

DAVID Y. IGE
GOVERNOR



DOUGLAS MURDOCK
CHIEF INFORMATION
OFFICER

OFFICE OF ENTERPRISE TECHNOLOGY SERVICES

P.O. BOX 119, HONOLULU, HAWAII 96810-0119
Ph: (808) 586-6000 | Fax: (808) 586-1922
ETS.HAWAII.GOV

March 12, 2020

The Honorable Ronald D. Kouchi,
President, and
Members of The Senate
Twenty-Ninth State Legislature
Hawaii State Capitol, Room 409
Honolulu, Hawaii 96813

The Honorable Scott K. Saiki,
Speaker, and
Members of The House of Representatives
Twenty-Ninth State Legislature
Hawaii State Capitol, Room 431
Honolulu, Hawaii 96813

Dear President Kouchi, Speaker Saiki, and Members of the Legislature:

Pursuant to HRS section 27-43.6, which requires the Chief Information Officer to submit applicable independent verification and validation (IV&V) reports to the Legislature within ten days of receiving the report, please find attached the report the Office of Enterprise Technology Services received for the State of Hawaii Department of Health Hawaii BHA Integrated Case Management System Project.

In accordance with HRS section 93-16, this report may be viewed electronically at <http://ets.hawaii.gov> (see "Reports").

Sincerely,


Douglas Murdock (Mar 12, 2020)

DOUGLAS MURDOCK
Chief Information Officer
State of Hawai'i

Attachment (2)



Hawaii BHA Integrated Case Management System Project – *Phase 3*

*FINAL IV&V Report for the period of
January 1 - January 31, 2020*

Final submitted: February 14, 2020

Agenda

Executive Summary

IV&V Findings & Recommendations

Appendices

- A – Rating Scales
- B – Inputs
- C – Project Trends







Executive Summary

In January, the project pushed Release 3.4 into production. Although the release generally performed as expected, some defects were identified, and a mid-sprint release was required. IV&V learned that the project is experiencing resource constraints on the state and vendor sides. Some of these constraints are the result of staffing limitations while others could be alleviated by improved processes. BHA is aware of and actively working to address the constraints, which includes pursuing additional advisory support from experienced RSM resources.

The project continues to mature its agile practice and address current insufficiencies regarding Definition of Done, Product Roadmap, and product backlog grooming. Addressing these items will help with Sprint and Release Planning as well as some of the resource bandwidth issues the project is experiencing.

IV&V learned that the project is not fully conducting regression testing at this time, which is likely contributing to defects and deprecated functionality that has been identified in three of the four Phase 3 releases to date. The project is actively exploring options to address and resolve this issue, including the potential for implementing automated regression testing through AzureDevOps.

-	Dec	Jan	Category	IV&V Observations
-			Sprint Planning	IV&V has escalated the Sprint Planning category to a Yellow (medium) rating for the January reporting period. In January, potential resource constraints on both the State and Vendor side were investigated by IV&V. Some project roles are currently understaffed, and/or are occupied by staff with limited bandwidth. These constraints are creating workflow issues, requiring resource reassignments, and impacting the project's ability to configure and develop User Stories planned for a release. BHA began taking steps to address resource bandwidth constraints in January and is planning on increasing RSM's involvement in February.
-			User Story (US) Validation	IV&V continues to rate the User Story (US) Validation category at Green (low) for the January reporting period and has no active findings in this category. IV&V continues to work with the project to understand the US development and validation process.

