




STATE OF HAWAII
DEPARTMENT OF EDUCATION
P.O. BOX 2360
HONOLULU, HAWAII 96804

OFFICE OF THE SUPERINTENDENT

November 21, 2019

TO: The Honorable Kenneth Uemura
Chairperson, Finance and Infrastructure Committee

FROM: Dr. Christina M. Kishimoto
Superintendent 

SUBJECT: **Update on Department of Education Financial Management System Modernization**

This memoranda provides an update on the current status of the Financial Management System (FMS) Modernization project as well as the events which accelerated the need to replace the Department of Education (Department) incumbent FMS software application.

I. EXECUTIVE SUMMARY

The Department's Office of Information Technology Services (OITS) is providing a status update to the Finance and Infrastructure Committee (FIC) on the FMS Modernization. The update will focus on the following areas with detailed information provided starting on page 3:

1. Recap of FMS Outage October 2018.
On October 6, 2018, the Department's FMS system encountered multiple complications following a critical upgrade. The system was down for a period of three weeks during which time approximately \$15 million in payments were impacted including high priority school facilities vendors, workers compensation claims, and special education vendors.
2. Acquisition Overview.
The Department conducted a Request for Information (RFI), then prepared a draft Request for Proposal (RFP), before identifying that National Association of State Procurement Officials (NASPO) contracting could speed procurement substantially.
3. Enterprise Resource Planning Modernization Framework Context.
The Department has placed FMS modernization in a broader strategic context, seeking to leverage the effort to replace FMS into future, broader work replacing more Enterprise Resource Planning (ERP) software.

4. Acquisition Objective & Anticipated Benefits.

The replacement for FMS will remove the critical operational issue facing the Department (namely that FMS is unsustainable) and modernize financial processes, providing greater transparency.

5. Acquisition Approach & Timeline.

The Department is in the midst of procuring the replacement using NASPO, DAGS, Enterprise Technology Services (ETS), and University of Hawaii are all active participants in the acquisition approach. The goal is to have a replacement available for cut-over by July 1, 2020.

6. Evaluation Approach.

With input from Gartner to provide a vendor-neutral perspective, the Department prepared a solicitation for NASPO vendors. Requirements were gathered from across the Department, including tri-level input.

7. Evaluation Criteria.

Scoring of vendor presentations includes relevant Department leadership, as well as cross-agency leadership, including the State Chief Information Officer.

8. Justification/Recommendation.

The Department evaluated several alternative approaches and determined that a replacement is the best option, with additional support from ETS to maintain the legacy FMS, despite the planned decommission of ETS's present mainframe.

II. HISTORY

The FMS modernization plans were presented at the February 21, 2019 FIC meeting. Link to Minutes:

<https://alala1.k12.hi.us/STATE/BOE/Minutes.nsf/a15fa9df11029fd70a2565cb0065b6b7/7b8dbe1e7111d1be0a2583d0007a5f68?OpenDocument>

An update of the Department's five-year technology plan which included an update of FMS was presented at the April 18, 2019 FIC meeting. Link to Minutes:

<https://alala1.k12.hi.us/STATE/BOE/Minutes.nsf/a15fa9df11029fd70a2565cb0065b6b7/1a04467e9faab760a2583f6007bc46b?OpenDocument>

III. PURPOSE OF REPORT

The purpose of this report is to provide a status update of the FMS modernization. The last update was provided to the FIC on April 18, 2019.

Recap of the FMS Outage October 2018

On Saturday, October 6, 2018, the Department's FMS encountered multiple complications following a critical upgrade. A planned outage that should have lasted no more than eight hours resulted in a disruption of service spanning several weeks. The Department schools, district offices, and State offices were unable to perform purchasing, fixed assets, cash receipts, check writing, and inquiries and reports functions. Moreover, payments to vendors – nearly 2,000 checks totaling approximately \$15 million in payments – were impacted including high priority school facilities vendors, workers' compensation claims, and special education vendors. This puts the Department at risk of incurring late-payment penalties and other adverse conditions. (Note: The ETS system supporting FMS is a combination of an IBM Db2 v10 database, CICS v4.2, Enterprise COBOL V4.2 application, and IBM z/OS v2.2 System and JCL software. The age of the IBM Db2 database, CICS, and COBOL are beyond the support-life provided by the software vendors. Maintaining the status quo is not an option.)

