

**Department of Veterans Affairs  
OI&T Innovations Program  
Radiology Protocol Tool and Reporter  
(RAPTOR)  
Project Management Plan**

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**Submitted By:**

**SAN Business Consultants, LLP,**

**11414 Ramsburg Court**

**North Potomac, MD 20878**

**[www.sanbusinessconsultants.com](http://www.sanbusinessconsultants.com)**

**240 350 5127**

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## TABLES OF CONTENT & FIGURES

<b>PROJECT DEFINITION.....</b>	<b>4</b>
1.1 BACKGROUND.....	4
1.2 PROJECT OBJECTIVES.....	6
1.3 WBS.....	8
<b>2 PROJECT MANAGEMENT APPROACH.....</b>	<b>16</b>
2.1 STAKEHOLDERS AND RESOURCES .....	16
<b>3 METHODOLOGY AND TOOLS.....</b>	<b>18</b>
3.1 BIMONTHLY PROGRESS REPORTS .....	18
3.2 PROJECT CHANGE CONTROL PROCESS .....	18
3.3 QUALITY MANAGEMENT APPROACH .....	19
3.4 RISK MANAGEMENT APPROACH .....	20
3.5 PERFORMANCE MEASURES .....	20
 FIGURE 1 CURRENT WORKFLOW FROM ORDER TO SCHEDULE.....	 5
FIGURE 2 CURRENT PROTOCOL WORKFLOW FROM SCHEDULE TO REPORT .....	5
FIGURE 3 RAPTOR REPLACES PAPER PROCESS .....	8
FIGURE 4 APPROACH OF PROJECT FROM DESIGNING AND PROTOTYPING IN DRUPAL, D. NORDIN, 2012.....	16
FIGURE 5 SNAPSHOT OF SANDBOX TICKETS ENTERED BY DEVELOPMENT TEAM .....	19

### Change Record

Version	Date	Revision Description
1.0	Oct. 7 2013	Initial Submission
1.1	Oct. 9, 2013	Updates based on feedback
1.2	Dec. 14 2013	Updates based on Dec. release
1.3	Feb. 7 2014	Updated Submission
1.4	Mar. 18 2014	Updates based on March 2014 release demo



## **Project Definition**

This project will build RAPTOR, the Radiology Protocol Tool and Reporter. RAPTOR is an electronic protocol workflow application that will utilize open-source open-standards web-based development platform and tools. This project will deliver a functional application that interoperates with VistA.

### **1.1 Background**

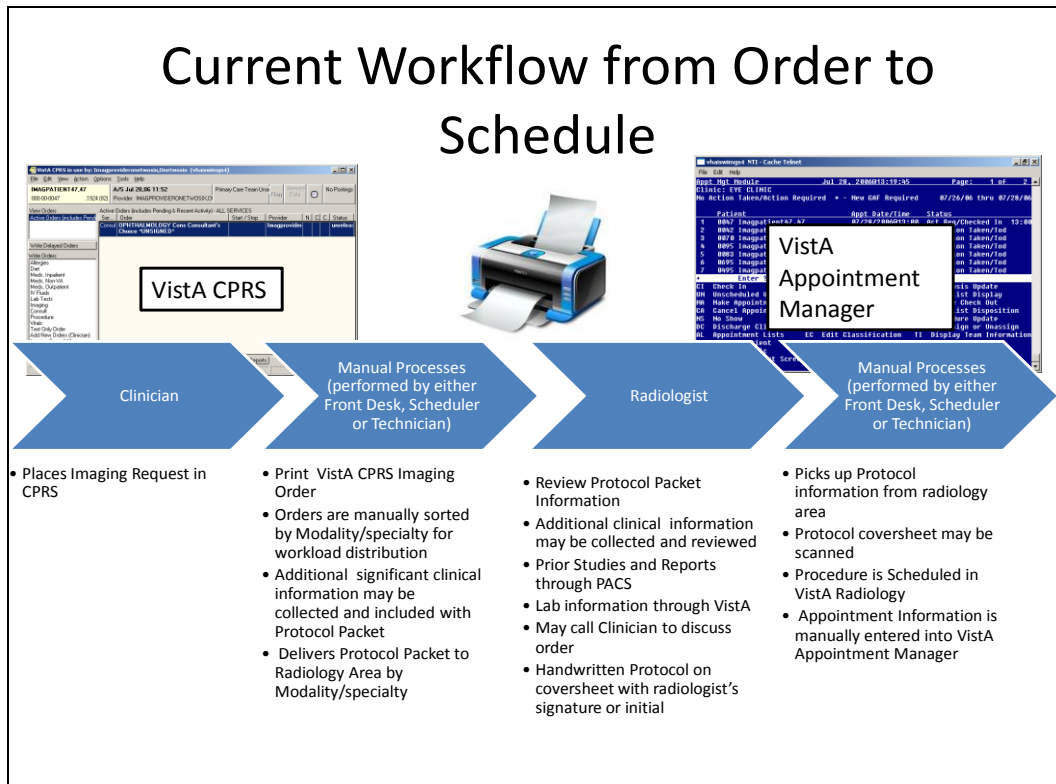
Currently, VA Radiologists review all clinician orders for advanced diagnostic imaging (Computerized Tomography, Magnetic Resonance Imaging, and Nuclear Medicine tests) and assign specific protocol instructions directing how each examination must be performed so that the clinical questions are answered. This is standard practice and typically paper based.

VA Radiologists frequently do not receive sufficient information on exam requisitions to optimize the quality and safety of their protocol decisions. Efforts to augment the clinical detail provided by the ordering provider can be cumbersome and negatively impact Radiologist productivity and department efficiency.