Executive Summary

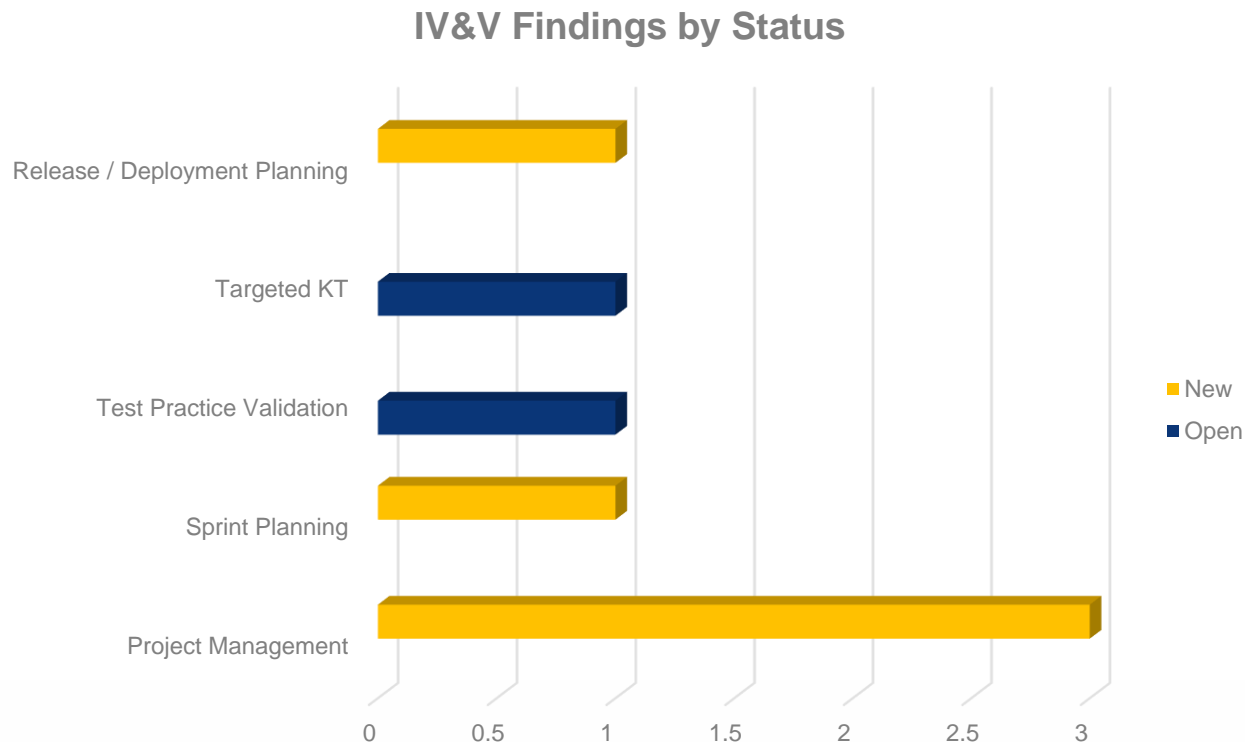
-	Dec	Jan	Category	IV&V Observations
-	G	Y	Test Practice Validation	IV&V has escalated the Test Practice Validation category to a Yellow (medium) rating. During this period, IV&V learned that regression testing is not being fully executed by the project. It is IV&V's understanding that full end-to-end regression testing for a release has not occurred since the end of Phase 2.1. As "broken" and/or deprecated functionality has occurred in three of the four Phase 3 releases to date, it is recommended that the project take immediate action to implement regression testing practices. BHA is exploring options for remediating this issue, including the potential development of automated regression testing scripts in Azure DevOps, and a schedule for partial regression testing.
-	G	G	Release / Deployment Planning	IV&V continues to rate the User Story (US) Validation category at Green (low) for the January reporting period. IV&V opened a preliminary concern regarding the project's deployment preparation and activities, as it is not clear if a deployment "script" or updated deployment notes are being followed by the project to help control and make consistent deployment activities. It is anticipated that RSM will advise on this topic in February.
-	G	G	OJT and KT Sessions	IV&V continues to rate the OJT and KT Sessions category at Green (low) for the January reporting period and has no active findings in this category. IV&V continues to work to understand the project's training and KT efforts and activities but has no material observations for January.
-	G	G	Targeted KT	IV&V continues to rate the Targeted KT category at Green (low) for the January reporting period. The project continues to have focused sessions on the Calculator 3.0 tool. KT sessions are planned to continue as the Vue.JS framework represents a new challenge for BHA, both in terms of the configuration and development of the code, and the need for establishing ongoing and reliable support.
-	G	G	Project Performance Metrics	IV&V continues to rate the Project Performance Metrics category at Green (low) for the January reporting period. The project continues to exceed velocity expectations. However, due to a lack of a Definition of Done and a fully defined Product Roadmap, it is not clear if current velocity is commensurate to hit the project's Phase 3 goals. The project is and continues to work collaboratively to define "done" and refine the Product Roadmap in order to more confidently drive towards the Phase 3 goals.

Executive Summary

-	Dec	Jan	Category	IV&V Observations
-	G	G	Organizational Maturity Assessment	IV&V continues to rate the Organization Maturity Assessment at Green (low) for the January reporting period. The project team completed the first Agile Maturity Assessment to establish a baseline and identify areas for growth. The collaboration between the BHA Team was good during the assessment. Over time, additional categories will likely be added to the assessment, and IV&V's approach to guiding the project through the assessment will adapt to the changes and needs of BHA. IV&V is confident that BHA understands the value of the assessment, is focusing on the right aspects of organizational maturity, and is building an understanding of how to position themselves to achieve desired maturity levels.
-	-	G	Project Management	IV&V is re-introducing this category in the January 2020 reporting period to provide an opportunity to identify opportunities to help the project control scope, manage resources, prioritize enhancements and defects vs planned US', understand true project productivity/performance metrics, and other project management-related issues. IV&V rates the Project Management category at Green (low) for the January reporting period. We are tracking the project's progress on grooming the product backlog, documenting a Definition of Done, and further refining a Product Roadmap.

Executive Summary

As of the January 2020 reporting period, IV&V has five (5) open preliminary concerns, one High Issue, and one Low Risk spread across the Sprint Planning, Release / Deployment Planning, Test Practice Validation, Targeted Knowledge Transfer, and Project Management assessment areas.



The background is a solid blue color. It features several abstract geometric shapes, including squares and rectangles, some of which are outlined in a lighter blue and others are solid. These shapes are scattered across the page, with a higher concentration in the upper left and lower right areas.

IV&V Findings & Recommendations

IV&V Findings & Recommendations

Assessment Categories

Throughout this project, IV&V will verify and validate activities performed in the following process areas:

- Sprint Planning
- User Story Validation
- Test Practice Validation
- Release / Deployment Planning
- On-the-Job Training (OJT) and Knowledge Transfer (KT) Sessions
- Targeted Knowledge Transfer (KT)
- Project Management
- Project Performance Metrics
- Organizational Maturity Assessment

IV&V Findings & Recommendations

Sprint Planning

#	Key Findings	Criticality Rating
1	Closed Preliminary Concern – Detailed investigation into the project's sprint planning processes and adoption of generally accepted agile best practices. IV&V is closing this concern and will be tracking items related to Definition of Done, roadmap, resourcing, and backlog grooming in new, separate findings.	Closed

Recommendations	Status
<ul style="list-style-type: none">As much as possible, the project should identify what feature enhancements will be targeted for each Release and should clearly map out the roadmap out through the last Phase 3 release in September 2020.	Closed
<ul style="list-style-type: none">The project should clearly define “Done” to ensure the project team is working towards the same goal and increase opportunities for success. Having a clear “Definition of Done” will help provide the project with guidance on how to stay within scope.	Closed

