OFFICE OF ENTERPRISE TECHNOLOGY SERVICES

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June 19, 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
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

April 1 – April 30, 2020

Final submitted: May 11, 2020

PUBLIC CONSULTING GROUP

Solutions that Matter

Agenda

Executive Summary

IV&V Findings & Recommendations

Appendices

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

Executive Summary

The project successfully pushed a mid-sprint deployment and Release 3.7 into production in April. DDD successfully completed end-to-end regression testing for R3.7 demonstrating Test Practice Validation improvements. The project continues to pursue automated regression testing tools.

The RSM Team continued to provide essential support during April alleviating some of the bandwidth concerns expressed by DOH to meet crucial business needs.

The current COVID-19 pandemic is impacting the workload of project stakeholders. The project remains substantially on track with scheduled project tasks/activities and milestones.

Feb	Mar	Apr	Category	IV&V Observations
G	G	G	Sprint Planning	The sprint planning category remains Green (low) for the April reporting period, maintaining one active finding in the category. The RSM Team continued to assist the DOH Team with tasks and activities during April, alleviating some of the bandwidth concerns for the DOH staff. Staff support of backlog grooming and release planning efforts for future feature sets remain a concern.
G	G	G	User Story (US) Validation	IV&V continues to rate the User Story (US) Validation category at a Green (low) for the April 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 and will continue to monitor RSM's increased involvement in this category in the future.

Executive Summary

Feb	Mar	Apr	Category	IV&V Observations
Y	Y	Y	**Test Practice Validation**	IV&V continues to rate the Test Practice Validation category at Yellow (medium) for the April reporting period, maintaining one active finding. DDD developed regression test scripts and successfully conducted end-to-end regression testing for R3.7. This will reduce the amount of regression testing time for future releases. CAMHD continued their existing practice of function-based testing in lieu of formal regression testing for Release 3.7. IV&V will continue to monitor the progress being made in this category.
Y	Y	G	**Release / Deployment Planning**	IV&V reduced the rating for the Release / Deployment Planning category to a Green (low) for the April reporting period. IV&V has confirmed the presence of release Deployment Notes that outline step-by-step deployment procedures for production releases, attributing to the rating change. IV&V is unaware of any deployment issues that negatively affected the mid-sprint and Release 3.7 production deployments. IV&V will continue to monitor progress on proposed recommendations for this finding.
G	G	G	**OJT and KT Sessions**	IV&V continues to rate the OJT and KT Sessions category at Green (low) for the April reporting period and has no active findings in this category. RSM is working on putting together a skills matrix for BHA to help identify strengths, gaps, and training needs specific to long-term maintenance and support of the solution.
G	G	G	**Targeted KT**	IV&V continues to rate the Targeted KT category at Green (low) for the April reporting period and maintains one active concern in this category. The project scheduled a Calculator 3.0 Knowledge Transfer session in late April which IV&V attended.

Executive Summary

Feb	Mar	Apr	Category	IV&V Observations
G	G	G	**Project Performance Metrics**	IV&V continues to rate the Project Performance Metrics category Green (low) for the April reporting period. The project exceeded its planned velocity expectation for the R3.7 April deployment. IV&V will continue to explore the project's defect management process in May in order to better understand how defects are tied to a release or event.
G	G	G	**Organizational Maturity Assessment**	IV&V continues to rate the Organization Maturity Assessment (OMA) at Green (low) for the April reporting period. The project has requested additional areas to include in the next assessment which are currently being defined. The next OMA is slated for May 2020.
G	Y	Y	**Project Management**	IV&V continues to rate the Project Management category Yellow (medium) for the April reporting period. The current COVID-19 crisis has impacted the work of Project stakeholders, but current project work tasks and activities are being sustained.

Executive Summary

As of the April 2020 reporting period, there are a total of six open findings, comprised of one High Risk, four Low Risks, and one Medium Issue spread across the Sprint Planning, Release / Deployment Planning, Test Practice Validation, Targeted Knowledge Transfer, and Project Management assessment areas.