The OITS technology staff, along with experts from ETS and contracted teams, actively and urgently worked to bring this critical system back up. Once FMS was adequately restored, the Department phased in access to all schools, district offices, and State offices to begin processing purchase orders and payments. Users were instructed to limit transactions to high priority payment processing plus two days of backlogged workload, and repeat this pattern until caught up with the backlogged workload. The phased, roll out approach was necessary to not overwhelm the system and to also ensure all aspects of the system were functioning properly.

Beginning Wednesday, October 31, 2018, the normal weekly schedule resumed. All schools, and State offices were able to access FMS without restricted access or processing rules. FMS continued (and still continues) to experience system issues but so far with minimal impact.

1. (2018, October 19). *Statement on the outage of the Department's financial management system (FMS)*. Retrieved from <http://www.hawaiipublicschools.org/ConnectWithUs/Vendors/Pages/FMS-outage.aspx>
2. Essoyan, Susan. (2018, October 22). Vendors waiting after DOE payment system crashes. *Star Advertiser*. Retrieved from <https://www.staradvertiser.com/2018/10/22/hawaii-news/vendors-waiting-after-doe-payment-system-crashes/>
3. Morales, Manolo. (2018, October 25). DOE pushes through delayed payments to vendors after financial system crash. *KHON2*. Retrieved from <https://www.khon2.com/news/doe-pushes-through-delayed-payments-to-vendors-after-financial-system-crash/>

4. (2018, October 25). *HIDOE NEWS RELEASE: HIDOE BEGINS PROCESSING PAYMENTS TO VENDORS AFTER RESTORING FINANCIAL PLATFORM*. Retrieved from <https://governor.hawaii.gov/newsroom/latest-news/hidoenews-release-hidoebegins-processing-payments-to-vendors-after-restoring-financial-platform/>

Acquisition Overview

Starting in November 2018, OITS began the process of documenting a RFP to specify the requirements to replace the existing FMS. During this process, OITS engaged multiple offices within the Department in an effort to elicit requirements for the new replacement. During one of these meetings with Office of Fiscal Services (OFS), specifically the Procurement and Contracts Branch (PCB), the NASPO organization was drawn to OITS' attention. The advantage of using NASPO vs. an RFP in this situation were suggested by OFS/PCB to be one where the Department could save significant time in the procurement process without putting at risk the specificity of the requirements of the solution. This is due to the nature of this project which is to replace the incumbent solution with a commercial off the shelf (COTS) software solution. NASPO already has negotiated competitive contracts which allow for the direct purchase of this class of software. During the investigation phase of engaging NASPO's service, OITS identified a specific NASPO contract agreement which allows for both COTS software as well as all of the requisite professional services to make such a product a viable solution for an organization the size and complexity of the Department.

The Department is seeking to acquire a fully integrated modern Core Financial Management Solution to support current and future business processes, via the NASPO ValuePoint Cloud Solutions Master Contract.

When OITS last updated the Board of Education, OITS, in collaboration with OFS, Office of Facilities and Operations (OFO), and Office of Talent Management (OTM), was developing an RFP, building on a RFI. As OITS worked with the Department's Procurement team on that RFP, Procurement identified the NASPO contracts as a possible vehicle to accelerate acquisition. OITS additionally contracted with Gartner Consulting to provide a vendor-neutral review of relevant technology - Gartner confirmed that NASPO has a viable approach in their NASPO ValuePoint Cloud Solutions solicitation #CH16012. Gartner worked with OITS to refine the RFP to maximize the advantages to the Department of the using NASPO contract.

The Department intends to acquire a complete solution consisting of software licensing (preferably Software as a Service – SaaS delivery model), related cloud hosting and support services, and implementation services (including project management, installation, configuration, training, and other services) as defined in the NASPO acquisition package.