IV&V Findings & Recommendations

Sprint Planning

#	Key Findings	Criticality Rating
8	<p>New Low Risk – The BHA Technical Team bandwidth may not be sufficient to meet the needs of the project, which could compromise project productivity. The BHA Technical Team plays a role that is critical to project success. Currently, the responsibilities associated with the BHA Technical Team have expanded beyond their collective available bandwidth. IV&V notes that BHA began addressing this bandwidth issue, which includes increased collaboration with key RSM resources, and are working to potentially change the structure of the Technical Team.</p> <p>The BHA Technical Team leads the efforts of all technical DOH staff on the project. As such, the Team's time is both extremely valuable and scarce. If the Team's expected workload exceeds bandwidth, the project could experience bottlenecks. Optimization of the BHA Technical Team's time is to the benefit of the project and plays a critical role in the project's ability to hit performance targets and achieve the Phase 3 Definition of Done.</p>	L

Recommendations	Status
<ul style="list-style-type: none"> The Project should investigate mechanisms of increasing the bandwidth of the BHA Technical Team, either by bringing in additional resources through new hires, or through existing vendor contracts. 	In progress
<ul style="list-style-type: none"> The Project should assess, where possible, if there are responsibilities of the BHA Technical Team can be reassigned to other project staff. 	In progress
<ul style="list-style-type: none"> The Project should evaluate where process inefficiencies can be addressed and streamlined to possibly free up the BHA Technical Team's availability. 	In progress


IV&V Findings & Recommendations

User Story Validation

#	Key Findings	Criticality Rating
	As of the January reporting period, there are no findings in this category. IV&V will work with BHA to perform deeper analysis on the project's processes for writing, validating, and planning US development through release and into M&O.	

IV&V Findings & Recommendations

Test Practice Validation

#	Key Findings	Criticality Rating
2	<p>Escalated to High Issue – As a result of regression testing not being consistently performed, production releases are breaking and/or deprecating existing functionality in the production environment. IVV validates that there have been several incidents of defects being introduced into production in three of the four Phase 3 releases to date, as well as in a mid-sprint production push for defect resolution. IVV has also validated that Regression Test scripts have not been fully executed since Phase 2. While most of the defects had negligible effect on production users, the issue related to the Integrated Support Worksheet did have business impact to DDD users, due to the production push missing a business rule. Per CAMHD, the regression test scripts take several days to execute. However since the collaborative testing approach was introduced in Phase 2, the time needed for full regression testing has not been permitted in the sprint schedule. Other contributing factors could be due to the fact that the TEST environment had been behind on patches (which was addressed during January 2020). IVV notes the regression test scripts are not up to date due to the changes made since Phase 2. While root cause is not yet identified, the project is evaluating several options to ensure this issue does not re-occur. IV&V notes that BHA began investigating the opportunity to implement an automated testing suite and is hopeful that this could become a reality in the coming months.</p>	

IV&V Findings & Recommendations

Test Practice Validation (cont'd)

Recommendations	Status
<ul style="list-style-type: none">• To address regression testing, the Project should continue to pursue and/or consider:<ol style="list-style-type: none">1. Updating the regression test scripts to ensure consistency with system configuration.2. Modifying release schedules to allow for regression testing timeframes3. Grouping releasees by functionality type to avoid unnecessary repetitive work being performed in any given section of the solution.4. Performing regression testing after every release, or possibly every other release, or potentially tying regression tests to full solution upgrade releases. In addition, consider alternating the DDD and CAMHD scripts every other release.5. Modifying regression test scripts to start AFTER case creation, limiting the time it takes to execute.6. Potentially modifying the deployment scripts based on information gained from any or all of the steps listed above.7. Pursuing additional formal training in AzureDevOps for test automation at the earliest possible juncture and commence efforts to automate at least the 2 primary regression test scripts.	New

IV&V Findings & Recommendations

Release / Deployment Planning

#	Key Findings	Criticality Rating
5	<p><i>New Preliminary Concern</i> - Due to the project not following a detailed deployment script, the project may continue to experience defects related to deployment activities. There have been several defects pushed to production with Phase 3 releases. Some of the defects introduced to production have been narrowed down to environmental promotional activities. In these instances, the DEV and TEST environments were not in sync with the production environment (missing business rules, missing components, missing dependencies, etc.). IVV is aware that DOH staff shadowed RSM staff for all deployment releases during Phase 2 with RSM providing instruction and DOH staff physically executing the tasks and activities via keyboard. For Phase 3, it is unclear whether a complete, up to date, and documented deployment script, or deployment notes, are being utilized by BHA for deployment activities.</p> <p>A complete, up to date, and documented deployment script is needed to ensure the repeatability and stability of DOH's production deployments. Since there are currently two deployment types (patches and full solution upgrades), two scripts may be warranted. An embedded process and documented script will help ensure that mistakes are minimized, and that functionality is not mistakenly deprecated when deployments take place.</p>	N/A
Recommendations		Status
<ul style="list-style-type: none"> IVV recommends documenting deployment scripts for both the patch method and the full solution upgrade method. The script(s) should be in the form of a step-by-step procedure that walks through from start to finish of the deployment process and involve several technical staff to ensure staff availability to accomplish these tasks when primary deployment personnel are unavailable. 		New
<ul style="list-style-type: none"> As appropriate, consult with RSM on best practices that BHA could employ to support deployment. 		New

IV&V Findings & Recommendations

On-the-Job Training (OJT) and Knowledge Transfer (KT) Sessions

#	Key Findings	Criticality Rating
	As of the January reporting period, there are no findings in this category. IV&V will continue to work with BHA to identify OJT and KT needs and will attend any planned sessions that are appropriate for IV&V to observe.	