IV&V Findings by Category and Status

Test Practice Validation — Open: 1

Targeted KT — Open: 1

Sprint Planning — Open: 1, Closed: 1

Release / Deployment Planning — Open: 1

Project Management — Open: 2, Closed: 2

Legend: Open, Closed

X-axis: 0, 0.5, 1, 1.5, 2, 2.5
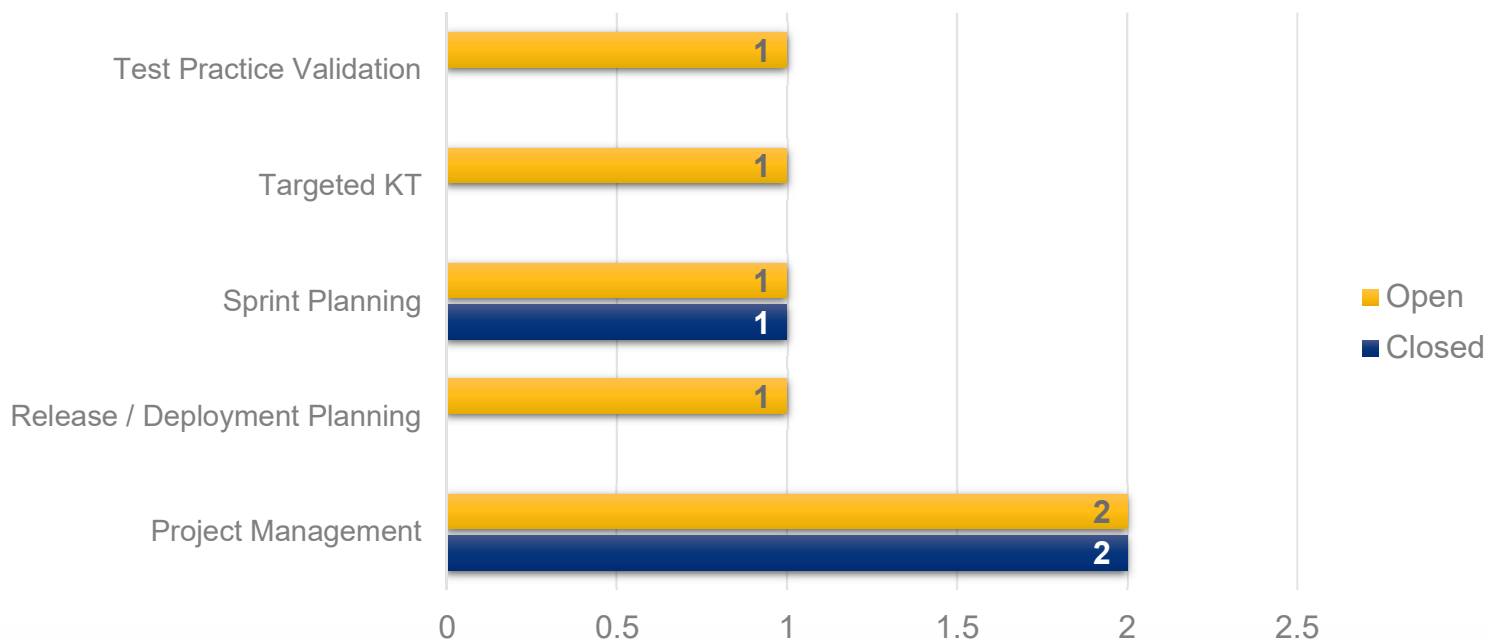
IV&V Findings & Recommendations

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
8	*Low Risk* **– The BHA Technical Team bandwidth may not be adequate to meet the needs of the project, which could compromise project productivity**. The RSM Team continued to assist the DOH Team in tasks and activities during April, which helped to alleviate some of the bandwidth concerns for the DOH staff. However, like our March reporting period, with backlog grooming and release planning for future feature sets planned for upcoming releases, DOH staff bandwidth continues to be a concern. IV&V will continue to monitor this finding during the May reporting period.	L