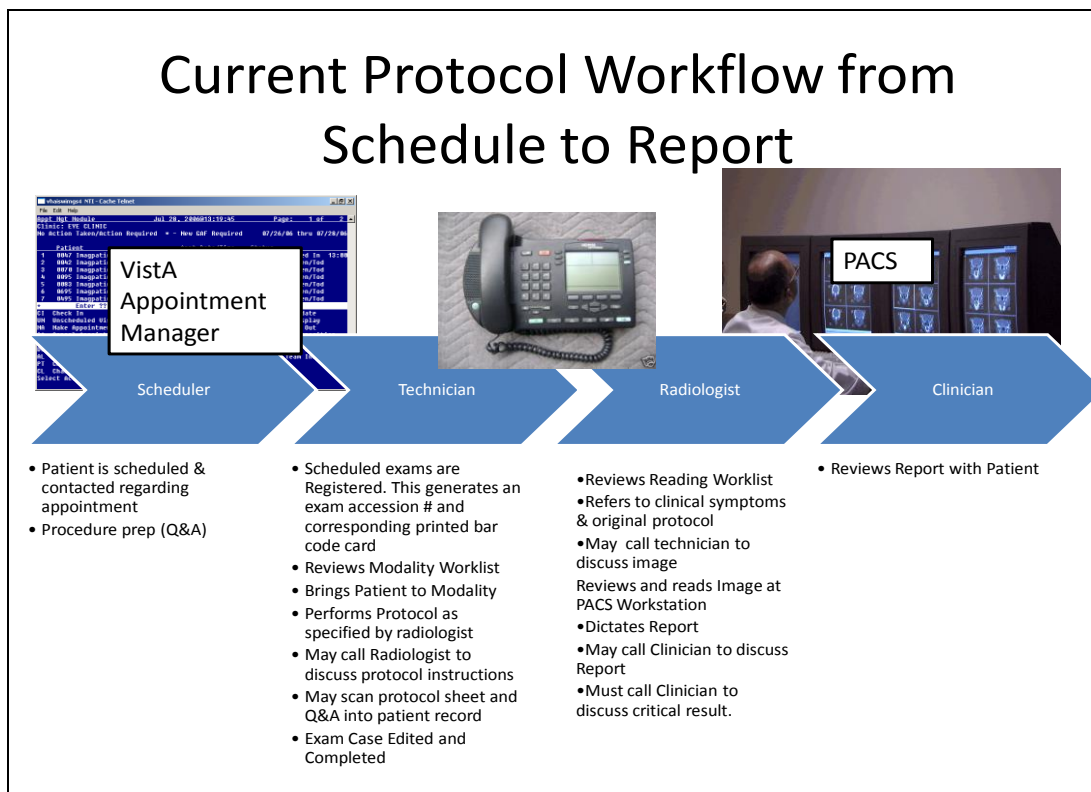
Paper processes have inherent shortcomings. Lost and duplicated exam requests negatively impact efficiency. Information necessary for optimized protocol selection can be missing from paper processes and cumbersome to obtain if data is stored in disparate health information repositories, negatively impacting quality of care. Recordable electronic transactions assure documentation of responsibility and provision of secure provider communication protects patient privacy. Electronic emulators of paper processes are at risk of providing non-optimized functionality and falling short of efficiency and quality targets if sufficient systems interoperability is not achieved. Health system requirements e.g. consent for contrast agents, application of conscious sedation protocols and documentation of order changes within an optimized environment for advanced imaging protocoling decisions. Utilization of open standard, open source architecture and tools to support reliable functionality, maintainable extensions and minimize ownership costs and development time predict accessibility, versatility and scalability.

The figures below illustrate the typical current manual radiology process from order request to procedure protocol to schedule patient though imaged and reported.

**Figure 1 Current Workflow from Order to Schedule**



**Figure 2 Current Protocol Workflow from Schedule to Report**



## 1.2 Project Objectives

The Radiology Protocol Tool and Reporter (known as RAPTOR) will:

- Leverage VHA information systems to maximize Radiologist advanced imaging protocoling effectiveness while preserving productivity.
- Protocol decisions will occur within a tailored electronic environment displaying and coordinating functionality of all information and resources needed to make rapid, informed protocol decisions and actions.
- Provide to Radiologists
  - Exam order
  - Access to all pertinent textual data (allergies, medications, provider notes, imaging reports, ionizing radiation exposure history, etc.)
  - Initially presented data will be filtered for relevance
  - Access to previous imaging exams (the actual image data)
  - Protocol action space (to record protocol decision and need for patient informed content or conscious sedation)
  - Messaging portal to streamline (and catalog) non-urgent communication with referring providers, when necessary

Process attributes were defined and opportunities to leverage information systems interoperability and process functionality improvements were identified to guide development of a comprehensive electronic solution. Attribute comparison between existing paper and identified existing local VA electronic advanced medical imaging solutions with optimized prototype design:

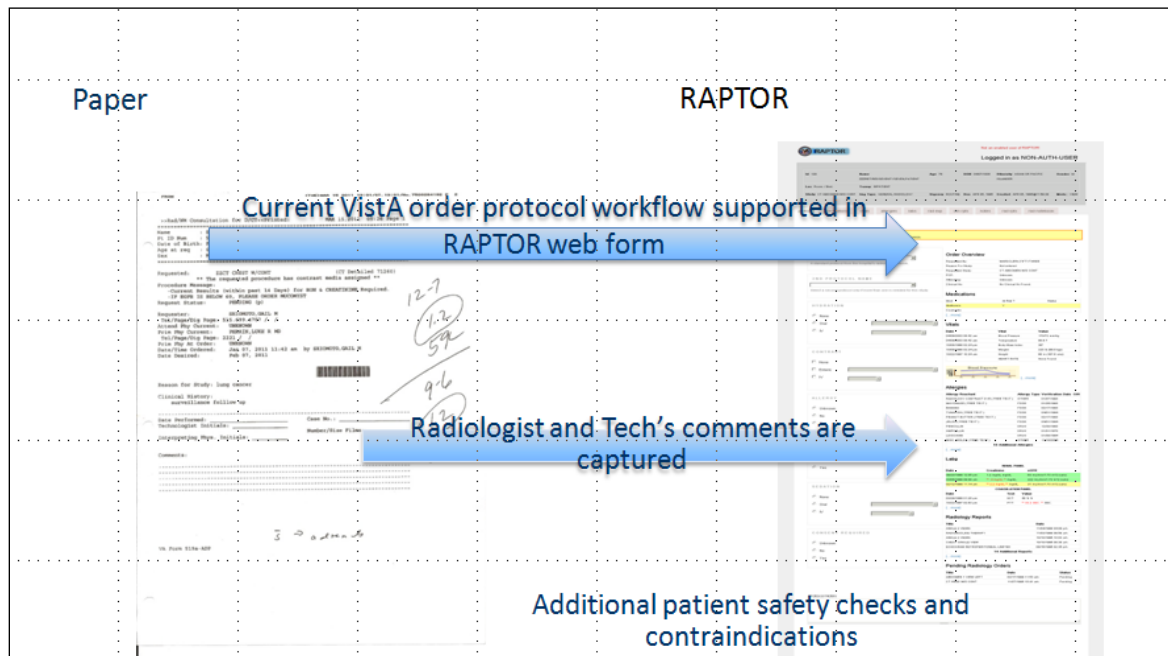
**Table 1 Comparison between paper and RAPTOR**