IV&V Findings & Recommendations

Targeted KT

#	Key Findings	Criticality Rating
3	Preliminary Concern – Usage of open source JavaScript framework for development and ongoing maintenance of Calculator 3.0 requires BHA to take a proactive approach to support and security. IVV attended a Knowledge Transfer session on the Calculator 3.0 application in late January. Discussion topics included code review, managing code branches, updating web resources, and known defects. The session was technical in nature and aimed specifically at a developer audience. DOH had three (3) developers in attendance and all in attendance appeared to grasp the concepts presented. The SI indicated that there will need to be 'several' more KT sessions on the Calculator 3.0 application in Vue.JS. It remains unclear at this juncture whether BHA has the capacity (resources, bandwidth, skillsets) to maintain the tool, which will be determined through the execution of the KT sessions.	N/A

Recommendations	Status
<ul style="list-style-type: none">IV&V recommends BHA work to establish a reliable and repeatable process for keeping abreast of communal updates and support opportunities for the Vue.JS framework.	Open
<ul style="list-style-type: none">IV&V recommends BHA continue to hold targeted KT sessions with RSM on maintaining Calculator 3.0 via a suite of tools including Vue.JS, and determine what additional skillsets, training, and/or resources are needed to support BHA's long-term ownership of Calculator 3.0.	In progress

IV&V Findings & Recommendations

Project Management

#	Key Findings	Criticality Rating
6	<p><i>New Preliminary Concern</i> - The project lacks a documented 'Definition of Done', which could challenge the project's ability to fully achieve the goals of Phase 3. BHA does not have a documented 'Definition of Done' (DOD) for the BHA Top 100 User Stories of for Phase 3. Because of this, it is unclear how proposed functionality/features are prioritized for each sprint, and throughout Phase 3.</p> <p>The 'Definition of Done' document guides the Project's vision, business, and technical goals that are important inputs for stakeholders to develop a Roadmap for Phase 3. Without the 'Definition of Done' document, the project is likely to struggle to prioritize proposed functionality/features which may be equally important but are at odds with each other.</p>	N/A

Recommendations	Status
<ul style="list-style-type: none"> Project is currently in the process of creating the Definition of Done. IV&V recommends that the project create this document and socialize this with project team before end of Feb 2020. 	New
<ul style="list-style-type: none"> IV&V recommends that the project consider the items from the prioritized list, available resources and define "Done" as a percentage of the identified priority list with room for flexibility to add any other features/enhancements that will be identified during Phase 3. 	New

IV&V Findings & Recommendations

Project Management

#	Key Findings	Criticality Rating
7	<p><i>New Preliminary Concern</i> - The lack of consistent backlog grooming could result in the project backlog having obsolete, non-estimated, and poorly defined user stories. The backlog of defects, requests, and user stories continues to grow. Currently, there are approximately 429 defects and requests, of which almost 200 have a status of 'New'. IVV notes that a large percentage of the backlogged work items do not have user story points estimated. Many of the items listed in the backlog are old, and some may have had needs or requirements change over time or may now be obsolete. IV&V notes that DDD and CAMHD have initiated this effort and agreed to prioritize grooming the backlog by the end of February. A comprehensive, up-to-date backlog is a primary tenet of agile software development. If a backlog is carrying work items that may not ever be completed for any reason, they should be removed from the backlog to ensure its viability.</p>	N/A

Recommendations	Status
<ul style="list-style-type: none"> CAMHD and DDD should prioritize grooming the backlog to bring it as current and accurate as possible. This should include removing items no longer needed, and ensuring all items are fully defined, readying them for configuration or developer resources. To the extent feasible, BHA should involve RSM SMEs in this process, if only for the interim to get "caught up" on grooming efforts. 	New

IV&V Findings & Recommendations

Project Management

#	Key Findings	Criticality Rating
9	<p><i>New Preliminary Concern</i> - The lack of a Product Roadmap that provides direction on the top product features to be delivered in the near term (next 3 months), midterm, and long term could have an adverse impact on the Project's scope and schedule. BHA does not have a single, definitive Product Roadmap for Phase 3 that addresses the functionalities, features, and / or enhancements to be built in order to fully address BHA's business needs. IV&V met with RSM and BHA on this topic in January, and notes that the project is actively working to address this concern.</p> <p>A Roadmap is a tool that guides an agile project on what functionalities/features are targeted to be built and released and when users can have access to these functionalities. Without a defined Roadmap the project may not be able to effectively scope the top features to be released within Phase 3 and ensure the correct resources are available to accomplish the goal of each sprint and the Phase.</p>	N/A

Recommendations	Status
<ul style="list-style-type: none"> IV&V recommends the Project complete the short-term, mid-term, and long-term Roadmap by the end of February to understand if there are any constraints (resources, budget) that may hinder the project from releasing the needed functionalities/features targeted for Phase 3 as documented in the Definition of Done. 	New