Recommendations	Status
• The Project should investigate mechanisms of increasing the bandwidth of the BHA Technical Team, either by adding resources through new hires, or existing vendor contracts.	In progress
• The Project should assess, where possible, if there are responsibilities of the BHA Technical Team that can be reassigned to other project staff.	In progress
• 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
Test Practice Validation

#	Key Findings	Criticality Rating
2	*Medium Issue* – **As a result of regression testing not being consistently performed, production releases are breaking and/or deprecating existing functionality in the production environment**. DDD has invested resources to develop end-to-end regression test scripts, which reduced the time necessary to execute this testing on a recurring basis. DDD successfully performed end-to-end regression testing prior to the production promotion of R3.7. CAMHD continued the practice of function-based testing in lieu of formal regression testing prior to the production deployment of Release 3.7 in April. This again worked satisfactorily, as IV&V is unaware of any functionality that was deprecated or broken by the 3.7 release. IV&V notes that the project is currently operating with an adjusted testing effort, conducting test sessions several times a week as opposed to once a week. The Project currently targets to commence the future automated regression testing effort during the 3.10 release. IV&V will continue to monitor the project's 'interim' regression testing processes during May.	M

IV&V Findings & Recommendations
Test Practice Validation (cont'd)

Recommendations	Status
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 releases 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. 8. Consulting with RSM to determine how the 'interim testing processes' can be improved until such time that automated testing is available for repeatable and complete industry standard regression testing. 9. Implementing 'hard' code freeze dates as well as test environment deployment dates to ensure that testing and deployment activities are not rushed.	In Progress

IV&V Findings & Recommendations
Release / Deployment Planning

#	Key Findings	Criticality Rating
5	***Low Risk* - Due to the project not following a detailed deployment script, the project may continue to experience defects related to deployment activities.** Release 3.7 was successfully promoted to production during the April reporting period. Similar to the last several releases, IV&V is unaware of any resultant deployment issues that affected production functionality. IV&V notes that the previous duplicative developer task notes issue has been resolved and that the Release Deployment Notes effectively guide the deployment activities. IV&V is reducing the criticality rating to low and will continue to monitor in May.	L

Recommendations	Status
• 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.	Completed
• Standardize the content of all developer deployment task notes, with a goal of eliminating any potential ambiguity to the Deployment Team, resulting in a cleaner and more repeatable set of deployment processes and instructions.	Completed
• As appropriate, consult with RSM on best practices that BHA could employ to support deployment.	In Progress
• Look at implementing 'hard' code freeze dates as well as test environment deployment dates to ensure that testing and deployment activities are not rushed.	New

IV&V Findings & Recommendations
Targeted KT

#	Key Findings	Criticality Rating
3	**Low Risk – 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**. The project continued to focus its attention on Calculator 3.0 User Stories and bug fixes during the month of April. The project scheduled a Calculator 3.0 KT session on April 30, 2020 which IV&V attended. Additional KT sessions have been discussed and will be scheduled. IV&V will continue to monitor this project component during May.	L

Recommendations	Status
• 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
• 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
7	**Low Risk - The lack of consistent backlog grooming could result in the project backlog having obsolete, non-estimated, and poorly defined user stories.** The project reported that 97% of the original backlog has been estimated at this time. That said, CAMHD has determined that there are several older, and possibly no longer necessary user stories in the backlog that are candidates for deletion. IV&V will keep this finding open and will re-assess it for impact during the month of May.	L

Recommendations	Status
• 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.	In Progress
• IVV recommends that the project consider utilizing an age-based methodology for the deprecation of 'older' user stories in the backlog that may no longer be applicable or needed by the Product Owners and developing a process for periodic cleansing of the backlog using the same methodology.	New

IV&V Findings & Recommendations
Project Management (cont'd)

