed logical data model that will be provided during the Logical Data Design.

VEMS will utilize CRM COTS internal storage for entities related to case management and their relationships. Items such as a Veteran (Account), case interactions (email or phone call), documents, etc. will be stored in CRM and its associated SharePoint interface. Some related information such as eligibility will come from external systems of record and not be persisted unless necessary, and then only cached. For external storage VEMS will utilize a database specifically designed for items not contained in the COTS components.

The following figure illustrates the major entities and their relationships as understood currently. This canonical model will be extended throughout the design phase



**Figure 9: Project Conceptual Data Model**

### 3.2.2. Database Information

The following databases (DB) will be created/replaced are part of the VEMS solution: The DB schemas for these databases are provided in the VEMS DB schema document.

**Table 14 Database Inventory**

Database Name	Description	Type	Steward
VIP	Database that stores all profiles for applicants, businesses, and other users of the VIP portal.	Replace	CVE\OSDBU
VEMS CRM	Database that stores all case related information regarding the processing of applications for the verification process. Also	Create	CVE\OSDBU

	maintains the case management for help desk support.		
VEMS Document Management Database	Database used to provide the back-end storage for the VEMS document management system	Create	CVE\OSDBU
VIP (VCMS)	Existing legacy system database, data will be extracted and transferred to the VEMS databases accordingly	Interface	CVE\OSDBU

### 3.3. Conceptual Infrastructure Design

The Conceptual Infrastructure Design for the VEMS application will be supported by cloud services technologies to securely host development, preproduction, and production environments. To preface, VEMS will be hosted in a FedRAMP approved cloud services provider location and the application itself will be portable in that its security boundary will not be dependent on its underlying infrastructure. As such, it is important that infrastructure design technologies implemented by the VEMS cloud host provider integrate One-VA TRM approved COTS products that are reliable and able to meet FISMA Moderate security controls to maintain a FedRAMP ATO and VA IA requirements.

The cloud services infrastructure supporting VEMS will incorporate the following design components: web servers, application servers, database servers, virtual machines, directory servers, network communication devices, network security devices, and network storage devices. Both the Test and Production environments will include core system elements listed below to support the VEMS application:

- Microsoft Windows Operating System platform
- Microsoft .NET Framework
- Microsoft IIS Web Server
- Microsoft SQL Server
- Microsoft Active Directory Server
- VMware VSphere ESXi

The VEMS conceptual infrastructure design will also include integration points to attach with the following systems:

- VA Telephony
- VA Virtual Desktop terminals
- VA Windows Exchange Mail Service
- VA Benefits Gateway Services
- VA Correspondence Tracking System
- GSA System for Award Management
- LexisNexis
- Dun & Bradstreet



- Westlaw
- Experian

The following table provides notional locations for the major components of the solution:

**Table 13: Technology Requirements**

Special Technology	Description	Notional Location	TRM Status
<b>Microsoft Windows 2008 R2 Server Operating System</b>	Supports web, database, directory, and application platform hosting environments	Cloud Service Provider (CSP) Platform As A Service (PAAS)	Yes
<b>Microsoft SQL Server</b>	Database Management Server	CSP PAAS	Yes
<b>Microsoft .NET Framework</b>	Application development platform	CSP PAAS	Yes
<b>Microsoft Active Directory Server</b>	User account and access management	VA NSOC	Yes
<b>Microsoft Internet Information Server</b>	Web server software	CSP PAAS	Yes
<b>VMWare VSphere ESXi</b>	Server virtualization software	CSP PAAS	Yes

### 3.3.1. System Criticality and High Availability

The VEMS application infrastructure will meet criticality requirements to ensure high availability of 99% uptime not to include regularly scheduled hardware and software maintenance. The VEMS cloud service provider will sign an enforceable SLA to meet the 99% uptime requirement. The cloud provider will also meet an SLA disaster recovery requirement to not lose more than two hours of data due to a failure as its Recovery Point Objective, and a recovery from any failure in four hours or less as its Recovery Time Objective. The VEMS cloud provider will allocate the appropriate resources to maintain the 99% uptime SLA including workload distribution for web service availability and manage multiple alternate site gateways for geographic failover inherent to large cloud provider designs.

There are many reasons an infrastructure or platform failure may impact the VEMS application availability including security incidents that cause a denial of service. Infrastructure or platform security incidents that are the root cause for an availability issue are counted against the 99% uptime SLA. The VEMS team will be responsible for any application failures or security incidents that cause an availability issue. Achieving a VEMS application ATO, applying strong application security vulnerability testing and patch management practices, performing periodic web application penetration testing, applying rigorous quality assurance measures, and having

timely incident response procedures will ensure the VEMS team will meet the 99% application uptime requirement.

### **3.3.1.1. HA/Fault Tolerance**

High Availability (HA) will be implemented and designed into all interactions of the COTS systems to include CRM, SharePoint, web server, etc. This design parameter will ensure that the horizontal scaling employed by the cloud provider will enhance user loading and ensure performance and reliability of the system.