This new modern system should fully replace existing functionality in Department's current FMS and may also provide a limited amount of new and/or improved functionality.

ERP Modernization Framework Context

ERP is a modular software system designed to integrate the main functional areas of an organization's business processes into a unified system. An ERP system includes core software components, often called modules, that focus on essential business areas, such as finance and accounting, Talent Management, production and materials management, customer relationship management (CRM) and supply chain management. Organizations choose which core modules to use based on which are most important to their particular business.

The immediate replacement of FMS became a top priority in October 2018 following a three-week system outage. The Department has established a target date of July 1, 2020, to implement the FMS modernization to mitigate the risk of another catastrophic failure of the incumbent system. Given an estimated implementation timeline of under one year, the Department needs to have contracting completed for the FMS modernization as soon as possible. The Department is seeking an accelerated acquisition and implementation to mitigate the risk of another critical outage, and has identified the NASPO Cloud Solutions Master Agreement as a valid contracting vehicle that can shorten the project timeline while still providing access to the most highly rated solutions at competitive rates.

While the FMS modernization is being prioritized over the replacement of other legacy systems, the Department is developing an ERP Modernization Framework in parallel to executing this acquisition. The Department is planning to modernize legacy ERP systems supporting Financial Administration, Talent Management, Budget Management, Procurement, and Asset Management capabilities using a multi-year approach sequenced to minimize the time necessary to provide these high value solutions to the organization.

FMS will serve as the first component of a longer-term, comprehensive ERP modernization program. The Department is in the process of finalizing the overall target architecture for ERP Modernization, and will subsequently develop a roadmap for its implementation. The Department plans to take a Postmodern approach (shown below) that provides optimal functional agility based on business needs and focuses on the appropriate level of integration between solution sets and components. This optimal functional agility is achieved through loose-coupling among the five major systems of the target architecture. Loose coupling will provide the opportunity for the Department to modify or replace the systems comprising the five major systems without incurring an impact to the other major systems supporting the overall ERP solution.