#	Key Findings	Criticality Rating
10	**High Risk - The COVID-19 pandemic and the related "stay at home" order could hinder project activities and negatively impact the project schedule and budget.** During this reporting period, DOH's response to the COVID-19 pandemic required more staff time than anticipated, due to the time needed to plan for and provide services to its clients. Both the DDD and CAMHD Product Owners have stated that a significant percentage of available managerial and staff time has been redirected to the Department's COVID-19 response, as opposed to being able to focus on the project.	H

Recommendations	Status
• IV&V recommends BHA to ramp up efforts to setup, train, and assist stakeholders on remote work devices and tools and make every effort to help them to become highly functional with remote access technology (e.g. MS Teams/Skype).	Completed
• IV&V recommends the project and DOH create a detailed, documented risk mitigation strategy and plan that is reviewed regularly and revised to address the current state of the COVID-19 threat and related impacts over the next 6 to 12 months.	In Progress
• IV&V recommends updates to the OCM Plan to include any new activities or updates to planned activities to aid the organization through this COVID-19 situation in the short and long term.	Open

IV&V Findings & Recommendations
Project Performance Metrics

Metric	Description	IV&V Observations	IV&V Updates
Velocity	• 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	**April -** During Sprint Planning for Release 3.7, available velocity was calculated as 107 US Points (USP) with a total of 110 USP being released to production.	**April** – The project continues to estimate the User Stories in the Backlog. BHA resources are working in sequential order to estimate stories targeting those items tagged with 3.8, 3.9, 3.10, etc.

IV&V Findings & Recommendations
Project Performance Metrics (cont'd.)

Metric	Description	IV&V Observations	IV&V Updates
US Point Estimates vs Actuals	• 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	**April -** The Project Scrum Master closely tracks the USP on a daily basis. Determining the delta between USP estimates and actuals is work in progress.	**April** – DDD and CAMHD have standardized a format for resources to track hours. IV&V will analyze the tracked data to understand if there are any variances in the actual hours vs. projected at the time of sprint planning

IV&V Findings & Recommendations
Project Performance Metrics (cont'd.)

Metric	Description	IV&V Observations	IV&V Updates
Defect Metrics	Understand and track the following: • Defects by category (bug fixes) • US Points assigned to defects in a release vs US Points assigned to planned US in a release	**April** – Release 3.7 was comprised of 110 User Story Points that were released to production. • **88** User Story Points (**80%** of the total) were associated with planned user stories • **22** User Story Points (**20%** of the total) were associated with defects from the backlog. IVV notes that some of the "planned" items were production defects identified through previous releases and prioritized as part of the 3.7 backlog along with Requests that resulted in User Stories.	**April** – A mid-sprint deployment was conducted on 4/10/2020 to promote needed functionality associated with DOH's COVID-19 response activities. Release 3.7 was pushed to production on 4/17/2020.

IV&V Findings & Recommendations
Organizational Maturity Assessment

Measure	IV&V Observations
The Organizational Maturity Assessment is updated on a bi-monthly basis. The project has requested additional areas that encompasses the organization as a whole and not just the project team for assessment in May. IV&V will meet with the project to design the assessment to provide more insights into the maturity level of BHA as a whole organization.	

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 category 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
H	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.
M	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.
L	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 April 2020 reporting period:

1. Daily Scrum Meetings (selected)
2. Twice Weekly RSM Issues Meeting
3. Release 3.7 Deployment Planning Meeting
4. Release 3.7 Retrospective Meeting
5. Sprint Planning (Part 1 & 2) for Release 3.8
6. Weekly CCB Meeting
7. Weekly BHA-ITS Project Status Meeting
8. Bi-Weekly Check-in: CAMHD
9. Bi-Weekly Check-in: DDD
10. BHA IAPDU Planning Meeting
11. DHS Interfaces Meeting
12. Hawaii Help Desk Demo
13. Organizational Maturity Assessment Planning Meeting