Attribute	Existing Paper Processes	RAPTOR Solution
Environment	Paper	Web – based
Level of interoperability	Paper or scanned paper	Computational electronic data
User access	Poor security controls	Access through authenticated secure services
User roles	Radiologists, Technologists, Schedulers	Radiologists, Technologists, Schedulers & System Administrators
Interface – textual input	Manual	CPRS orders
Interface – images & reports & clinical data	Not integrated, cumbersome	Integrated information dashboard, optimized data access
Signature	Technologist & radiologist	Digital

<b>Attribute</b>	<b>Existing Paper Processes</b>	<b>RAPTOR Solution</b>
	initials on paper form	
Record management	Can be scanned into EHR, but typically shred	Saved and accessible for management
Workflow distribution	Paper stack	Work list
Urgency	Listed; not prioritized	Prioritized
Communications with requestor	Telephone contact listed, but not integrated	Electronic text comments and secure messaging
Communications with technician	Freehand text comments field	Electronic text comments and secure messaging
Provider alerts	Not automated	Automated detection of patients at high risk for IV contrast administration (allergies, renal function, informed consent flag), and repeat/duplicated exams.
Availability	24/7	24/7
Contrast dosing recording	No	Yes

Evaluation of existing paper-based and electronic advanced imaging protocol assignment processes in use within the VHA enterprise has identified inefficiencies as well as opportunity for innovative solutions to improve productivity, quality and patient safety. Lessons learned are applicable to the broader health care marketplace.

**Figure 3 RAPTOR replaces paper process**



RAPTOR will pilot “optimized” electronic protocol functionality using “open-source, open-standard” methodology where possible and practical. According to the VistA Modernization Strategy, “open-source, open standards”. (VistA Modernization Report, Legacy to Leadership, May 2010 ref. <http://www.scribd.com/doc/32083560/VistA-Modernization-Report-Legacy-to-Leadership-May-4-2010>) technology should be targeted. SAN shall review “open-source, open standards” to determine the best technology platform for the RAPTOR application.

### 1.3 WBS

Table 2 below shows the project tasks, start and finish date and their resources. The WBS development release schedule can be summarized as a fifteen month development project with five planned quarterly releases. Additional unscheduled releases may occur during the project. All the releases will occur in the sandbox and the last release will also occur on the production servers.

Each release’s functionality will include VA inspection and/or testing procedures to verify application behavior. The last release will be used to complete UAT and will occur in both the sandbox and on the production servers.



**Table 2 Project WBS**

#	Task Name	Start	Finish	Resource Names	Status
	<b>RAPTOR</b>	<b>Mon 9/23/13</b>	<b>Wed 12/23/14</b>		On track
<b>1.0</b>	<b>Project Management</b>	<b>Mon 9/23/13</b>	<b>Tue 12/23/14</b>	<b>PM</b>	On track
1.1	Create PM Plan	Mon 9/23/13	Tue 10/8/13	PM	Completed on time
1.2	Establish Sandbox access for team	Mon 9/23/13	Tue 10/8/13	SAN	Completed on time
1.3	Identify risks and their mitigations	Mon 9/23/13	Tue 10/8/13	SAN	Completed on time
1.4	Provide Kickoff Meeting Agenda	Thu 10/3/13	Thu 10/3/13	PM	Completed on time
1.5	Kickoff meeting & follow-up	Tue 10/8/13	Tue 10/8/13	SAN & VA	Completed on time
1.6	Update PMP based on Kickoff meeting review	Tue 10/8/13	Fri 10/18/13	SAN & VA	Completed on time
1.7	Provide Kickoff Meeting Minutes	Fri 10/18/13	Fri 10/25/13	PM	Completed on time
1.8	Identify needed resources	Mon 9/23/13	Tue 12/23/14	SAN	Completed on time
1.9	Maintain Project Management Plan	Tue 10/8/13	Tue 12/23/14	PM	On track
<b>2.0</b>	<b>Bimonthly Progress Reports</b>	<b>Mon 9/23/13</b>	<b>Tue 12/23/14</b>	<b>PM</b>	<b>On track</b>
2.1	Bimonthly Progress Report #1	Mon 9/23/13	Mon 10/7/13	PM	Completed on time
2.2	Bimonthly Progress Report #2	Mon 10/7/13	Wed 10/23/13	PM	Completed on time
2.3	Bimonthly Progress Report #3	Wed 10/23/13	Thu 11/7/13	PM	Completed on time
2.4	Bimonthly Progress Report #4	Thu 11/7/13	Sat 11/23/13	PM	Completed on time
2.5	Bimonthly Progress Report #5	Sat 11/23/13	Sat 12/7/13	PM	Completed on time
2.6	Bimonthly Progress Report #6	Sat 12/7/13	Sat 12/21/13	PM	Completed on time
2.7	Bimonthly Progress Report #7	Tue 1/7/14	Tue 1/7/14	PM	Completed on time
2.8	Bimonthly Progress	Tue 1/7/14	Thu 1/23/14	PM	Completed on