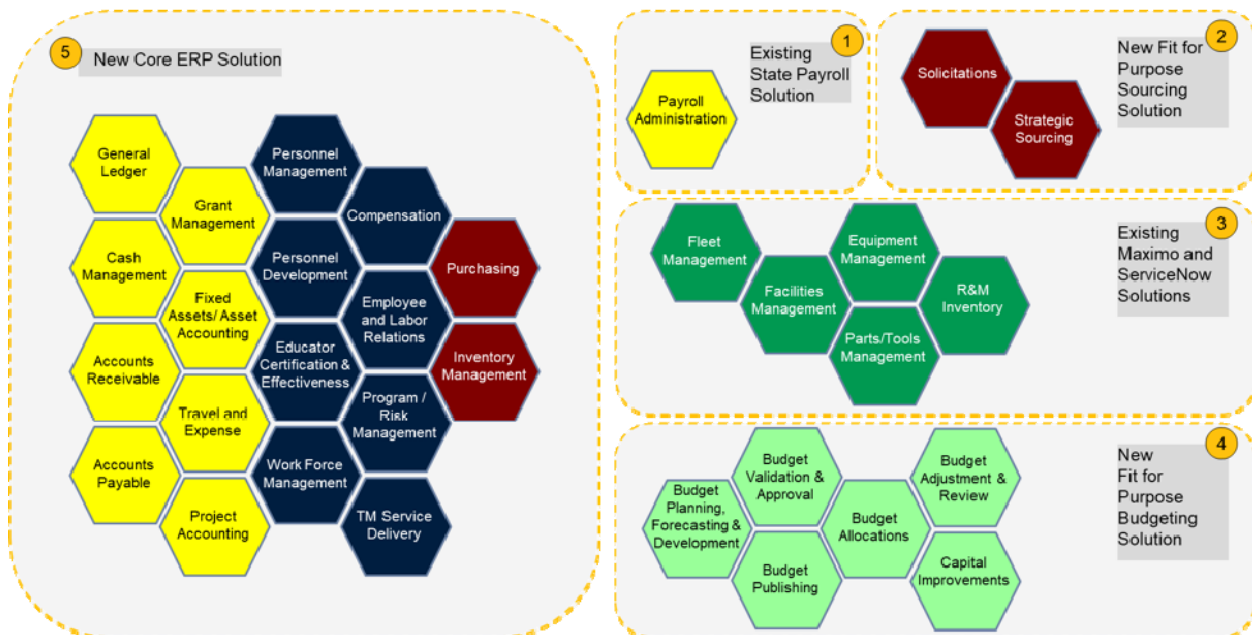


Figure 1. HIDEOE ERP Modernization Target Architecture (Draft View)

The Department anticipates that the full ERP modernization will take place over many years. While this acquisition is focused on the FMS modernization components of the solution, the Department has included some exploratory questions and requirements covering additional functionality (beyond the scope of this immediate procurement) within this acquisition package, including:

- Strategic Sourcing & Solicitations,
- Talent Management (HR Core, Recruiting, Talent Management Solutions),
- Budget Preparation & Execution (Planning Solutions), and
- Reporting & Analytics (for capabilities beyond financial reporting and analytics which is included in the requested scope of this acquisition)

given the potential for a more narrowly scoped FMS modernization to constrain future replacement options.

Preference will be given to bidders who align with and have demonstrated their ability to realize the Department's long-term vision of an interoperable platform.

A sample conceptual view of a functional roadmap for ERP Modernization is shown in the figure below. The Department envisions the FMS modernization solution will also be gradually enhanced over time. Once the overall target architecture for the Department's ERP Modernization is finalized, and will develop a roadmap for its implementation.