Artifacts reviewed during the April 2020 reporting period:

1. Daily Scrum Notes (selected)
2. Twice Weekly Issues Meeting Notes (selected)
3. Release Notes – R3.7

Eclipse IV&V® Base Standards and Checklists

Document

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**	**5**	**6**	**6**				
Issue - high	N/A	0	1	1	0	0				
Issue - medium	N/A	0	0	0	1	1				
Issue - low	N/A	0	0	0	0	0				
Risk - high	N/A	0	0	0	1	1				
Risk - medium	N/A	0	0	1	1	0				
Risk - low	N/A	0	1	1	3	4				
Preliminary Concern	N/A	3	5	2	0	0				

Solutions that Matter

ID	Identified Date	Summary	Observation	Significance	Recommendation	Updates	Process Area	Type	Priority	Status	Closure Reason	Iteration	Risk Owner
1	12/31/19	Detailed investigation into the project's sprint planning processes and adoption of generally accepted agile best practices.	IV&V is currently investigating the following topics as they relate to Sprint Planning and the project's overall approach to agile software development: - IV&V acknowledges that the project is now planning three sprints outs, however, it appears that only a "high-level" sprint planning roadmap has been produced, and it is unclear exactly how the project is targeting features for each release through the end of Mod 4. - IV&V is not aware of how the project is currently defining "done" for Mod 3 and Mod 4 Additionally, in the January 2020 reporting period, IV&V will seek additional information and visibility into the project's processes specific to prioritizing requests and how user stories in TFS are tagged to features, as well as the realignment of project development and configuration resources to complete the scope of Release 3.5.	While having a high level roadmap is good, the project should be able to identify what feature enhancements will be targeted for each planned release. This roadmap will help the project manage scope and productivity. Relatedly, the "definition done" is an important artifact to ensure that the project is successful. Otherwise, the project will struggle to prioritize requests/enhancements and manage scope.	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. Additionally, 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.	01/31/2020 - 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.	Sprint Planning	Concern	N/A	Closed	Due to multiple new items being tracked at a more granular level, this item has been closed.	General	V Ramesh
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.	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. 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. 8. Consult with RSM to determine how the 'interim testing processes' can be improved until such time that automated testing is available for repeatable and complete industry standard regression testing.	04/30/2020 - DDD has invested resources to develop end-to-end regression test scripts, which reduced the time necessary to execute this testing on a recurring basis. DDD successfully performed end-to-end regression testing prior to the production promotion of R3.7. CAMHD continued the practice of function-based testing in lieu of formal regression testing prior to the production deployment of Release 3.7 in April. This again worked satisfactorily, as IV&V is unaware of any functionality that was deprecated or broken by the 3.7 release. IV&V notes that the project is currently operating with an adjusted testing effort, conducting test sessions several times a week as opposed to once a week. The Project currently targets to commence the future automated regression testing effort during the 3.10 release. IV&V will continue to monitor the project's 'interim' regression testing processes during May. 03/31/2020 - Prior to deployment of Release 3.6 being promoted to production in March, DDD and CAMHD continued their existing practice of function-based testing in lieu of formal regression testing to help ensure the quality of the solution being deployed. This worked satisfactorily, as IV&V is unaware of any functionality that was deprecated or broken by the 3.6 release. No verifiable progress was made for future automated regression testing during the March reporting period. IV&V will continue to monitor the project's 'interim' regression testing processes during April, as well as the project's progress towards starting automated regression testing. 02/29/2020 - Release 3.5 was promoted to production during February. In lieu of full industry standard regression testing, the deployment team performed testing by major function in the SIT2 and UAT environments after the 3.5 patch was applied, prior to the Production promotion. With automated regression testing not yet being	Test Practice Validation	Issue	Med	Open		General	D Macdonald