IV&V Findings & Recommendations

Project Performance Metrics

Metric	Description	IV&V Observations	IV&V Updates
Velocity	<ul style="list-style-type: none"> Review and validate the velocity data as reported by the project Verify the project is on pace to hit the total target number of US/USP for Phase 3 	<p>The project pushed Release 3.4 on January 16 with an actual USP count of 84, vs an estimate of 74 USP. The project also had a mid-sprint Release on Jan 29th to address 4 bugs from Release 3.4</p> <p><i>IV&V has raised a concern regarding the availability of BHA resources (#8)</i></p>	<p>January Update – The Project is currently working on further developing the Phase 3 Roadmap which includes estimation and prioritization. As this effort is not yet complete, it is difficult to determine if the project is on target to hit their Phase 3 goals. Additionally, the project is in process of adding tags to features, which will provide even greater insight into velocity.</p>
US Point Estimates vs Actuals	<ul style="list-style-type: none"> Verify the project is tracking US Point estimates and actual data Determine the delta between estimates and actuals Based on the delta (if any) investigate the potential root cause for the delta 	<p>The Project Scrum master closely tracks the USP on a daily basis. IV&V has no concerns regarding this.</p>	<p>January Update – For the tracking of actual time for BHA: 1 US Point = 5 hours of work effort (determined from actuals recorded from Phase 1 and Phase 2) IV&V has reached out to the Project requesting information on actual US points deployed to production in the previous release. Currently, estimates take into account the BHA time for code review, etc., however, the project is not getting the actuals from the BHA team and the PM does not have insight into the number of hours other BHA SME's contribute to the sprint/release. Until this data is available, calculating US Point estimates vs actuals will be incomplete.</p>

IV&V Findings & Recommendations

Project Performance Metrics (cont'd.)

Metric	Description	IV&V Observations	IV&V Updates
Defect Metrics	<ul style="list-style-type: none"> Understand and track the following: <ul style="list-style-type: none"> Defects by category (bug fixes) Average number of defects per release US Points assigned to defects in a release vs US Points assigned to planned US in a release 	Four bugs were created from Release 3.4 that required a mid-sprint release on January 29. IV&V is investigating the root causes for these bugs and if they're directly related to the recent lack of regression testing.	January Update – Starting with Release 3.5 in February, IVV will validate and track project defect metrics. From a process perspective, to ensure time is available to identify defects after any given release, IVV recommends waiting approximately one week after each release, and then meeting with RSM to review any resultant defects that have been discovered by the project team or user groups. IVV will also look to validate the differentiation between defects in a release vs US points in a release. IVV will include this information in the February IVV monthly report.

IV&V Findings & Recommendations

Organizational Maturity Assessment

Measure	IV&V Observations
BHA Resources and Resource Capacity	IV&V observed constraints in BHA resource capacity and bandwidth, based on both the amount of work key resources are responsible for as well as partially due to process inefficiencies. BHA is aware of these bandwidth constraints and is actively working to improve process alongside seeking support from key RSM resources. Please see related IV&V finding #8 (Low Risk) for additional information.
KT / OJT	On-the-job Training (OJT) and Knowledge Transfer (KT) sessions between RSM and BHA continued in January, including Targeted Knowledge Transfer sessions specific to Calculator 3.0. Additionally, the RSM Solution Architect will be ramping up KT sessions in February meeting three days a week with the BHA Technical Team, focusing on increasing the BHA Technical Team's collective knowledge and capabilities specific to solution design, configuration, estimation, and management of the product backlog. BHA is aware of the value of OJT and KT and is actively pursuing learning opportunities with RSM as much as possible. Please see related IV&V finding #3 (Preliminary Concern) for additional information.
Solution Support	BHA and RSM continue to hold and seek additional OJT and KT sessions, focused on both short-term management and long-term ownership of the solution. BHA continues to pursue an Information Technology Service Management (ITSM) tool for ongoing solution support purposes (i.e., ticketing, help desk, error database), but procurement and implementation of the tool is still not likely to occur in the current fiscal year.

IV&V Findings & Recommendations

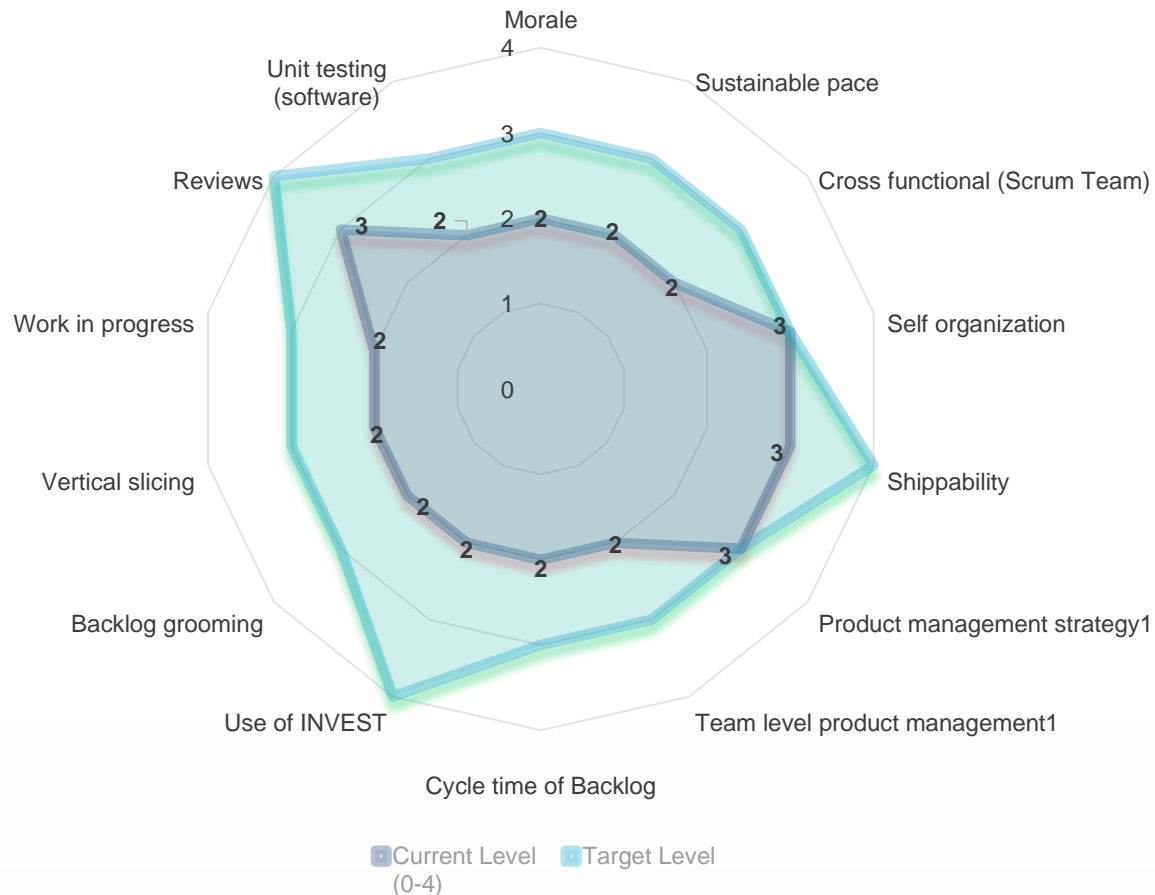
Organizational Maturity Assessment – Agile Maturity