#	Task Name	Start	Finish	Resource Names	Status
	Report #8				time
2.9	Bimonthly Progress Report #9	Thu 1/23/14	Fri 2/7/14	PM	Completed on time
2.20	Bimonthly Progress Report #10	Fri 2/7/14	Sun 2/23/14	PM	Completed on time
2.11	Bimonthly Progress Report #11	Sun 2/23/14	Fri 3/7/14	PM	Completed on time
2.12	Bimonthly Progress Report #12	Fri 3/7/14	Sun 3/23/14	PM	Completed on time
2.13	Bimonthly Progress Report #13	Mon 3/24/14	Mon 4/7/14	PM	
2.14	Bimonthly Progress Report #14	Mon 4/7/14	Wed 4/23/14	PM	
2.15	Bimonthly Progress Report #15	Wed 4/23/14	Wed 5/7/14	PM	
2.16	Bimonthly Progress Report #16	Wed 5/7/14	Fri 5/23/14	PM	
2.17	Bimonthly Progress Report #17	Fri 5/23/14	Sat 6/7/14	PM	
2.18	Bimonthly Progress Report #18	Mon 6/9/14	Mon 6/23/14	PM	
2.19	Bimonthly Progress Report #19	Mon 6/23/14	Mon 7/7/14	PM	
2.20	Bimonthly Progress Report #20	Mon 7/7/14	Wed 7/23/14	PM	
2.21	Bimonthly Progress Report #21	Wed 7/23/14	Thu 8/7/14	PM	
2.22	Bimonthly Progress Report #22	Thu 8/7/14	Sat 8/23/14	PM	
2.23	Bimonthly Progress Report #23	Sat 8/23/14	Sun 9/7/14	PM	
2.24	Bimonthly Progress Report #24	Sun 9/7/14	Tue 9/23/14	PM	
2.25	Bimonthly Progress Report #25	Tue 9/23/14	Tue 10/7/14	PM	
2.26	Bimonthly Progress Report #26	Tue 10/7/14	Thu 10/23/14	PM	
2.27	Bimonthly Progress Report #27	Thu 10/23/14	Fri 11/7/14	PM	
2.28	Bimonthly Progress Report #28	Fri 11/7/14	Sun 11/23/14	PM	
2.29	Bimonthly Progress	Sun 11/23/14	Sun 12/7/14	PM	

#	Task Name	Start	Finish	Resource Names	Status
	Report #29				
2.30	Bimonthly Progress Report #30	Mon 12/8/14	Tue 12/23/14	PM	
<b>3.0</b>	<b>Fully documented Software Coding for each Increment</b>	<b>Mon 9/23/13</b>	<b>Tue 12/23/14</b>	<b>Development team</b>	On track
	First Increment Style Sheets	9/23/2013	Mon 12/23/13	Development team	Completed on time
	Second Increment Enhanced Style Sheets and HTML	12/23/2013	Sun 3/23/14	Development team	Completed on time
	Third Increment Enhanced Style Sheets, PHP and HTML	3/23/2014	Mon 6/23/14	Development team	
	Fourth Increment Enhanced Style Sheets, DB schema, PHP and HTML	6/23/2014	Tue 9/23/14	Development team	
	Fifth Increment Code Enhanced Style Sheets, DB schema, PHP and HTML	9/23/2014	Tue 12/23/14	Development team	
<b>4.0</b>	<b>Product Build Upon Completion</b>	<b>Mon 9/23/13</b>	<b>Tue 12/23/14</b>	<b>Development team</b>	On track
4.1	Identify sandbox development tools	9/23/2013	12/23/2013	Development team	Completed on time
4.2	Prepare sandbox development environment	9/23/2013	12/23/2013	Development team	Completed on time
4.3	Prepare initial UI mockup for review	9/23/2013	12/15/2013	Development team	Completed on time
4.4	Initial UI mockup for review & feedback	12/15/2013	12/23/2013	Development team	Completed on time
4.5	Repeat 4.1 to 4.4 for Second Increment	12/23/2013	3/23/2014	Development team	On track
4.6	Repeat 4.1 to 4.4 for Third Increment	3/24/2014	6/23/2014	Development team	
4.7	Repeat 4.1 to 4.4 for Fourth Increment	6/24/2014	9/23/2014	Development team	
4.8	Repeat 4.1 to 4.4 for Fifth Increment	9/24/2014	12/23/2014	Development team	

#	Task Name	Start	Finish	Resource Names	Status
<b>5.0</b>	<b>Software Code Generation Documentation</b>	<b>Mon 9/23/13</b>	<b>Tue 12/23/14</b>	<b>Development team</b>	On track
5.1	Prepare initial draft for review	9/23/2013	12/13/2013	Development team	Completed on time
5.2	Submit UI draft review & obtain feedback	12/13/2013	12/23/2013	VA	Completed on time
5.3	Software Code Plans for Increment One	12/23/2013	12/23/2013	Development team	Completed on time
5.4	Repeat 5.1 to 5.3 for Second Increment	12/23/2013	3/23/2014	SAN, VA	Completed on time
5.5	Repeat 5.1 to 5.3 for Third Increment	3/23/2014	6/23/2014	SAN, VA	
5.6	Repeat 5.1 to 5.3 for Fourth Increment	6/23/2014	9/23/2014	SAN, VA	
5.7	Repeat 5.1 to 5.3 for Fifth Increment	9/23/2014	12/23/2014	SAN, VA	
<b>6.0</b>	<b>Product Sandbox Demonstration</b>	<b>Mon 9/23/13</b>	<b>Tue 12/23/14</b>	<b>Development team</b>	On track
6.1	Walkthrough of RAPTOR test data after completion of increment one for the VA product owner(s)	12/23/2013	1/7/2014	Development team	Completed on time
6.2	User feedback of current sandbox for the VA product owner(s)	12/23/2013	1/7/2014	VA	Completed on time
6.3	Demonstration of RAPTOR after completion of increment three for the VA product owner(s)	3/23/2014	3/30/2014	Development team	Scheduled demonstration for 3/24
6.4	Demonstration of RAPTOR after completion of increment four for the VA product owner(s)	6/23/2014	6/30/2014	SAN,VA	
6.5	Demonstration of feature complete RAPTOR after completion of increment four for the VA product owner(s)	9/23/2014	9/30/2014	Development team	
<b>7</b>	<b>UAT plan</b>	<b>Mon 9/23/13</b>	<b>Tue</b>	<b>Test</b>	On track