#	Date	Finding	Analysis	Impact	Recommendation	Status	Category	Type	Priority	Status	Closure	Area	Owner
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.	04/30/2020 - The project continued to focus its attention on Calculator 3.0 User Stories and bug fixes during the month of April. The project scheduled a Calculator 3.0 KT session on April 30, 2020 which IV&V attended. Additional KT sessions have been discussed and will be scheduled. IV&V will continue to monitor this project component during May. 03/31/2020 - Again there was no substantive change to this finding during the March reporting period, as the project focused its attention for the month to Calculator 3.0 User Stories and bug fixes, as opposed to Knowledge Transfer. The project is targeting to potentially schedule the next Knowledge Transfer session on this component during April. 02/29/2020 - There is no substantive change to this finding in the February reporting period, as the project focused its attention for the month to Calculator 3.0 User Stories and bug fixes, as opposed to Knowledge Transfer. IV&V is unaware if the next KT session for Calculator 3.0 having been scheduled. IV&V learned that the original RSM lead on Calculator 3.0 will be returning to work in April and is expected to resume her role in knowledge transfer to BHA. Additionally, IV&V learned that a key RSM resource will be made available to BHA on a 50% basis March – May, which could lend additional support to the project in key areas such as sprint planning, US validation, solution architecture, and release planning. 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	Targeted KT	Risk	Low	Open		General	D Macdonald
5	1/31/20	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. (COMPLETED) Standardize the content of all developer deployment task notes, with a goal of eliminating any potential ambiguity to the Deployment Team, resulting in a cleaner and more repeatable set of deployment processes and instructions. (COMPLETED) As appropriate, consut with RSM on best practices that BHA could employ to support deployment. (In Progress) Look at implementing 'hard' code freeze dates as well as test environment deployment dates to ensure that testing and deployment activities are not rushed. (NEW)	04/30/20 - Release 3.7 was successfully promoted to production during the April reporting period. Similar to the last several releases, IV&V is unaware of any resultant deployment issues that affected production functionality. IV&V notes that the previous duplicative developer task notes issue has been resolved and that the Release Deployment Notes effectively guide the deployment activities. IV&V is reducing the criticality rating to low and will continue to monitor in May. 03/31/2020 - Release 3.6 was successfully promoted to production during the March reporting period, and IV&V is unaware of any resultant deployment issues that affected production functionality. 02/29/2020 - 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, BHA uses a base deployment script, which is further modified by developer 'Deployment Task Notes' in AzureDevOps. These notes are not always consistently written and could potentially be the root cause of these anomalies when being compiled for a release. A complete, up to date, and documented deployment script inclusive of standardized developer deployment task notes 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), use of two scripts and the respective developer deployment task notes may be warranted. An embedded process and documented	Release / Deployment Planning	Risk	Low	Open		General	D Macdonald
6	1/31/20	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.	02/29/2020 - The project created and documented the Phase 3 Definition of Done and socialized it in February. IV&V recommends the project continually review and update the Definition of Done, adjusting as/if necessary. IV&V will continue to monitor the project's adherence to Definition of Done and progress against it but is closing out this concern as of the February report.	Project Management	Concern	N/A	Closed	Definition of Done completed and socialized.	General	V Ramesh