**CRM Server-**Deploying Microsoft Dynamics CRM on a Network Load Balanced (NLB) server cluster is a supported way to get increased scalability and high availability performance from your CRM deployment. Using NLB, you can cluster multiple Windows 2008 servers together. It provides added scalability as you can easily add additional nodes to the cluster as your usage grows, and it provides high availability, because if one node fails, traffic will be routed to other servers in the cluster.

**DB Server-**The following SQL Server configurations are supported for use with Microsoft Dynamics CRM:

- Local
- Remote
- Mirrored
- Clustered

However, when implementing a hosted Microsoft Dynamics CRM solution, you should consider providing the benefit of high availability to customers and users through use of a fault tolerant configuration.

Although both mirrored and clustered SQL high availability configurations are supported, other components of CRM can also be installed on multiple machines (synchronous and asynchronous services, email router, etc.) to also provide high availability.

**Email Router-**The E-mail Router services may be deployed on one or more individual server(s), a Windows cluster for high availability and failover, or multiple Windows Clusters for scaled-out highly available solution. In a hosted CRM environment, it is recommended to deploy the email router in a high availability and failover configuration using Microsoft Windows Clustering.

### **3.3.1.2. Service Level Agreements and User Load**

EMS will be built to planned user loading over web and virtual desktop interfaces. These projections will be utilized to develop SLAs and hosting model for the cloud provider. When parameters change the cloud provider will be notified with sufficient notice to make infrastructure and platform modifications to ensure service delivery to the users. VEMS will be tested to ensure that the architecture and the hosting model meets or exceeds all uptime and performance SLAs.

Further SLAs will provide offsite backup, access controls, and other IA controls necessary to ensure FISMA conformance. This would incorporate full disaster recovery SLAs to include restoration times.

### **3.3.2. Special Technology**

This is currently Not Applicable.

### **3.3.3. Technology Locations**

This information has not yet been identified for this draft version.

### **3.3.4. Conceptual Infrastructure Diagram**

#### **3.3.4.1. Location of Environments and External Interfaces**

This has not yet been decided as of this draft version.

#### **3.3.4.2. Conceptual Production String Diagram**

This has not yet been finalized as of this draft version.

## **4. System Architecture**

This section outlines the system's hardware and software components.

### **4.1. Hardware Architecture**

The solution's hardware will be based on Windows-compliant hardware and provided by the cloud host IAW SLAs. The specifications for the hardware are dependent on the dynamic load of the solution. The decision to base the solution in a robust, on-demand cloud facilitates the growth or shrinkage of the necessary hardware to accommodate the changing business needs of the OSDBU and CVE organization.

### **4.2. Software Architecture**

The VEMS solution is a cloud-based solution accessed via virtual desktops using the on Microsoft Windows operating system. Once end users have been properly authenticated, they use the virtual desktop to access commonly available productivity software such as the Microsoft Dynamics Customer Relationship Management system and its integrated subcomponents – SharePoint, SQL Server, and the list of commercially available plug-ins listed previously.

Other components of the solution integrate through existing infrastructure. These items are:

- The VOIP interface provided by the Cisco Universal Call Connector. This component leverages the existing VOIP infrastructure and collaboration software already available in the VA
- The collection of web services provided by designated, secured gateways at the cloud's boundary. These web services gateways provide secured integration points between the cloud and the external data sources and data requestors whom have been properly authorized to provide or access cloud-based services.

The VEMS environment shall leverage Identity and Access Management (IAM) processes and tools to further strengthen security by implementing Single Sign-On (SSO), access privileges and defined user based roles to access VA web-based applications, federal and industry databases from all VA locations. The VEMS will to leverage the VA's preferred web Single Sign On solution once it has been made available to the project team.

As VEMS adopts the various user characteristics of Customer Relationship Management (CRM), workflow and queue management, data, document and validation management, it is key to implement additional security and access controls within the VA organization via ADFS and/or IAM tool(s) and processes with the following considerations:

- Automated user provisioning and de-provisioning of access to VA and/or external applications and databases.
- Compliance visibility to ensure access rights across services and provide centralized compliance reports across access rights, provisioning/de-provisioning, and end user and administrator activity.
- Centralized integration into central Active Directory (AD) or LDAP directory to seamlessly leverage and extend to new applications without modifications to firewalls. As VA users are added or removed from an Active Directory, access to cloud-based applications should be modified automatically, via industry standards like SSL.
- The maintenance and tracking of application versions and user management via cloud-based services needs to be considered as part of an overall application integration strategy.
- Centralized administration models for different applications to allow reporting, user and access management across VA and external cloud applications. Additionally, a defined security model needs to provide the right level of access to individual application administrators, to manage specific users and applications within the same IAM system.
- Mobile authentication through a single enterprise credentialed system, utilizing Single Sign on (SSO), Security Access Management Language (SAML), etc.
- If utilizing Active Directory Federation Services (ADFS), key factors are:
  - ADFS supports only SSO
  - No provisioning/de-provisioning
  - Provides limited SSO for applications that support SAML or WS-Fed.

