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January 4, 2022

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

The Honorable Scott K. Saiki,
Speaker, and
Members of The House of Representatives
Thirty-First 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 reports to the Legislature within ten days of receiving the report, please find attached the Lessons Learned report the Office of Enterprise Technology Services received for the State of Hawaii Department of Education's FMS Modernization Project.

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

Sincerely,

Douglas Murdock (Jan 4, 2022 13:31 HST)

Douglas Murdock
Chief Information Officer
State of Hawai'i

Attachment (2)

PUBLIC CONSULTING GROUP

Solutions that Matter

Hawaii Department of Accounting and General Services Office of Enterprise Technology Services

# Aukahi Financial Management System (FMS) Project

## Department of Education

## IV&V Aukahi FMS: **Lessons Learned**

*Version: 2.0 - Final*

*November 29, 2021*

## Document History

| Version | Date | Brief Description of Modifications |
|---|---|---|
| 1.0 | October 22, 2021 | Draft submitted to state for review. |
| 2.0 | November 29, 2021 | Final submitted to state. |
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# Table of Contents

# *INTRODUCTION*

The State of Hawaii's (SOH) Office of the Enterprise Technology Services (ETS) acquired the services of Public Consulting Group (PCG), to provide Independent Verification and Validation (IV&V) services for the Department of Education's (DOE) Aukahi FMS Project that went live on July 19, 2021. The IV&V services provided by PCG included monthly reports as well as the delivery of this Lesson Learned report. This report is intended to outline key areas of risk that the project faced, which mitigation strategies worked well, and which lessons learned were realized that could benefit similar initiatives in the future. IV&V has reported these risk areas and associated recommendations to the project via IV&V monthly status reports and verbal communications.

### 1.1 Purpose

The purpose of this report is to document lessons learned from risks and issues, identified during the Aukahi project, that could be used to enhance processes and methodologies going forward. The intent is to help the State avoid recurrence of risks in the future as well as help improve their overall organizational maturity and improve the success rate and efficiency of executing similar projects in the future. This report was developed so that it could easily be shared with and benefit other State of Hawaii (SOH) departments.

This report includes a narrative that describes the top 3 lessons learned followed by a list of other lessons grouped by the same key sections that IV&V Monthly Status reports utilize to describe the project's subject areas. It should be noted that these lessons learned should in no way reflect negatively on the project team and their leadership. IV&V identified risks early on that the project team was understaffed for this level of effort and that the DOE felt compelled to accept risks associated with an aggressive schedule due to their failing legacy FMS system. In the end, the project team was able to achieve a high level of success, despite facing many challenges, largely through heroic efforts put forth by the project team.

### 1.2 Project Background

In October of 2018, the aging legacy DOE FMS system failed, was offline for several weeks, and led to significant disruption of critical operations. As a result, the DOE quickly procured and launched the Aukahi project with the goal of replacing their FMS as quickly as possible to avoid a similar event. The project elected to execute an aggressive, accelerated timeline with a planned January 2021 go-live date that was later re-baselined to July 19, 2021. DOE has acknowledged that this aggressive schedule resulted in an increased risk profile, which DOE has indicated they were willing to accept given the potential larger risks associated with a similar, or more catastrophic, legacy FMS failure.

The state contracted CherryRoad Technologies as the system integrator (SI) to implement Aukahi on the Oracle Financials (OF) Cloud platform and provide key management and technical services for the duration of the project. To speed implementation, the project elected to leverage Agile development methods, limiting the amount of new or improved functionality, and scaled back early analysis efforts.

# TOP 3 LESSONS LEARNED

The following describes project lessons learned starting with the "Top 3 Lessons Learned" followed by a more extensive list of lessons learned grouped by the same IV&V risk categories utilized in the monthly IV&V reports.