#	Date	Finding	Description	Impact	Recommendation	Status Updates	Category	Type	Severity	Status		Area	Owner
7	1/31/20	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. VV recommends that the project consider utilizing an age-based methodology for the deprecation of 'older' user stories in the backlog that may no longer be applicable or needed by the Product Owners and developing a process for periodic cleansing of the backlog using the same methodology.	04/30/2020 - The project reported that 97% of the original backlog has been estimated at this time. That said, CAMHD has determined that there are several older, and possibly no longer necessary user stories in the backlog that are candidates for deletion. IV&V will keep this finding open and will re-assess it for impact during the month of May. 03/31/2020 - IV&V validates that the backlog grooming effort has made great progress, however it is still in progress. The revised target date for completion was most recently 3/31/2020. The estimation effort has reached 94% completion at the end of March and this includes new requests that have come in over the last three weeks. IV&V notes that this effort also has competing priorities, as the project is also looking to review, develop requirements and develop user stories for releases 3.9 and 3.10 in parallel. IVV will continue to monitor this finding in April. 02/28/2020 - IVV validates that the backlog grooming effort is still in progress. The project anticipates the grooming process should be completed by March 16. It is still anticipated that RSM resources could support BHA in this effort to some degree. IV&V will continue to track this concern in order to monitor progress made in March. including any changes that may be made to the current approach. 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	Risk	Low	Open		General	D Macdonald
8	1/31/20	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.	04/30/2020 - The RSM Team continued to assist the DOH Team in tasks and activities during April, which helped to alleviate some of the bandwidth concerns for the DOH staff. However, like our March reporting period, with backlog grooming and release planning for future feature sets planned for upcoming releases, DOH staff bandwidth continues to be a concern. IV&V will continue to monitor this finding during the May reporting period. 03/31/2020 - The RSM Team assisted the DOH Team in tasks and activities during March, alleviating some of the bandwidth concerns for the DOH staff. However, with backlog grooming and release planning for future feature sets in releases 3.9 and 3.10, DOH staff bandwidth continues to be a concern. IV&V will continue to monitor this finding during the April reporting period. 02/28/2020 - IV&V observed the BHA Technical Team continues to experience a lack of bandwidth. Moving forward, the project has discussed ramping up additional RSM resources to assist the Technical Team with their tasks and activities, as well as continued knowledge transfer. IV&V will continue to monitor this finding as more details are made available.	Sprint Planning	Risk	Low	Open		General	D Macdonald
9	1/31/20	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.	02/29/2020 - In February, the project further defined the Phase 3 Product Roadmap and aligned it with the Phase 3 Definition of Done. IV&V recommends the project continually review and update both the Product Roadmap and Definition of Done, adjusting as necessary. IV&V will continue to monitor the project's adherence to the Product Roadmap and progress against it but is closing out this concern as of the February report.	Project Management	Concern	N/A	Closed	Product Roadmap aligned with Definition of Done	General	V Ramesh

| 10 | 3/31/20 | The COVID-19 pandemic and the related "stay at home" order could hinder project activities and negatively impact the project schedule and budget. | On 3/23/2020, the Governor issued a "stay at home, work from home order" that has reduced state departments ability to be fully functional as the large majority of state workers will be required to work from home/remotely at least until the end of April and some offices may be completely shut down until that time as well. Unclear if the order will extend beyond that date. | DOH stakeholder participation in key activities could be significantly hindered, not only by required remote work by DOH and SI staff, but also by the flood of activities that could occur as the department could become overwhelmed processing and providing services due to the resulting economic impacts to citizens. Some stakeholders may be unable (due to stricter shutdown policies) or unwilling to perform these activities during this chaotic time. Planned SI on-site visits will also likely be changed to remote which could reduce the effectiveness of their project activities. Going forward most if not all project activities will more than likely be conducted remotely until this crisis passes. | - IV&V recommends BHA to ramp up efforts to setup, train, and assist stakeholders on remote work devices and tools and make every effort to help them to become highly functional with remote access technology (e.g. MS Teams/Skype).
- IV&V recommends the project and DOH create a detailed, documented risk mitigation strategy and plan that is reviewed regularly and revised to address the current state of the COVID-19 threat and related impacts over the next 6 to 12 months.
- IV&V recommends updates to the OCM Plan to include any new activities or updates to planned activities to aid the organization through this COVID-19 situation in the short and long term. | 04/30/2020 - During this reporting period, DOH's response to the COVID-19 pandemic required more staff time than anticipated, due to the time needed to plan for and provide services to its clients. Both the DDD and CAMHD Product Owners have stated that a significant percentage of available managerial and staff time has been redirected to the Department's COVID-19 response, as opposed to being able to focus on the project. | Project Management | Risk | High | Open | | | | Darren |