### **4.3.Communications Architecture**

The VEMS solution operates in the cloud using a virtualized LAN with load-balanced application and data aggregation servers. The VEMS solution uses data provided by means of the public Internet that was provided by commercial data suppliers. This section describes the high-level data communications architecture between the VEMS solution and its suppliers of relevant data. As the project's requirements elaboration teams continue to investigate and expand the details of the data integration requirements, the requirements will be prioritized and duplications will be removed; subsequently the communications architecture will be enhanced to reflect those details.

The VEMS solution will use logical and physical data gateways to function as data integrity enforcement points to manage the inflow of data to the VEMS cloud. Data transmitted from the Internet (such as that provided by Dun & Bradstreet, LexisNexis, and other contracted data suppliers) will be validated for compliance with the service level agreements defining the business partner relationship with those companies. Data transmitted from the VA network will occur over a Trusted Internet Connection (TIC) and will be subjected to similar checks of validity and integrity. All gateway access will require authorization. All data will be transmitted using secured data transmission protocols such as HTTPS. Where necessary and feasible, data access (such as logging into the VEMS solution) and data transmission (such as requesting and receiving data from data suppliers) will be tracking for auditing purposes.

## **5. Data Design**

The solution will store both structured and unstructured data. Unstructured data (MS Word documents, PowerPoint presentations, PDFs, and VOIP recordings) will be assigned metadata to facilitate searching and retrieval operations. Structured data captured in the CRM application and web forms will be stored in MS SQL Server with associated metadata for retrieval and analytical reporting. This section outlines the design of the database management system (DBMS) and non-DBMS files associated with the system. All of the solution is constrained in the cloud to minimize data leakage. This information will primarily be described in the VEMS Data Dictionary document.

### **5.1.Database Management System Files**

The DB schemas will be provided in the VEMS DB schema document.

### **5.2.Non-Database Management System Files**

This information is still being identified as of this draft version.

## **6. Detailed Design**

This section describes the proposed design in detail. As the solution is constructed and deployment, the components represented in this section will be refined with details regarding the user interfaces, system interfaces, relevant hardware, and dependencies and constraints.

### **6.1.Hardware Detailed Design**

Exact hardware specifications have not yet been determined as of this draft version.

## 6.2. Software Detailed Design

### 6.2.1. Conceptual Design

This section introduces the conceptual information that establishes the basis for how the software will be built.

#### 6.2.1.1. Product Perspective

The VEMS solution will allow the OSDBU support staff to support, manage, and report on the VEMS verification process. The system will utilize out-of-the-box CRM capabilities – provide by Microsoft Dynamics CRM 2013, as well as some customized functionality allowed by the extensible CRM framework. Additionally, the COTS software will provide a technical platform to integrate with the enterprise Call Center and provide additional Case Management functionality.

The following highlights critical components of the VEMS solution:

#### CRM Customer Relationship Management

**Account Management:** CRM Dynamic's capability to manage data related to applicant organizations, companies and supporting organizations.

**Contact Management:** Capability to manage data related to persons related to the organization and relevant accounts or data providers.

#### CRM Case Management

**CRM Case Management** is an umbrella entity that will allow the user to manage all activities around a VEMS Verification process. The CRM Case Management capabilities include:

- **Activities management:** Phone Calls, To-Do, Email talk and custom activities such as document received, external contact from the portal etc.
- **Task Generation:** VEMS CRM will provide both user- and team-based task generation mechanisms and automated and manually-assigned activities that can start additional tasks and automated workflows based on the defined rules and parameters.
- **Service Request:** Case Management will include a Service Request queue that contains automated tasks, emails, notifications and alerts

#### CRM Workflow Management

VEMS CRM will use a collection of software components called Windows Workflow Foundation classes to manage automated and interactive processes and make workflow decisions based on defined business rules. Windows Workflow Foundation provides a runtime engine, a framework, a library of activities, and default implementations of the common runtime services. The Windows Workflow Foundation runtime engine manages the execution of system processes across extended periods of time as well as preserving the state of process execution during shutdown and restart.

The Microsoft Dynamics Workflow Designer will enable an authorized user to create and manage automated and interactive business processes. Also, Microsoft Dynamics allows developers to extend and customize the standard behavior of CRM processes using commonly available programming tools.

Processes are enabled as workflows in Dynamics CRM as:

- **Workflows** - The automated or asynchronous processes that may require user input to start them. Further, these processes do not require user input to run them to completion. These processes run in the background.
- **Dialogs** - The interactive or synchronous processes that require user input to start and run them to completion. When you start the dialog process, a wizard-like interface is presented to you so you can make appropriate selections to run the process.

### **Veteran Affairs Mid-Tier Services**

The Department of VA, through its programs like the Veteran Relationship Management (VRM) system, has established a Service Oriented Architecture (SOA) and developed reusable services across the enterprise, delivering Veteran benefit and health data. Veteran data resides in multiple authoritative sources and web-services are available to deliver this data to various lines of business. The VEMS solution consumes web-services based on common standards for data exchange and integration. Microsoft Dynamics will access any of these services uses SOAP and/or REST services.

The following are the VA Mid-Tier Services in consideration for the VEMS CRM Solution:

- **Benefit Gateway Services (BGS):** BGS Services deliver VBA Compensation and Pension related data that includes veteran's person info, demographics and disability rating. Multiple web-based applications including CRM and e-Benefits are using these services. BGS services also provide access to the BIRLS data.