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| ***#1*** | **Establish governance and service management standards and processes prior to project initiation** |

One definition of governance states, "Governance encompasses the system by which an organization is controlled and operates, and the mechanisms by which it, and its people, are held to account. *(www.governanceinstitue.com.au*)"

IV&V observed numerous opportunities to create efficiencies and reduce risk through the establishment of organizational governance and service management processes and controls. These opportunities include reviewing governance, policies, and procedures, relevant to the project and launching initiatives to address gaps prior to project initiation. IV&V recommends governance be clearly defined, documented, and regularly reviewed/refined and updated. This governance could then be applied to all future projects as well as other operational processes. For example, the State may identify the need to review policies related to internal controls, or more specifically, those related to the segregation of duties and fraud prevention. Documented governance could require all new software be tested and/or analyzed for fraud prevention, segregation of duties, and other security controls, and require the organization's Chief Information Security Officer (CISO) evaluate and sign-off on the readiness of the system prior to go-live.

IV&V also recommends establishment of service management standards, practices, and processes (ideally based on industry standards and best practices, e.g., ITIL) that could increase the State's overall IT maturity level, create efficiencies, and reduce risk on future IT implementations. For example, establishment of strict release management policies and practices, along with clear governance that requires software vendors to comply, could help to prevent software release missteps that often lead to project schedule delays and unnecessary rework.

## #2 Assemble a team of highly capable personnel to fill key roles on the project team

IV&V recommends that project organizers realize that not all teams are created equal and that staffing for quality talented resources is no simple task. In a state where IT workforce development has been a challenge, it is particularly important to find innovative ways to bring together and (more importantly) retain exceptionally talented individuals. Project leadership has the opportunity to develop high-performing teams that grow in efficiency on concurrent projects as familiarity and comradery develops. DOE was able to assemble a project team that included 4-5 highly capable and committed individuals who were able to not only drive the project to a successful go-live but were also able to mitigate several risks and make up for several SI shortcomings. In IV&V's view, these individuals were major contributors to project success and played key roles in the areas of project management, OCM, training, testing, and system design. Although many of them had never played a role on a software development project team, they were able to quickly adapt to the need at hand and perform admirably given the circumstance.

To help prevent unnecessary risk, IV&V recommends projects be fully staffed with both operational and project team members, according to a detailed resource loading plan. This helps to prevent time being spent on planning or reorganizing at critical times in the project. IV&V recommends the State make extraordinary efforts to assemble a project team of highly capable staff to fill the most critical project roles (in particular: Lead Business Analyst and Project Manager roles).

Assembly of a high performing team includes the SI and other project partners. The State should work to ensure their SI partners provide key resources who have proven capability on similar projects, have excellent communications skills, and they effectively meet the needs of the current project. IV&V recommends the State enforce strong vendor management practices to assure the SI functional and technical team leads meet expectations and are not junior resources learning their lead role during the project. The State should make early efforts to vet each SI team lead to assure they have held the same lead position on multiple successful projects, so the State can benefit from their veteran experience and can rely on their leadership to drive their respective areas as well as guide/coach State resources who may

lack software development project experience. Solicitations (e.g., Request for Proposal) should allow the State to approve and/or replace any SI team member.

Finally, IV&V recommends project organizers recognize the value of highly skilled lead business analyst (BA) to help drive various elements of the software development lifecycle, ensuring quality designs and process improvement throughout the project. IV&V recommends projects include both a State Lead BA and an SI Lead BA who would work closely together through the project. The State Lead BA would focus on representing State interests and evaluating State business processes, and the SI Lead BA could focus on analysis of automating State processes leveraging their understanding of the capabilities of the technology. Many organizations have diminished the BA role over the years and lost sight of the value this role can bring to projects like Aukahi. Further, with the growing popularity of Agile, SI's will often skip initial analysis (often called "Sprint zero") efforts and move quickly to development, often relying on developers who may lack business analysis skillsets. For future solicitations, IV&V recommends the State require the SI provide a highly skilled lead BA from project kickoff through post go-live support. This BA would accumulate knowledge of both the customers business processes and the new system design and provide project knowledge continuity throughout the project. This BA would begin with playing a primary role in building relationships and coaching State stakeholders, learning legacy systems, as well as requirements gathering, elaboration, and scope clarification activities. They would then move on to assist with system design, training, testing, and post go-live support, leveraging their depth of knowledge of the customer's business to improve the quality of each of these phases of the project and reduce the burden on customer SMEs. The State could set expectations in the solicitation that the SI Lead BA would develop deep knowledge of customer business processes and make every effort to optimize and transform business processes through the crafting of modern system designs.