#	Task Name	Start	Finish	Resource Names	Status
			<b>12/23/14</b>		
7.1	Participate in UAT planning	Mon 9/23/13	Tue 12/23/14	Test	On track
7.2	Prepare UAT data in sandbox	Mon 9/23/13	Fri 12/13/13	Test	Completed on time
7.3	Submit draft review & obtain feedback	Fri 11/13/13	Mon 12/23/13	VA	Completed on time
7.4	UAT Test Review for Increment One	Mon 12/23/13	Mon 12/23/13	Test	Completed on time
7.5	Repeat 7.1 to 7.3 for Second Increment	Mon 12/23/13	Sun 3/23/14	Test	Completed on time
7.6	Repeat 7.1 to 7.3 for Third Increment	Mon 3/24/14	Mon 6/23/14	Test	
7.7	Repeat 7.1 to 7.3 for Fourth Increment	Mon 6/23/14	Tue 9/23/14	Test	
7.8	Repeat 7.1 to 7.3 for Fifth Increment	Tue 9/23/14	Tue 12/23/14	Test	
<b>8</b>	<b>UAT Test Cases</b>	<b>Mon 9/23/13</b>	<b>Mon 12/23/14</b>	<b>Test</b>	<b>On Track</b>
8.1	Create UAT data	Mon 9/23/13	Fri 12/13/13	Test	Completed on time
8.2	Submit draft review & obtain feedback	Wed 12/18/13	Mon 12/23/13	Test, VA	Completed on time
8.3	UAT Test Data complete in support of sandbox testing	Mon 12/23/13	Mon 12/23/13	Test	Completed on time
8.4	Repeat 8.1 to 8.3 for Second Increment	Mon 12/23/13	Sun 3/23/14	Test	Completed on time
8.5	Repeat 8.1 to 8.3 for Third Increment	Mon 3/24/14	Mon 6/23/14	Test	
8.6	Repeat 8.1 to 8.3 for Fourth Increment	Mon 6/23/14	Tue 9/23/14	Test	
8.7	Repeat 8.1 to 8.3 for Fifth Increment	Tue 9/23/14	Tue 12/23/14	Test	
<b>10</b>	<b>UAT Testing</b>	<b>Mon 9/23/13</b>	<b>Tue 12/23/14</b>	<b>PM, Test, VA</b>	<b>On Track</b>
10.1	Oversee the review of test data and documenting the issues found	Mon 9/23/13	Fri 12/13/13	Test	Completed on time
10.2	Submit UAT data & validate	Fri 12/13/13	Mon 12/23/14	Test	Completed on time
10.3	Final UAT for	Mon 12/23/14	Mon	Test	Completed on

#	Task Name	Start	Finish	Resource Names	Status
	Increment One		12/23/14		time
10.4	Repeat 10.1 to 10.3 for Second Increment	Mon 12/23/13	Sun 3/23/14	Test	On track
10.5	Repeat 10.1 to 10.3 for Third Increment	Mon 3/24/14	Mon 6/23/14	Test	
10.6	Repeat 10.1 to 10.3 for Fourth Increment	Mon 6/23/14	Tue 9/23/14	Test	
10.7	Repeat 10.1 to 10.3 for Fifth Increment	Tue 9/23/14	Tue 12/23/14	Test	
10.8	Test communications in production	Tue 9/23/14	Tue 12/23/14	Test	
10.9	Successfully complete UAT in production	Mon 12/1/14	Tue 12/23/14	Test, VA	
<b>11</b>	<b>UAT Test Report</b>	<b>Tue 9/23/14</b>	<b>Tue 12/23/14</b>	<b>Test</b>	
11.1	Prepare Close-Out Meeting Minutes	Mon 9/23/14	Sat 12/13/14	Test	
11.2	Submit Project Summary and Production Integration/Transition Report	Fri 12/13/14	Tue 12/23/14	Test	
11.3	Gather all testing results to include any issues found	Tue 9/23/14	Tue 12/23/14	Test	
<b>9</b>	<b>RAPTOR Equipment</b>	<b>Mon 9/23/13</b>	<b>Tue 12/23/14</b>	<b>HW</b>	
9.1	Purchase Equipment	Mon 9/23/13	9/23/2014	HW	On track
9.2	Finalize operating system selection and database selection	Tue 10/15/13	11/30/2013	HW	Completed on time
9.3	Obtain Warranties and Licenses for RAPTOR Equipment	Tue 5/23/14	12/23/2014	HW	
9.4	Deliver Equipment	Tue 8/23/14	10/23/2014	HW	
9.5	Identify Production RAPTOR Prototype requirements and application validation	Mon 9/23/13	9/23/2014	HW	On track
9.6	Assist the VA PM to ensure compliance with VA security guidelines and VA Region 1	Mon 9/23/13	9/23/2014	SAN, VA	On track

#	Task Name	Start	Finish	Resource Names	Status
	Sacramento Data Center Application requirements				
9.7	Configure servers in accordance with VA OIT Region 1 Sacramento Data Center server requirements	Tue 9/23/14	12/23/2014	SAN HW	
<b>12</b>	<b>Technical Inputs for Authority to Operate (ATO) Documentation</b>	<b>Tue 9/23/14</b>	<b>Tue 12/23/14</b>	<b>Development team</b>	
12.1	Prepare initial draft for review	Mon 9/23/14	Tue 9/23/14	Development team	
12.2	Submit draft review & obtain feedback	Tue 9/23/14	Tue 12/23/14	Development team	
12.3	Final Technical Inputs for Authority to Operate (ATO) Documentation	Tue 9/23/14	Tue 12/23/14	Development team	
<b>13</b>	<b>Pilot Assessment Report and Presentation</b>	<b>Tue 9/23/14</b>	<b>Tue 12/23/14</b>	<b>Development team</b>	
13.1	Prepare Close-Out Meeting Minutes	Mon 9/23/14	Sun 11/23/14	Development team	
13.2	Submit Project Summary and Production Integration/Transition Report	Tue 9/23/14	Tue 12/23/14	Development team	
<b>14</b>	<b>OSEHRA transition</b>	<b>Mon 9/23/14</b>	<b>Mon 12/23/14</b>	<b>Development team</b>	
14.1	Prepare OSEHRA Checklist and Project Abstract (plus source code and developer documentation if not previously submitted)	Mon 9/23/14	Tue 9/23/14	Development team	
14.2	Submission of Final Deliverables to OSEHRA- OSEHRA project web-link (submission webpage for record)	Tue 9/23/14	Tue 12/23/14	Development team	