### **CRM Plug-In Management**

A 'plug-in' is customized business logic represented as programmatic code that integrates with Microsoft Dynamics CRM to modify the standard behavior of the platform. Plug-ins can subscribe to a known set of events that request the CRM platform to execute code when the predefined event occurs.

For example, the VEMS CRM library of plug-ins will allow the CRM application to:

- Make in-process data calls to external data sources
- Pass data between plug-ins
- Render external data onto CRM forms

Examples of these components are listed in the architecture as BS Connector for Dynamics CRM, AutoMerge for Dynamics CRM PowerPivot, and WhosOnLive Chat.

### **CRM Database**

- Microsoft Dynamics CRM uses the latest version of Microsoft SQL Server, SQL Server 2012, for persistent data storage
- SQL Server Reporting Services: SQL Server Reporting Services provides a full range of tools and services to deploy, extend, and manage reports. SQL Server Reporting Services creates interactive, tabular, graphical, or free form reports from relational, multidimensional, or XML-based data sources. Reports will include data visualization. Reports will be available as both standardized and ad-hoc, on-demand formats and report data be represented as Excel workbooks, PDFs, and common-delimited files. Pre-defined end users will receive alerts on reports published to the SharePoint serve when critical report data changes. SQL Server Reporting Services allows the CRM platform to request data via web-services as well SQL database queries.

### **CRM Interactive Dashboards**

Data visualization and analytics in Microsoft Dynamics CRM are represented as configurable dashboards for each user and for predefined group members. The following elements constitute the visualization and analytics abilities in Microsoft Dynamics CRM:

- **Visualizations:** Visualizations present data graphically as charts. Charts aggregate data from Microsoft Dynamics CRM to report on pre-defined metrics and tasked items.
- **Dashboards:** Dashboards act as a business intelligence tool in Microsoft Dynamics CRM by providing a snapshot of data in various forms. Dashboards can present data as a variety of charts and grids, The CRM data dashboard acts as a virtual container for these objects, and can simultaneously present data from up to six visualizations, grids, IFRAMES, or Web resources.

### **CRM Document Management**

Microsoft Dynamics integrates with the Microsoft SharePoint solution to provide a scalable document management framework using role-based access mechanisms to protect data. The solution will store Personally Identifiable Information (PII), so the solution will be ‘hardened’ to protect unauthorized access to this information.

The sources of documents to be processed by the VEMS solution are:

- Documents submitted from external sources (Veterans or their designated proxies, Customer Service Representatives, Application Coaches).
- Documents submitted by internal users (typically using CRM or the Outlook Plug-in for CRM)

VEMS requires that data management shall be in accordance with records management laws and policies including OSDDBU business rules, the NARA Basic Laws and Authorities, February 2008 Revision, and DOD 5015.2. The Department of Defense has approved a collection of software products that provide compliance with DOD5015.2, but the products approved on the VA’s TRM does not align with the DoD’s requirements for ‘classified’ document storage. Candidate technologies to satisfy this additional level of hardening are being reviewed for consideration. If necessary, the VA TRM committee may be required to provide a waiver for these additional products (or relax the requirement).



### 6.2.1.2. Communications Interfaces

The VEMS solution communicates with other systems using the secured HTTP (HTTPS) protocol. These interfaces are still being reviewed and defined and will be represented in the System Design Document as they are clarified, prioritized, and duplications are removed.

### 6.2.1.3. Product Features

This subsection provides a summary of the major features of the software in alignment with the major phases of the verification process

#### Phase One: Pre-Submission Phase

**Table 11: Pre-submission Activities and Required Functionality**

Performed By	Task Description	Required CRM Functionality
Applicant	Review CFR 38 Part 74	<ul style="list-style-type: none"> <li>Content Delivery Network</li> </ul>
Applicant	Complete online/offline self-assessment	<ul style="list-style-type: none"> <li>Content Delivery Network Online Form Submission</li> </ul>
Applicant	Review required documentation matrix	<ul style="list-style-type: none"> <li>Content Delivery Network Online Form Submission</li> </ul>
Applicant	Create business profile on VetBiz.gov	<ul style="list-style-type: none"> <li>Web Svc Integration</li> </ul>
Applicant	Request a verification coach (Optional)	<ul style="list-style-type: none"> <li>Content Delivery Network Assign Task Co-Owners</li> </ul>
Applicant	Complete CVE submission application	<ul style="list-style-type: none"> <li>Account Creation</li> <li>Content Delivery Network Online Form Submission</li> <li>Document Scanning/OCR</li> <li>Document Management</li> <li>Data Quality Check</li> <li>Web Chat</li> <li>Computer Telephony Integration</li> </ul>
System	Start Submission Timer	<ul style="list-style-type: none"> <li>Activity Timers</li> <li>Auditing</li> <li>Email Notification</li> <li>Customized Notifications</li> <li>Data Quality Check</li> </ul>
	<i>Continue to Phase Two: Examination Phase</i>	