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| **#3** | **Early capacity planning including offloading operational duties from the project team to increase their capacity for project participation** |

Key DOE SMEs were often overwhelmed during the project which created project bottlenecks, reduced morale, and led to project schedule delays. The project made late efforts to augment their team to reduce these bottlenecks, but early resource planning could have avoided these schedule delays and morale issues. Early planning for backfilling for key state resources can help to reduce risks related to overburdening team members with project activities that are in addition to their daily workload. Providing some relief to these individuals from their day-to-day responsibilities allows them to focus on project activities and ensuring a quality system design that fully meets their user's needs and expectations.

Early capacity planning along with development of a resource loading and management plan can help to avoid last minute efforts to fill key roles and avoid schedule slippage due to staffing capacity constraints. IV&V recommends the project work with Human Resources (HR) to evaluate all available project staffing options including, 89-day hires, exempt employees, independent contractors, and staffing agencies, and select the most effective staffing solution. Failure to make early efforts to staff the project can lead to late staff augmentation efforts requiring the State to augment their project team with expensive large consulting firm resources that could negatively impact the project budget.

IV&V also recommends project leadership closely monitor project productivity and meet regularly to perform continuous process improvement and take steps to closely monitor project team capacity to assure their resources are not overallocated.

# MORE LESSONS LEARNED

This section details project lessons learned, many of which are framed as recommendations that were posed by IV&V during the project. Some of these lessons learned have been framed as what the project did well that could be a lesson learned for future projects. These have been grouped by IV&V findings categories and subject areas.

## Human Resource Management

| Human Resource Management | |
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| **SUBJECT AREA** | **LESSONS LEARNED** |
| Retention of most talented key resources | • Once highly talented, key project resources are identified, work quickly to increase project team resources to support them, so they are not overwhelmed, overtaxed, or over relied upon. Overtaxed individuals will often reach a breaking point and end up abruptly leaving the project, which can significantly disrupt the project due to the extent they were relied upon.<br>• Distribution of workload to avoid over reliance on the project's most talented, skilled, and overtaxed individuals.<br>• Develop a Knowledge Management (KM) strategy to help ensure project knowledge (tacit and otherwise) is not lost when staff leave the project or state employment.<br>• Survey project resources to determine job satisfaction and take appropriate steps to increase retention.<br>• Conduct exit interviews for departing project resources and work quickly to address issues that negatively impact project participation and job satisfaction.<br>• Develop an approach to expedite succession planning and identify and plan for near-term knowledge transfer activities. |
| Project team training | • Projects of this size and complexity should include training for key project team members prior to initiation. Many State workers who are asked to participate in projects often have little to no software development lifecycle (SDLC) experience. IV&V recommends providing some SDLC or implementation methodology (e.g., Agile) overview training.<br>• If the project will be implementing in a Software as a Service (SaaS) platform, or the like, IV&V recommends multiple demonstrations of the system capabilities to SMEs prior to requirements gathering or analysis efforts so they can be more productive and effective when working with the SI on optimal system designs and process improvements. |

## Organizational Change Management

| Organizational Change Management | |
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| **SUBJECT AREA** | **LESSONS LEARNED** |
| High-functioning OCM team | • The DOE was able to assemble a high-functioning, talented group of DOE OCM team members that demonstrated an exceptional understanding of user expectations and needs and was able to formulate effective communications to prepare their users for the changes the new system would bring. This had a significant positive impact on the Aukahi project and mitigated several risks. |
| Effective communications to prepare users for the system challenges they would face | • Due to the accelerated schedule, the Aukahi system was implemented with several limitations, workarounds, and significant changes to their existing processes. The OCM team prepared multiple communications via a weekly "Countdown to go-live" newsletter to not only prepare users for these changes but to build anticipation and buy-in for the long-term potential and benefits of the new modernized, cloud-based system. IV&V recommends similar methods be applied for other State projects. |
| User surveys | • Perform regular user surveys to obtain objective user satisfaction feedback and metrics as well as identification of help desk and support process improvement opportunities. |
| Super SME (aka, Change Champion, Super User) | • Consider instituting a distributed model/strategy (e.g., "Super SME") to train select State staff to support, for example, tier 1 user assistance, testing, on-going training, and OCM communications. |