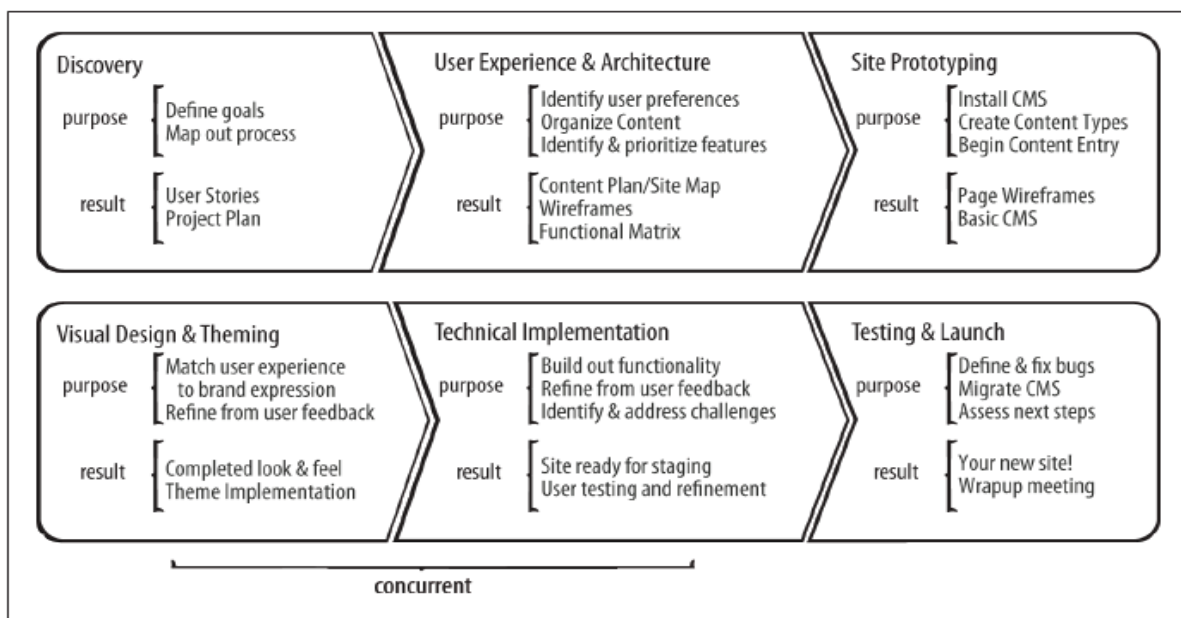
## 2 Project Management Approach

SAN shall provide all necessary equipment and services, other than VA designated support, such as SME and sandbox support, to complete the deliverables and accomplish the tasks described in the PWS. An iterative project plan is a high level view on how the project will be managed to successfully satisfy the CLINs tasks. This document will drive the project to deliver valuable working software in short iterations to the customers.

- Support the design, development and unit testing of the RAPTOR prototype described above
- Provide prototype requirements and application validation assistance

SAN's approach is based on *Designing and Prototyping in Drupal*, by Dani Nordin, 2012. As shown in the figure below, Phase 1 of the Project was the Discovery, User Experience & Architecture, and Site Prototyping. This resulted in the RAPTOR Proof of Concept. Phase 2 builds on the theme and visual design, technical functionality and testing.

**Figure 4 Approach of project from *Designing and Prototyping in Drupal*, D. Nordin, 2012**



### 2.1 Stakeholders and Resources

Below is a table the stakeholders and project resources and their high level functions of the RAPTOR Project.



**Table 3 Stakeholders & Project Resources**

<b>Stakeholders &amp; Project Resources</b>	<b>Function</b>
VA Medical Experts	Provide expert clinical knowledge, requirements, acceptance to project. Provide timely inspection and feedback to development team.
VA Data Center	Provide expert IT knowledge to project
VA PM/ Innovations Coordinator	Provide support to project regarding VA requirements
VA COTR	Provide contracting support to project
VA Sandbox Support	Provide sandbox support to project regarding VA. Respond to helpdesk tickets in a timely manner.
Project Manager	Project Management of schedule, milestones, risks and resources
System Architect	All aspects of implementation design
Programmer(s)	Design and development of RAPTOR application
Analyst	Development of the functional requirements and key measures
QA/QC	Development of the QA process and QC test scripts for testing
UI Specialist	Work on all aspects of user interface graphics and layouts
Computer Hardware Specialist	Configure and construct hardware deliverables; installs software

### **3 Methodology and Tools**

This project will be predominantly managed using the “Agile” software development methodology “scrum” where appropriate. Scrum will ensure that user requirements, as they are defined and evolve, are properly incorporated and satisfied in RAPTOR. Scheduling will be primarily accomplished using MS Project. The Project Manager has the overall authority and responsibility for managing and executing this project according to this Project Plan.

#### **3.1 Bimonthly Progress Reports**

The Bimonthly Progress Reports shall cover all work completed during the reporting period and work planned for the subsequent reporting period. The report shall also identify any problems that arose and a description of how the problems were resolved. If problems have not been completely resolved, the report shall provide an explanation.

The report shall monitor performance against the PMP and report any deviations. The SAN PM will keep in communication with the VA accordingly so that issues that arise are transparent to both parties to prevent escalation of outstanding issues.

The PM shall provide the Contracting Officer’s Technical Representative (COTR) with Bimonthly Progress Reports in electronic form in Microsoft Word. The PM will ensure that the report’s data is accurate and consistent.

#### **3.2 Project Change Control Process**

All changes to the WBS will require approval by the VA Innovation Coordinator and if the proposed change impacts any of the milestones, will require the approval of the VA COTR. The PM will formally write up the proposed change, documenting the reason for the change, all resource requirements and impacts, and any risks associated with it.

Additionally, SAN will utilize the Innovations Help Desk to configure and maintain the sandbox configuration. An example of this from Phase 1 is shown in the figure below.