## Phase Two: Initiation Phase

**Table 12: Initiation Activities and Required Functionality**

Performed By	Task Description	Required CRM Functionality
<b>System and Eval Staff</b>	Score submitted data	<ul style="list-style-type: none"> <li>• Scoring Algos</li> <li>• Auditing</li> <li>• Predictive Analysis (BI)</li> </ul>
<b>Eval Staff</b>	Validate Data <ul style="list-style-type: none"> <li>• Assess for clarity and completeness</li> <li>• Check External Data Registries for corroboration</li> </ul>	<ul style="list-style-type: none"> <li>• Task Owner Assignment</li> <li>• Serial/Parallel workflows</li> <li>• Checklists</li> <li>• Customized data capture forms</li> <li>• Personalized bookmarks</li> <li>• Web Services Integration</li> <li>• Auditing</li> <li>• Activity Timers</li> </ul>
<b>Eval Staff &amp; Applicant</b>	Contact application to resolve issues, omissions, questions, etc.	<ul style="list-style-type: none"> <li>• Email</li> <li>• Customized Letter generation</li> <li>• VOIP integration/recording</li> <li>• Document Management</li> <li>• OCR</li> <li>• SharePoint Integration</li> <li>• Checklists</li> <li>• Activity Timers</li> <li>• WebChat</li> <li>• Computer Telephony Integration</li> </ul>
<i>If success (complete and accurate), continue to Exam Phase</i>		<ul style="list-style-type: none"> <li>• QA Algos</li> <li>• Activity Timers</li> <li>• Email</li> <li>• Customized Notification/ Alerts</li> </ul>
<i>If failure (incomplete and exceeds timers), send withdrawal letter</i>		<ul style="list-style-type: none"> <li>• Letter Generation</li> <li>• Auditing</li> <li>• Activity Timers</li> <li>• Reminders/Alerts</li> </ul>

### Phase Three: Examination Phase

**Table 13: Examination Activities and Required Functionality**

Performed By	Task Description	Required CRM Functionality
<b>System and Exam Staff</b>	Score submitted data	<ul style="list-style-type: none"> <li>• Scoring Algos</li> <li>• Auditing</li> <li>• Predictive Analysis (BI)</li> </ul>
<b>Exam Staff</b>	Conduct Examination Assessment <ul style="list-style-type: none"> <li>• Review documentation to-date</li> <li>• Review/capture remarks</li> <li>• Review/capture correspondence</li> <li>• Review/capture historical profile data and/or submission/rejection data</li> <li>• Review / capture VOIP messages</li> </ul>	<ul style="list-style-type: none"> <li>• Task Owner Assignment</li> <li>• Serial/Parallel workflows</li> <li>• Checklists</li> <li>• Customized data capture forms</li> <li>• Personalized bookmarks</li> <li>• Web Services Integration</li> <li>• Auditing</li> <li>• Activity Timers</li> <li>• VIP accounts</li> <li>• Escalated task assignments</li> <li>• Risk Profiling / QA process profiling</li> <li>• Activity timers Web Chat</li> <li>• Computer Telephony Integration</li> </ul>
<b>Exam Staff</b>	Gather additional data for verification Websites Web Services Emails, phone calls, scanned documents	<ul style="list-style-type: none"> <li>• Email</li> <li>• Customized Letter generation</li> <li>• VOIP integration/recording</li> <li>• Document Management</li> <li>• OCR</li> <li>• Escalated task assignments</li> <li>• Risk Profiling / QA process profiling</li> <li>• Activity timers</li> <li>• SharePoint Integration</li> <li>• Checklists</li> <li>• Activity Timers</li> <li>• Auditing</li> <li>• Customized Quality Control policies</li> <li>• Web Chat</li> <li>• Computer Telephony Integration</li> </ul>
<b>Exam Staff (system)</b>	Assign preliminary risk score	<ul style="list-style-type: none"> <li>• QA Algos</li> <li>• Customized Notification/ Alerts</li> </ul>
<b>Exam Staff (system)</b>	Send and collect supervisor's signature	<ul style="list-style-type: none"> <li>• Letter Generation</li> <li>• eSignature</li> <li>• Role-based task assignment</li> <li>• Auditing</li> </ul>

Performed By	Task Description	Required CRM Functionality
		<ul style="list-style-type: none"> <li>• Activity Timers</li> <li>• Reminders/Alerts</li> </ul>