## Project Organization & Management

| Project Organization & Management | |
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| **SUBJECT AREA** | **LESSONS LEARNED** |
| Early Analysis | • Due to the accelerated schedule, the project elected to forego many initial analysis activities. However, IV&V recommends that in order to mitigate risks of an aggressive schedule, the SI focus their resources and efforts on performing adequate, focused analysis prior to initiation of development. Aukahi SMEs and IV&V observed several challenges that were likely because of the lack of early, adequate SI analysis efforts. With the advent of Agile methodologies, the emphasis on analysis is often mistakenly diminished and often leads to poor system and process design decisions that can lead to unexpected rework. Modern Agile experts typically propose adequate analysis efforts during Sprint Zero, and caution against carelessly diminishing or eliminating analysis. IV&V recommends future projects establish gates that would assess whether sufficient early analysis has been performed before moving to development phases. |
| Hold the SI to high personnel and deliverable quality standards | • IV&V noted several SI personnel quality challenges throughout the project that impacted both the schedule and the quality of system designs. SI's will often insert junior or unqualified resources into lead position on the project team as a cost saving measure. The State should hold the vendor to high standards for filling lead project roles to |

| Project Organization & Management | |
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| | assure these areas are led by experienced, highly capable individuals who are able assure the quality of deliverables and optimal system designs and reduce rework. |
| Soft launch advantages | • Though the project elected to perform a "big bang" rollout, they were able to effectively mitigate risks by doing a soft launch the weekend before go-live. This soft launch proved effective at identifying bugs that could have disrupted go-live and minimizing risks. |
| Address off-shore SI team challenges | • If offshore resources are employed by the SI, IV&V recommends the State request the SI make efforts to move their team closer to the local time zone and address time zone challenges. Alternatively, the State can request they change their working hours to align with Hawaii work hours. |
| Project management practices | • Recommend DOE consider establishing a Project Management Office (PMO) that could establish standards for organization-wide PM best practices for management of all DOE projects. |
| Help desk readiness | • Make early efforts to evaluate existing State Help Desk (HD) capabilities, potential gaps, and how the new system will be effectively supported by this infrastructure. Once gaps are identified, early efforts should be made to capacity plan and fill gaps to avoid late game efforts close to go-live.<br>• Evaluate existing help desk reporting and optimize as necessary to meet the needs of the new system to optimally track and improve processes to assure sufficient user support.<br>• Prioritize resolving potential system issues that could generate the highest number of tickets, recognizing the accumulated amount of effort required to manage each ticket. Help desk processes should include root cause analysis of tickets so developers can work to quickly resolve root cause problems and reduce the number ticket being originated for that problem. This can also help minimize accumulated technical debt. |
| Transition to state resources taking over post go-live support of the system | • Recommend utilization of a resource management plan to address gaps in the system support team to ensure they are able to meet expectations for project post go-live support. For cloud platform solutions (like Oracle Financials), recommend identifying (or augmenting their IT staff with) an additional resource to manage compulsory quarterly cloud platform updates and regression testing.<br>• Consider preparing return on investment (ROI) data to present to the legislature that could clearly justify the cost of highly compensated resources that could potentially provide cost savings to the state compared to the cost of equivalent vendor support contracts.<br>• Prepare a transition plan that is thoroughly vetted prior to go-live. Transition plans should allow time for project resources to share their knowledge with production support staff and to validate they are ready and capable of taking over support before go-live.<br>• Prepare a Knowledge Transfer (KT) plan to assure State resources, who will be expected to administer, configure, maintain, and/or support the system, are sufficiently trained prior to being asked to assist. IV&V recommends the State include technical training in the project budget for these resources; ideally training would be initiated prior to project initiation.<br>• Consider requiring the SI include State IT resources (side by side with SI experts) in technical activities to accelerate learning of the system. |

| Project Organization & Management | |
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| | • Develop and implement a long-term strategy for providing effective ongoing M&O support. This strategy should ensure that there is sufficient capabilities and capacity to provide the required support to meet user needs. |