**Figure 5 Snapshot of Sandbox Tickets entered by development team**

Ticket History				
Ticket No.	<input type="text"/>	Status	All <input type="button" value="v"/>	Contains <input type="text"/>
<input type="button" value="Clear"/> <input type="button" value="Search"/>				
No. v	Date	Updated	Status	Request Detail
699	1/22/12	1/25/12	Pending	CPRS Down/No Access to vaphsdb01 to fix: Our development effort is halted as of 7:70ET Sunday and we...
687	1/15/12	1/17/12	Open	Firewall: I'm entering this ticket to document an issue with the sandbox, MDWS, CPRS and Windows fir...
649	1/9/12	1/9/12	Closed	CPRS is Dead: The Cache that the sandbox uses has crashed and we have no means of restarting it. Thi...
648	1/9/12	1/11/12	Closed	Cache 2008 Server MSI Needed: With the help of Mike Stark, we were able to determine that the proble...
633	1/3/12	1/10/12	Closed	Browser Cannot Access Microsoft.com: Although I can access Google all the time, 90% of the time I go...
631	1/1/12	1/3/12	Closed	Need Persistent VM: I need a persistent sandbox VM
630	1/1/12	1/19/12	Resolved	Cache: Cache is not operative on the sandbox. It appears to need a connection. I do not have any inf...
628	1/1/12	1/18/12	Open	Innovations Laptop Locked: When I boot the laptop I get this message: =====...
594	12/13/11	1/19/12	Open	MDWS Source Code: Can you please install MDWS source on the sandbox some place, or if it is there al...
593	12/13/11	12/19/11	Cancelled	Connection Dropped. Cannot Reconnect: While using the sandbox, the connection closed unexpectedly an...
590	12/13/11	12/13/11	Closed	Sandbox Access: Please create a login for me. Thanks, frank
588	12/13/11	12/14/11	Closed	Connection Failed: I registered successfully here, downloaded the VMWare View 5, used vm.vainnovatio...

### 3.3 Quality Management Approach

This project targets delivery of a platform comprising several software components that must be subjected to rigorous testing for milestone completion.

Each hardware and software component of the platform being developed will be subject to formalized testing before acceptance. Defects and bugs identified during testing will be tracked, where progress to resolution can be measured and reported in a collaborative manner.

- SME involvement in sprint planning
- Appropriate level of technical planning and architectural oversight
- Development progress visible in shared sandbox
- Periodic sprint touch points to ensure project is on track
- Developer unit tests created for critical components of the software
- Burn in testing of the hardware prior to delivery to data center

The Innovation configuration management will be maintained with support of the Innovations Help Desk.

### 3.4 Risk Management Approach

SAN's approach to manage risks for this project includes a methodical communications process by which the project team will identify, and categorize the various risks. The Options Analysis paper will document mitigation strategies.

A risk mitigation log will be maintained and updated throughout the project. The project team members have identified and documented all of the assumptions made during the project planning process, and then on a one by one basis, identify the risks that exist as a result of each assumption to the project based on the potential inaccuracies or inconsistencies that the assumption may exhibit.

A current log of risks and mitigations, as presently understood is provided in Appendix B. Risks are categorized by:

- Type: Logistical – risk from resource availability, Technical – development issues
- Schedule Impact – low, medium, high impact on schedule

### 3.5 Performance Measures

SAN shall monitor performance against the established schedule, milestones, risks and resource support outlined in the approved PMP. SAN shall report any deviations in the Bimonthly Progress Report. As a minimum, the following metrics shall be included:

**Table 4 Performance Standard & Measures**

Required Deliverables	Performance Standard	Acceptable level	Surveillance Methods
Contractor Project Management Plan	Work completed in established timeframe; PMP shall include both narrative and graphic format to display schedule, milestones, risks and resource support. Government acceptance of PMP. The PMP is an active document, a “snapshot in time” and maintained throughout the project.	95%	100% Inspection
Kick-off Agenda And Technical Kickoff Meeting	The project kick-off meeting details the intended approach, work plan, and project schedule for each effort. The	95%	100% Inspection

Required Deliverables	Performance Standard	Acceptable level	Surveillance Methods
Minutes	Contractor shall provide possible dates for VA approval.		
Bimonthly Progress Reports	Bimonthly Progress Reports will provide detailed information about the work completed during the reporting period. Government acceptance of bi-Bimonthly reports.	95%	100% Inspection
Fully documented Software Coding for each Increment	Each increment is available for government inspection and testing. The code will be fully documented so that the code's functional intent can be understood.	95%	100% Inspection
Product Build Upon Completion	Each software increment's files will be uploaded into the government controlled environment (both sandbox and production). An additional copy can be provided at a government detailed designation (such as the Innovations Dropbox).	95%	100% Inspection
Software Code Generation Documentation	SAN will deliver user test case development, requirements verification, management, package technical design, development, test, product delivery and documentation. The documentation will be posted onto the VA Innovations wiki website.	95%	100% Inspection
UAT Test Cases and UAT Test Procedures	Test Cases will be developed in a step-by-step procedure to allow them to be understood by non-technical personnel. Each test case will be representative of realistic (radiologist/ordering provider) user scenarios which will validate each enhancement under test.	95%	100% Inspection
Pilot Location Interfaces	SAN will develop working interfaces between the Production RAPTOR Prototype and each of the five VA Pilot locations (Puget Sound, Palo	95%	100% Inspection

Required Deliverables	Performance Standard	Acceptable level	Surveillance Methods
	Alto, Fresno, Tucson, and the Sacramento Data Center) prior to the start of the actual UAT testing.		
RAPTOR Equipment (RAPTOR Sandbox and Production) and Warranties and Licenses for RAPTOR Equipment	SAN will provide hardware, software, warranty and licensing agreements to include all applicable system and client upgrades and updates as well as technical and hardware support. Government acceptance of deliverables.	95%	100% Inspection
User Acceptance Test Plan (UTAP)	The UATP will outline the UAT strategy to include the key focus areas, entry and exit criteria. The UATP shall including: Test Approach; Assumptions and Constraints; Setup of Test Environment to include validation of interfaces; Approach taken to develop Test Cases; Test Cases/Procedures; Test Period; Test Resource required at each pilot location; and, Process to Document Test Results.	95%	100% Inspection
UAT Test Report	SAN will gather all testing results to include any issues found, such as bugs, crashes, or missing functionality from each pilot location and document these findings in the UAT Test Report.	95%	100% Inspection
Close-Out Meeting Minutes Project Summary and Production Integration/Transition Report OSEHRA Checklist and Project Abstract (plus source code and developer documentation if	SAN will provide a re-cap of the project, list out all executed deliverables, and provide a summary of the progress in relation to the original project plan. SAN will provide lessons learned for the 5 pilot locations for transition of the prototype solution into the VA production environment. SAN will provide a Project Summary and Production Integration/Transition Report detailing the topics described	95%	100% Inspection

Required Deliverables	Performance Standard	Acceptable level	Surveillance Methods
not previously submitted) Submission of Final Deliverables to OSEHRA- OSEHRA project web-link (submission webpage for record)	above.		