#### Phase Four: Evaluation Phase

**Table 14: Evaluation Activities and Required Functionality**

Performed By	Task Description	Required CRM Functionality
<b>System and Eval Staff</b>	Score submitted data	<ul style="list-style-type: none"> <li>• Scoring Algos</li> <li>• Auditing</li> <li>• Predictive Analysis (BI)</li> </ul>
<b>Eval Staff</b>	Conduct Evaluation Assessment <ul style="list-style-type: none"> <li>• Review documentation to-date</li> <li>• Review/capture remarks</li> <li>• Review/capture correspondence</li> <li>• Review/capture historical profile data and/or submission/rejection data</li> <li>• Review / capture VOIP messages</li> </ul>	<ul style="list-style-type: none"> <li>• Task Owner Assignment</li> <li>• Serial/Parallel workflows</li> <li>• Checklists</li> <li>• Customized data capture forms</li> <li>• Personalized bookmarks</li> <li>• Web Services Integration</li> <li>• Auditing</li> <li>• Activity Timers</li> <li>• VIP accounts</li> <li>• Escalated task assignments</li> <li>• Risk Profiling / QA process profiling</li> <li>• Activity timers</li> </ul>
<b>Eval Staff</b>	Validate Examiner's Recommendation	<ul style="list-style-type: none"> <li>• Rule-based task owner assignments</li> <li>• Email</li> <li>• VOIP integration/recording</li> <li>• Document Management</li> <li>• Escalated task assignments</li> <li>• Risk Profiling / QA process profiling</li> <li>• Activity timers</li> <li>• SharePoint Integration</li> <li>• Checklists</li> <li>• Activity Timers</li> <li>• Auditing</li> <li>• Customized Quality Control policies</li> </ul>
<b>Eval Staff (system)</b>	Assign preliminary Eval Recommendation score	<ul style="list-style-type: none"> <li>• QA Algos</li> <li>• Customized Notification/ Alerts</li> <li>• Auditing</li> </ul>

<b>Eval Staff</b>	Determine Final Eval Recommendation	<ul style="list-style-type: none"> <li>• Letter Generation</li> <li>• eSignature</li> <li>• Role-based task assignment</li> <li>• Auditing</li> <li>• Activity Timers</li> <li>• Reminders/Alerts</li> </ul>
<b>Eval Staff</b>	Draft Determination or Disposition Letter and forward to supervisor	<ul style="list-style-type: none"> <li>• Email</li> <li>• Letter Generation</li> <li>• SharePoint integration</li> <li>• Rule-based Notifications/ Alerts</li> </ul>
<b>Eval Staff</b>	Review Paralegal Team's Work	<ul style="list-style-type: none"> <li>• Role-based task ownership</li> <li>• Reminders/Alerts</li> <li>• Email</li> <li>• VOIP</li> <li>• SharePoint integration</li> </ul>
<b>Eval Staff</b>	Draft Approval Letter	<ul style="list-style-type: none"> <li>• Letter generation</li> <li>• SharePoint integration</li> <li>• Notes/remarks</li> </ul>
<b>Is Site Visit Recommended?</b>	If Yes, continue to On Demand Phase 1 – Site Visit If No, continue	<ul style="list-style-type: none"> <li>• Rule-based workflow</li> <li>• Activity timers</li> <li>• Notifications/alerts</li> </ul>
<b>Eval Team</b>	Forward determination letter to Director/Deputy Director	<ul style="list-style-type: none"> <li>• Rule-based workflow</li> <li>• eSignature</li> <li>• SharePoint Integration</li> <li>• Email</li> <li>• VOIP</li> <li>• Auditing</li> <li>• Activity Timers</li> </ul>
<b>Eval Team</b>	Notify applicant	<ul style="list-style-type: none"> <li>• Email</li> <li>• Computer Telephony Integration</li> <li>• Auditing</li> <li>• Activity Timers</li> </ul>

## On-Demand Phase 1: Site Visit [Mobile User]

**Table 15: Site Visit Activities and Required Functionality**

Performed By	Task Description	Required CRM Functionality
<b>System and Exam Staff</b>	Score submitted data	<ul style="list-style-type: none"> <li>• Scoring Algos</li> <li>• Auditing</li> <li>• Predictive Analysis (BI)</li> </ul>
<b>Exam Staff</b>	Prepare Site Visit Materials <ul style="list-style-type: none"> <li>• Review documentation to-date</li> <li>• Review/capture remarks</li> <li>• Review/capture correspondence</li> <li>• Review/capture historical profile data and/or submission/rejection data</li> <li>• Review / capture VOIP messages</li> <li>• Create/update site visit log</li> <li>• Collaborate on goals/outcomes</li> <li>• Schedule site visit</li> </ul>	<ul style="list-style-type: none"> <li>• Task Owner Assignment</li> <li>• Serial/Parallel workflows</li> <li>• Checklists</li> <li>• Customized data capture forms</li> <li>• Personalized bookmarks</li> <li>• Web Services Integration</li> <li>• Auditing</li> <li>• Activity Timers</li> <li>• VIP accounts</li> <li>• Escalated task assignments</li> <li>• Risk Profiling / QA process profiling</li> <li>• Personalized Journals/checklists</li> <li>• Email</li> <li>• Letter generation</li> <li>• Online document review</li> <li>• Shared Calendars</li> <li>• Generate meetings/appointments</li> </ul>
<b>Exam Staff</b>	Prepare Site Visit Report <ul style="list-style-type: none"> <li>• Update documentation to-date</li> <li>• Review/capture remarks</li> <li>• Review/capture correspondence</li> <li>• Review/capture historical profile data and/or submission/rejection data</li> <li>• Review / capture VOIP messages</li> <li>• Update site visit log</li> </ul>	<ul style="list-style-type: none"> <li>• Email</li> <li>• Customized Letter generation</li> <li>• VOIP integration/recording</li> <li>• Document Management</li> <li>• OCR</li> <li>• Escalated task assignments</li> <li>• Risk Profiling / QA process profiling</li> <li>• Activity timers</li> <li>• SharePoint Integration</li> <li>• Checklists</li> <li>• Activity Timers</li> <li>• Auditing</li> <li>• Personalized Journals/checklists</li> <li>• Email</li> <li>• Letter generation</li> <li>• Online document review</li> <li>• Shared Calendars</li> <li>• Generate meetings/appointments</li> </ul>