Measure	IV&V Observations
Agile Maturity	<p>Organizations adopting agile practices embark on a journey of doing business in a different way. Agility is built on open communication, trust and teamwork. This journey requires a substantial commitment to new tools, training, techniques and most of all cultural change.</p> <p>Through the first Agile Maturity Assessment, the BHA Team collaborated to determine the relevant measurements and identify the 'as-is/to-be' states. Next, the project will focus on identifying the steps and resources needed to advance its level of agile maturity as it moves ahead.</p> <p>As the project continues to conduct these Agile Maturity Assessments, other measurements may be added to the project's maturity targets, and greater emphasis will be placed on steps to advance maturity. The IV&V team will continue to refine its approach to guiding the project through the assessments, adjusting to the needs and dynamics of the project team.</p>

IV&V Findings & Recommendations

Organizational Maturity Assessment – Agile Maturity

Agile Maturity Matrix Assessment for January 2020



The background is a solid blue color. It is decorated with several abstract geometric shapes, including squares and rectangles of various sizes and shades of blue. Some shapes are solid, while others are outlined. They are scattered across the page, with a higher concentration in the upper left and lower right areas.

Appendix A: IV&V Rating Scales

Appendix A

IV&V Rating Scales

This appendix provides the details of each finding and recommendation identified by IV&V. Project stakeholders are encouraged to review the findings and recommendations log details as needed.

- See Findings and Recommendations Log (provided under separate cover)
- IV&V Assessment Category Rating Definitions

G

The assessment category is under control and the current scope can be delivered within the current schedule.

The assessment category's risks and issues have been identified, and mitigation activities are effective. The overall impact of risk and issues is minimal.

The assessment category is proceeding according to plan (< 30 days late).

Y

The assessment is under control but also actively addressing resource, schedule or scope challenges that have arisen. There is a clear plan to get back on track.

The assessment category's risk and/or issues have been identified, and further mitigation is required to facilitate forward progress. The known impact of potential risks and known issues are likely to jeopardize the assessment category.

Schedule issues are emerging (> 30 days but < 60 days late).

Project Leadership attention is required to ensure the assessment category is under control.

R

The assessment category is not under control as there are serious problems with resources, schedule, or scope. A plan to get back on track is needed.




The assessment category's risks and issues pose significant challenges and require immediate mitigation and/or escalation. The project's ability to complete critical tasks and/or meet the project's objectives is compromised and is preventing the project from progressing forward.

Significant schedule issues exist (> 60 days late). Milestone and task completion dates will need to be re-planned.

Executive management and/or project sponsorship attention is required to bring the assessment category under control.

Appendix A

Criticality Ratings

Criticality Rating	Definition
	A high rating is assigned if there is a possibility of substantial impact to product quality, scope, cost, or schedule. A major disruption is likely, and the consequences would be unacceptable. A different approach is required. Mitigation strategies should be evaluated and acted upon immediately.
	A medium rating is assigned if there is a possibility of moderate impact to product quality, scope, cost, or schedule. Some disruption is likely, and a different approach may be required. Mitigation strategies should be implemented as soon as feasible.
	A low rating is assigned if there is a possibility of slight impact to product quality, scope, cost, or schedule. Minimal disruption is likely, and some oversight is most likely needed to ensure that the risk remains low. Mitigation strategies should be considered for implementation when possible.



Appendix B: Inputs

Appendix B

Inputs

This appendix identifies the artifacts and activities that serve as the basis for the IV&V observations.

Meetings attended during the January 2020 reporting period:

1. Daily Scrum meetings (selected)
2. Twice Weekly RSM Issues Meeting
3. Sprint Planning for Release 3.4
4. Weekly CCB Meeting
5. Weekly BHA-ITS Project Status Meeting
6. Calculator 3.0 Knowledge Transfer
7. Weekly Change Planning for Dev
8. Phase 3 Deployment Planning Meeting
9. Bi-Weekly Check-in: CAMHD
10. Bi-Weekly Check-in: DDD
11. BHA IAPDU planning meeting
12. Regression testing meeting (BHA and DataHouse)
13. Reporting Metrics Discussion

Eclipse IV&V® Base Standards and Checklists



Document

Artifacts reviewed during the January 2020 reporting period:

1. Daily Scrum Notes (selected)
2. Twice Weekly Issues Meeting Notes (selected)
3. Updated Mod 3 and Mod 4 timeline
4. IV&V Statement of Work and Schedule of Deliverables v1.5