## A1.0 Risk Log

### **Risk #1: Innovation Sandbox**

**Type:** Project functionality **Impact:** Schedule

**Issue:** The existing sandbox (cloud1) is non-optimal.

**Mitigation:** UI Development outside of the sandbox. Continue monitoring Innovations support for UAT. Request all access. Now migrating from cloud1 to cloud2 environment.

**Impact:** High impact to UAT and development

### **Risk #2: Timely feedback**

**Type:** Project functionality **Impact:** Schedule

**Issue:** Gaining timely functional feedback on project deliverables may be a challenge due to clinical priorities. Gaining timely technical feedback is critical for architecture.

**Mitigation:** Assist and support Innovator and UAT sites with flexible after hours meetings, timely deliverables. The project team will collaborate with additional stakeholders. This will resulted in additional requirements and a flexible configuration

**strategy. Lack of administrative support has resulted in outstanding action items not being addressed by users.**

**Impact: Medium to development and UAT**

### **Risk #3: MS OS and database**

**Type: Project technology    Impact: Schedule**

**Issue: The PWS specifies Microsoft OS and database (MS SQL Server 2008). The development team initially recommended change to PWS to use an updated OS such as the open source LAMP stack instead.**

**Mitigation: Discussions with Region production coordinator on technology choices has resulted in redesign. We are moving forward with a MS SQL Server 2008 database. The risk is that the virtual and physical configurations may be out of synch.**

**Impact: Medium to architecture regarding technical platform**

### **Risk #4: DICOM Images & Viewer Integration**

**Type: Project technology    Impact: Schedule**

**Issue: No obvious choice between commercial and open source DICOM image viewer is currently available.**

**Mitigation: We evaluated multiple options during design phase to determine most beneficial route to an integrated solution. We are moving forward with an embedded HTML5 viewer. We are designing to include VIX and CVIX web services for image integration.**

**Impact: Low to architecture regarding technical platform**

### **Risk #5: Data Storage**



**Type: Architecture    Impact: Performance and Schedule**

**Issue:**    PWS has requirements that may benefit from storing updates back into Vista accessible data storage.

**Mitigation:**    Engineer local storage solution alternative if write back to Vista accessible storage is not practical within project time frame.    We have requested a meeting on additional enhancements that include data storage write back.

**Impact: High to architecture and UAT**

#### **Risk #6: Radiation Dose Reporting**

**Type: Project technology    Impact: Performance and Schedule**

**Issue:**    Capturing radiation dosage directly from modality is preferred but may be impacted by lack of connectivity or API.

**Mitigation:**    Provide alternate data entry mechanisms for radiation dosage.    This was documented in the enhancements listing.    We have requested a meeting on additional enhancements that includes dose monitoring enhancements.

**Impact: High to architecture and UAT**

#### **Risk #7: Contraindication Maintenance**

**Type: Application Maintenance    Impact: Performance and Schedule**

**Issue:**    Contraindication factors evolve as knowledge, tools, and medications change; contraindication rules may become out of date if not maintained.

**Mitigation:**    Train site administrators on contraindication maintenance

**Impact: Low**

**Risk #8: Innovation Project Management**

**Type:** All aspects of project   **Impact:** Performance and Schedule

**Issue:** Throughout the project, there has been a lack of communications and leadership by VA Innovations Project Management in providing guidance, approving invoices, provide timely feedback and support, and responding to the project risks. This has jeopardized the project.

**Mitigation:** Involve contracting and senior management

**Impact:** High

**Risk #9: Production Configuration of VA Software**

**Type:** Architecture   **Impact:** Performance and Schedule

**Issue:** Lack of production support and knowledge of MDWS, and CVIX. Closest MDWS and CVIX installations are reportedly thousands of miles away from Sacramento CA. We have been coordinating with VA on obtaining recent patches and installers to avoid duplication of effort and keep good configuration management.

**Mitigation:** Involve production support, contracting and senior management.

**Impact:** High to schedule

**Risk #10: Loss of Palo Alto as a UAT site**

**Type:** Schedule Impact

**Issue:** Palo Alto, CA (the largest UAT site), has dropped out of the project. Losing the largest site puts pressure on the entire project management staff to find an alternative. The previous 4 months of meetings, action items, etc. has to be repeated to “get-up-to speed” alternative site(s). The loss of the largest site has jeopardized the project. The request for additional resources to “get-up-to speed” alternative site(s) was turned down and contracts sent a “no cost” mod.

**Mitigation:** By turning down the request for additional funding, the VA has assumed all

responsibility to get new site “up to speed”.

**Impact: Med**

**Risk #11: Request of VistA Imaging MAG\*3.0\*138 (VistA Imaging eXchange)**

**Type: Schedule Impact**

**Issue:** There are two options for the VA VIX code:

**1) VA provides Patch 138 VIX and CVIX source code and installers. Patch 138 has been field tested but the VA has pushed back on providing this unreleased code.**

**2) VA provides Patch 119 VIX and CVIX source code and installers. Patch 119 is released and the source code should already be on the FOIA site (it is not there as of 3/7/14). The installers are not typically part of the FOIA release but since this is a VA project they should be able to provide us with the installers which would be very beneficial.**

**We would like to use the VIX/CVIX installers to prepare the environment for the Raptor VIX so it is very important that we get the installers.**

**Mitigation:** The points of contact we suggest talking to are:

**Linville, Kathleen (Kathleen.Linville@va.gov)**

**Devlin, Vitalia M. (vitalia.devlin@va.gov)**

**Carlson, Larry E. (Larry.Carlson2@va.gov)**

**Impact: Med**