		<ul style="list-style-type: none"> <li>•</li> </ul>
<b>Exam Staff (system)</b>	Assign preliminary risk score	<ul style="list-style-type: none"> <li>• QA Algos</li> <li>• Customized Notification/ Alerts</li> </ul>
<b>Exam Staff (system)</b>	Store/send Site Visit Report for Evaluation Team	<ul style="list-style-type: none"> <li>• Records Management</li> <li>• SharePoint integration</li> <li>• eSignature</li> <li>• Role-based task assignment</li> <li>• Auditing</li> <li>• Activity Timers</li> <li>• Reminders/Alerts</li> </ul>

## On-Demand Phase 2: Customer Service Center

**Table 16: Call Center Activities and Required Functionality**

Performed By	Task Description	Required CRM Functionality
<b>System</b>	Accept incoming call	<ul style="list-style-type: none"> <li>• IVR</li> <li>• Web Chat</li> <li>• Computer Telephony Integration</li> <li>• Rule-based Task Owner Assignment</li> </ul>
<b>System</b>	Accept incoming email	<ul style="list-style-type: none"> <li>• Rule-based Task Owner Assignment</li> <li>• Serial/Parallel workflows</li> <li>• Role-based routing</li> <li>• Personalized bookmarks</li> <li>• Web Services Integration</li> <li>• Auditing</li> <li>• Activity Timers</li> <li>• VIP accounts</li> <li>• Escalated task assignments</li> <li>• Risk Profiling / QA process profiling</li> <li>• Personalized Journals/checklists</li> <li>• Email</li> <li>• Letter generation</li> <li>• Online document review</li> <li>• Notifications/Alerts</li> <li>• Reminders</li> </ul>
<b>Exam Staff</b>	Handle Call using Scripts and Update Account Record (Case mgmt.)	<ul style="list-style-type: none"> <li>• Email</li> <li>• Customized Letter generation</li> <li>• VOIP integration/recording</li> <li>• Escalated task assignments</li> <li>• Risk Profiling / QA process profiling</li> <li>• Activity timers</li> </ul>

		<ul style="list-style-type: none"> <li>• SharePoint Integration</li> <li>• Checklists</li> <li>• Activity Timers</li> <li>• Auditing</li> <li>• Letter generation</li> <li>• Online document review</li> <li>• Shared Calendars</li> <li>• Generate meetings/appointments</li> <li>• Notes</li> <li>• Web Chat</li> <li>• Computer Telephony Integration</li> </ul>
<b>Exam Staff (system)</b>	Handle email using SOPs and Update Account Record (case mgmt.)	<ul style="list-style-type: none"> <li>• Email</li> <li>• Customized Letter generation</li> <li>• VOIP integration/recording</li> <li>• Escalated task assignments</li> <li>• Risk Profiling / QA process profiling</li> <li>• Activity timers</li> <li>• SharePoint Integration</li> <li>• Checklists</li> <li>• Activity Timers</li> <li>• Auditing</li> <li>• Letter generation</li> <li>• Online document review</li> <li>• Shared Calendars</li> <li>• Generate meetings/appointments</li> <li>• Notes</li> </ul>
<b>Exam Staff (system)</b>	Store/send Site Visit Report for Evaluation Team	<ul style="list-style-type: none"> <li>• Records Management</li> <li>• SharePoint integration</li> <li>• eSignature</li> <li>• Role-based task assignment</li> <li>• Auditing</li> <li>• Activity Timers</li> <li>• Reminders/Alerts</li> </ul>

Note: Not all workflows are represented above. Some workflows such as the Status Protests, Requests for Reverification, Congressional and Executive Inquires processes are on-demand, situational procedures that utilize the same features and functionality of the VEMS solution as those listed above.



#### **6.2.1.4. User Characteristics**

End users of the VEMS solution should have experience with the Microsoft Office productivity suite (Outlook, Word, PowerPoint, Excel, and Internet Explorer). As the solution utilizes virtualized desktops installed in the cloud, experience with Microsoft Remote Desktop, Microsoft Terminal Services, or Citrix XenApp would be preferred. VEMS training materials will include materials to cover these technologies as part of the deployment.

### **6.3. Communications Detailed Design**

The communications detailed design has not been finalized as of this draft version.

## **7. External Interface Design**

As described in the scope statement, the following integrated services are part of the VEMS system:

- Benefits Gateway Services (BGS)
  - Beneficiary Identification Records Locator Subsystem (BIRLS)
- Defense Manpower Data Center (DMDC)
- Master Veteran Index (MVI)
- DS Logon
- System for Award Management (SAM)
  - Excluded Parties List System (EPLS)
  - Central Contractors Registry (CCR)
  - Online Representations and Certifications Application (ORCA)
  - Federal Agency Registration (FedReg)
- Correspondence Tracking System
- Dun and Bradstreet (D&B)
- LexisNexis
- Experian
- Westlaw

In addition, other external interfaces include:

- VA Exchange Services
- VA Cisco VoIP services
- VA Lync\LiveMeeting Services

### **7.1. Interface Architecture**

This architecture is still being designed as of this draft version.