Appendix C: Project Trends

Appendix C

Project Trends

Trend: Overall Project Health										
Process Area	2019		2020							
	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Sep
User Story Validation	N/A									
Test Practice Validation	N/A									
Sprint Planning	N/A									
Release / Deployment Planning	N/A									
OJT and KT Sessions	N/A									
Targeted KT	N/A									
Project Performance Metrics	N/A									
Organizational Maturity Metrics	N/A									
General Project Management	N/A	N/A								
Total Open Findings	N/A	3	7							
Issue - high	N/A	0	1							
Issue - medium	N/A	0	0							
Issue - low	N/A	0	0							
Risk - high	N/A	0	0							
Risk - medium	N/A	0	0							
Risk - low	N/A	0	1							
Preliminary Concern	N/A	3	5							



Solutions that Matter

ID	Identified Date	Summary	Observation	Significance	Recommendation	Updates	Process Area	Type	Priority	Status	Closure Reason	Iteration	Risk Owner
2	12/31/19	As a result of regression testing not being consistently performed, production releases are both breaking and deprecating existing functionality in the production environment.	R3.3 introduced a defect that deprecated features in production specific to Integrated Support and Life Trajectory functionality. DDD has informed IV&V that there are other examples of functionality being deprecated after a release, some of which are still being investigated. As of this report, IV&V has not evaluated the project's root cause analysis (RCA) process used to determine why such functionality was deprecated but will discuss further with BHA in January 2020.	Thorough vetting and validation of regression test cases is necessary to prevent both defects and the deprecation of production functionality when a release is pushed live. When defects occur in production, the project should follow a defined and repeatable process for determining the root cause of the problem.	IV&V suggests that business users thoroughly validate all test cases associated with each user story and flag those needing regression testing. Also, to the extent possible, BHA should explore test automation to support regression test efforts.	01/31/2020 - IVV validates that there have been several incidents of defects being introduced into production in three of the four Phase 3 releases to date, as well as in a mid-sprint production push for defect resolution. IVV has also validated that Regression Test scripts have not been fully executed since Phase 2. While most of the defects had negligible effect on production users, the issue related to the Integrated Support Worksheet did have business impact to DDD users, due to the production push missing a business rule. Per CAMHD, the regression test scripts take several days to execute. However since the collaborative testing approach was introduced in Phase 2, the time needed for full regression testing has not been permitted in the sprint schedule. Other contributing factors could be due to the fact that the TEST environment had been behind on patches (which was addressed during January 2020). IVV notes the regression test scripts are not up to date due to the changes made since Phase 2. While root cause is not yet identified, the project is evaluating several options to ensure this issue does not re-occur. IV&V notes that BHA began investigating the opportunity to implement an automated testing suite and is hopeful that this could become a reality in the coming months. To address regression testing, the Project should continue to pursue and/or consider: 1. Updating the regression test scripts to ensure consistency with system configuration. 2. Modifying release schedules to allow for regression testing timeframes 3. Grouping releasees by functionality type to avoid unnecessary repetitive work being performed in any given section of the solution. 4. Performing regression testing after every release, or possibly every other release, or potentially tying regression tests to full solution upgrade releases. In addition, consider alternating the DDD and CAMHD scripts every other release. 5. Modifying regression test scripts to start AFTER case creation, limiting the time it takes to execute.	Test Practice Validation	Issue	High	Open		General	D Macdonald
3	12/31/19	Usage of open source JavaScript framework for development and ongoing maintenance of Calculator 3.0 requires BHA to take a proactive approach to support and security.	IV&V learned in December 2019 that the Calculator 3.0 functionality is built in Vue.JS, an open source JavaScript framework. As this framework is relatively new, the open source support community is small. IV&V's concerns include: - The availability of reliable support for Vue.JS - The project's understanding of any known vulnerabilities with Vue.JS and development of a process to remain current on vulnerabilities discovered by the support community. - The RSM lead for Calculator 3.0 went on extended parental leave in December 2019 IV&V acknowledges that BHA has downloaded Vue.JS to start getting familiar with it	Open source tools and frameworks offer organizations great opportunities to build and configure customized solutions at lower costs than through software purchase or licensing. However, open source tools and frameworks often do not come with support models, other than those offered through the tool's community. Because of this, the organization bears the weight of seeking out reliable help and support, as well as much take a proactive approach to security and identifying any vulnerabilities in the tools.	IV&V recommends BHA research and determine the long-term sustainability of Vue.JS for Calculator 3.0 and work to establish a reliable and repeatable process for keeping abreast of communal updates and support opportunities. Additionally, IV&V recommends BHA continue to hold targeted KT sessions with RSM on maintaining Calculator 3.0 using Vue.JS, and determine what additional skillsets, training, and/or resources are needed to support BHA's long-term ownership of Calculator 3.0.	1/31/2020 - IVV attended a Knowledge Transfer session on the Calculator 3.0 application in late January. Discussion topics included code review, managing code branches, updating web resources, and known defects. The session was technical in nature and aimed specifically at a developer audience. DOH had three (3) developers in attendance and all in attendance appeared to grasp the concepts presented. The SI indicated that there will need to be 'several' more KT sessions on the Calculator 3.0 application in Vue.JS. It remains unclear at this juncture whether BHA has the capacity (resources, bandwidth, skillsets) to maintain the tool, which will be a determined through the execution of the KT sessions.	Targeted KT	Concern	N/A	Open		General	D Macdonald