### **7.2. Interface Detailed Design**

This information will be provided as part of the delivery of VEMS interface control documents for external systems,

## 8. Human-Machine Interface

The User Interface design is still under development at the time of this draft version.

## 9. System Integrity Controls

This information is currently unavailable as of this draft version.

## 10. Appendix A

### 10.1. Requirements Traceability Matrix

The Requirements Traceability Matrix is still under development as of this draft version.

### 10.2. Packaging and Installation

This information is currently unavailable as of this draft version.

### 10.3. Design Metrics

This information is currently unavailable as of this draft version.

### 10.4. Glossary of Terms

The following acronyms are used throughout this documentation. The table below provides the elaborated named reference for each acronym and can function as a glossary for commonly used acronyms in the VEMS solution documentation.

**Table 17 Glossary of Terms**

Term	Meaning
ADA	Americans with Disabilities Act
ADFS	Active Directory Federated Services
ALGOS	Algorithms
ATO	Authority to Operate
BEP	Benefits Enterprise Platform
BGS	Benefits Gateway System
CCR	Central Contractor's Registry
COTS	Commercial, Off-The-Shelf
CPARS	Contractor Performance Assessment Reporting System
CRM	Customer Relationship Management
CTS	Correspondence Tracking System
CVE	Center for Verification and Evaluation

D&B	Dun & Bradstreet
DBMS	Data Base Management System
DES	Disability Evaluation System
DMDC	Defense Manpower Data Center
DSBS	Dynamic Small Business Search system
EA	Enterprise Architecture
EPLS	Excluded Parties List System
EVS	Enterprise Voice System
FedRAMP	Federal Risk and Authorization Management Program
FedReg	Federal Registry
FIPS	Federal Information Processing Standard
FISMA	Federal Information Security Management Act
IA	Information Assurance
IAM	Information Access Management
IRS	Internal Revenue Service
IT	Information Technology
LDAP	Lightweight Directory Access Protocol
M&S	Modeling & Simulation
MVI	Master Veterans Index
NIST	National Institute of Standards and Technologies
OCR	Optical Character Recognition
OSDBU	Office of Small and Disadvantaged Business Utilization
PDF	Portable Document Format
PII	Personal Identification Information
PPIRS	Past Performance Information Retrieval System
PMO	Project Management Office
SAM	System for Award Management
SAML	Security Access Management Language
SLA	Service Level Agreement
SBA	Small Business Administration

SEDR	System Engineering Design Review
SOA	Service Oriented Architecture
SQL	Structured Query Language
SSO	Single Sign On
TRM	Technical Reference Model
VA	Department of Veterans Affairs
VDNS	Veteran's Death Notification System
VGP	VetGov Partner portal
VEMS	Veteran's Enterprise Management System
VOIP	Voice Over Internet Protocol
3PAO	Third Party Assessment Organization

## 10.5. Required Technical Documents

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

- Product Architecture Document;
- Disaster Recovery Plan;
- Interface Data Mapping
- Conformance Validation Statement (CVS) - Section 508

For additional information regarding how to obtain proper approval for this project, refer to the following documents:

- IT Infrastructure Standards
- Systems Engineering and Design Review (SEDR) process
- Enterprise Architecture Web page
- One-VA TRM

## Attachment A - Approval Signatures

This section is used to document the approval of the System Design Document during the Formal Review. The review should be ideally conducted face to face where signatures can be obtained 'live' during the review however the following forms of approval are acceptable:

1. Physical signatures obtained face to face or via fax
2. Digital signatures tied cryptographically to the signer
3. /es/ in the signature block provided that a separate digitally signed e-mail indicating the signer's approval is provided and kept with the document

The Chair of the governing Integrated Project Team (IPT), Business Sponsor, IT Program Manager, Project Manager, and the members of the Technical and Enterprise Architectural Review Team are required to sign. . Until the Engineering and Architecture Review Board is stood up, both the Engineering IPT member(s) and the Architecture IPT member(s) must approve/sign the SDD. Please annotate signature blocks accordingly.

---

Signed: \_\_\_\_\_ Date: \_\_\_\_\_  
< *Integrated Project Team (IPT) Chair* >

---

Signed: \_\_\_\_\_ Date: \_\_\_\_\_  
< *Business Sponsor* >

---

Signed: \_\_\_\_\_ Date: \_\_\_\_\_  
< *IT Program Manager* >

---

Signed: \_\_\_\_\_ Date: \_\_\_\_\_  
< *Project Manager* >

---

Signed: \_\_\_\_\_ Date: \_\_\_\_\_  
< *Enterprise Architecture*>

---

Signed: \_\_\_\_\_ Date: \_\_\_\_\_  
< *Service Delivery and Engineering* >