5	01/31/20	Due to the project not following a detailed deployment script, the project may continue to experience defects related to deployment activities.	There have been several defects pushed to production with Phase 3 releases. Some of the defects introduced to production have been narrowed down to environmental promotional activities. In these instances, the DEV and TEST environments were not in sync with the production environment (missing business rules, missing components, missing dependencies, etc.). IVV is aware that DOH staff shadowed RSM staff for all deployment releases during Phase 2 with RSM providing instruction and DOH staff physically executing the tasks and activities via keyboard. For Phase 3, it is unclear whether a complete, up to date, and documented deployment script, or deployment notes, are being utilized by BHA for deployment activities.	A complete, up to date, and documented deployment script is needed to ensure the repeatability and stability of DOH's production deployments. Since there are currently two deployment types (patches and full solution upgrades), two scripts may be warranted. An embedded process and documented script will help ensure that mistakes are minimized, and that functionality is not mistakenly deprecated when deployments take place.	IVV recommends documenting deployment scripts for both the patch method and the full solution upgrade method. The script(s) should be in the form of a step-by-step procedure that walks through from start to finish of the deployment process, and involve several technical staff to ensure staff availability to accomplish these tasks when primary deployment personnel are unavailable.		Release / Deployment Planning	Concern	N/A	New			D Macdonald
6	01/31/20	The project lacks a documented 'Definition of Done', which could challenge the project's ability to fully achieve the goals of Phase 3.	BHA does not have a documented 'Definition of Done' (DOD) for the BHA Top 100 User Stories of for Phase 3. Because of this, it is unclear how proposed functionality/features are prioritized for each sprint, and throughout Phase 3.	The 'Definition of Done' document guides the Project's vision, business, and technical goals that are important inputs for stakeholders to develop a Roadmap for Phase 3. Without the 'Definition of Done' document, the project is likely to struggle to prioritize proposed functionality/features which may be equally important but are at odds with each other.	Project is currently in the process of creating the Definition of Done. IV&V recommends that the project create this document and socialize this with project team before end of Feb 2020 IV&V recommends that the project consider the items from the prioritized list, available resources and define "Done" as a percentage of the identified priority list with room for flexibility to add any other features/enhancements that will be identified during Phase 3.		Project Management	Concern	N/A	New			V Ramesh
7	01/31/20	The lack of consistent backlog grooming could result in the project backlog having obsolete, non-estimated, and poorly defined user stories.	The backlog of defects, requests, and user stories continues to grow. Currently, there are approximately 429 defects and requests, of which almost 200 have a status of 'New'. IVV notes that a large percentage of the backlogged work items do not have user story points estimated. Many of the items listed in the backlog are old, and some may have had needs or requirements change over time or may now be obsolete. IV&V notes that DDD and CAMHD have initiated this effort and agreed to prioritize grooming the backlog by the end of February.	A comprehensive, up-to-date backlog is a primary tenet of agile software development. If a backlog is carrying work items that may not ever be completed for any reason, they should be removed from the backlog to ensure its viability.	IVV recommends that CAMHD and DDD groom the backlog to bring it as current and accurate as possible. This should include deprecating items no longer needed, and fully defining those items that are not yet fully defined, readying them for configuration or developer resources. To the extent feasible, BHA should involve RSM SMEs in this process, if only for the interim to get "caught up" on grooming efforts.	1/31/2020 - IVV is aware that the RSM Solution Architect is being made more available than typical in February and possibly March, and that BHA is looking to take advantage of his skills and experience to assist in user story point estimations and design criteria. This should help ensure that needed items in the backlog can actually be acted upon when developer resources are available to execute.	Project Management	Concern	N/A	New			D Macdonald
8	01/31/20	The BHA Technical Team bandwidth may not be sufficient to meet the needs of the project, which could compromise project productivity.	The BHA Technical Team plays a role that is critical to project success. Currently, the responsibilities associated with the BHA Technical Team have expanded beyond their collective available bandwidth. IV&V notes that BHA began addressing this bandwidth issue, which includes increased collaboration with key RSM resources, and are working to potentially change the structure of the Technical Team.	The BHA Technical Team leads the efforts of all technical DOH staff on the project. As such, the Team's time is both extremely valuable and scarce. If the Team's expected workload exceeds bandwidth, the project could experience bottlenecks. Optimization of the BHA Technical Team's time is to the benefit of the project and plays a critical role in the project's ability to hit performance targets and achieve the Phase 3 definition of done.	IVV recommends the Project investigate mechanisms of increasing the bandwidth of the Solution Architect, either by bringing in additional resources through new hires, or through existing vendor contracts. Additionally, the project should assess, where possible, if there are responsibilities of the Solution Architect that can be reassigned to other project staff. Further, the Project should evaluate where process inefficiencies can be addressed and streamlined to possibly free up the Solution Architect's availability		Sprint Planning	Risk	Low	New			D Macdonald

ID	Identified Date	Summary	Observation	Significance	Recommendation	Updates	Process Area	Type	Priority	Status	Closure Reason	Iteration	Risk Owner
9	01/31/20	The lack of a Product Roadmap that provides direction on the top product features to be delivered in the near term (next 3 months), midterm, and long term could have an adverse impact on the Project's scope and schedule.	BHA does not have a single, definitive Product Roadmap for Phase 3 that addresses the functionalities, features, and / or enhancements to be built in order to fully address BHA's business needs. IV&V met with RSM and BHA on this topic in January, and notes that the project is actively working to address this concern.	A Roadmap is a tool that guides an agile project on what functionalities/features are targeted to be built and released and when users can have access to these functionalities. Without a defined Roadmap the project may not be able to effectively scope the top features to be released within Phase 3 and ensure the correct resources are available to accomplish the goal of each sprint and the Phase.	IV&V understands that the Project is in the process of creating a Short Term; Mid Term, and Long Term Roadmap. IV&V recommends the Project complete this by the end of February 2020 to understand if there are any constraints (resources, budget) that may hinder the project from releasing the needed functionalities/features targeted for Phase 3 as documented in the Definition of Done.		Project Management	Concern		New			V Ramesh