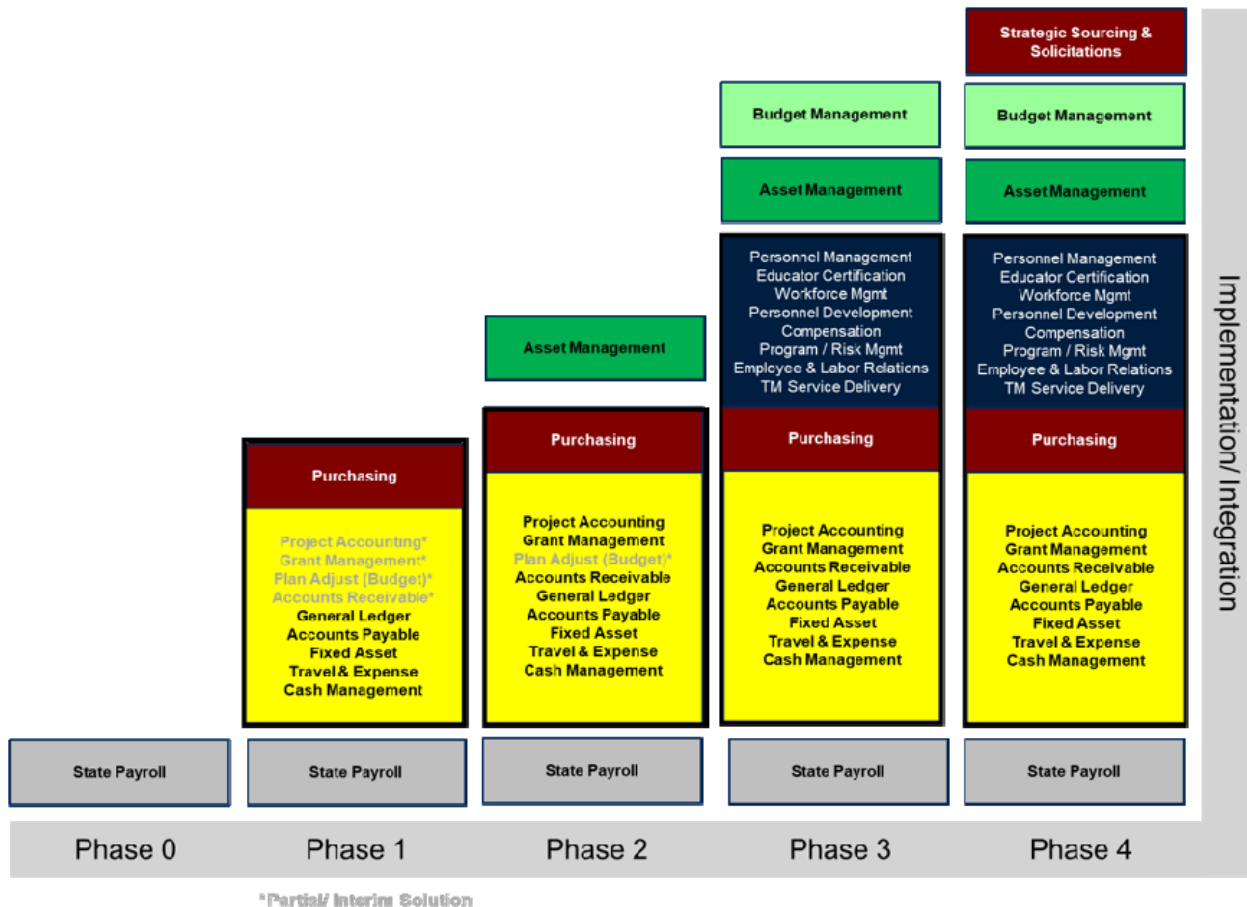


Figure 2. ERP Roadmap (Sample Conceptual View)

Acquisition Objective & Anticipated Benefits

The Department's objectives for this acquisition are therefore twofold: address the near-term replacement of FMS while also making material progress on the longer-term strategy for ERP modernization.

Acquisition objectives for the near-term FMS modernization include the following:

- Primary objective: Complete the FMS modernization as quickly as possible with an approach that minimizes risk (e.g., minimize business transformation and the introduction of new functionality).
- Secondary objective: Complete the FMS modernization as a pilot project in the context of the Department's longer-term ERP Modernization Framework (e.g., make configuration decisions on the current FMS modernization project considering potential downstream impacts in later ERP modernization phases).

The Department understands that it may not be possible to fully optimize both primary and secondary objectives for the FMS modernization project. The Department intends to use this acquisition process to clarify its understanding of potential trade-offs between objectives and to enable a more informed acquisition decision.

The Department expects to realize the following benefits with the modernization of its current FMS system:

- Improved access to accurate, timely, and meaningful fiscal data for all stakeholders—both internal and external to the Department’s organization—for the ultimate purpose of enhancing student achievement and creating life-long learners.
- Enhanced efficiency and effectiveness of technology support to schools, offices, and administration with the implementation of a solution aimed at modernizing and automating workflows, improving data quality, and decreasing administrative burden (e.g., eliminating double entry due to disparate data systems).
- Expanded access to complete and consolidated information, that’s up to date in real-time, that will enable users at all levels of the organization to work together collaboratively to support data-driven decisions.
- Reduced administrative burden on our staff and supplier partners through the introduction of easy to use self-service tools, web-based portals, and mobile capabilities.

Acquisition Approach & Timeline

As defined in the NASPO Cloud Solutions Master Agreement, the Department has the flexibility to compete vendors against one another informally using the requirements defined within our Acquisition Package prior to initiating a formal solicitation of quotes for contracting. Therefore, the Department is using a two-step process for acquisition.

In the first step, the Department is using an informal competition to select the software solution that will best fit Department’s requirements, to clarify the licensing included in the formal request-for-quote, and to begin to negotiate most favorable pricing. This informal first step is initiated with the release of the Acquisition Package to a targeted set of NASPO Cloud Solutions providers. During this informal phase, targeted NASPO Cloud Solutions providers may submit multiple draft quotes (i.e., with different software solutions, sub-contractor delivery partners, etc.). The Department is informally evaluating written responses and in-person software demonstrations.

Based on the outcome of this informal process, the Department is updating and finalizing the Acquisition Package, and then re-release the Acquisition Package as a formal NASPO ValuePoint Cloud Solution Task Order. Vendors will then have an opportunity to right-size their draft bids to best align with the Department's requirements.

Evaluation Approach

A target timeline for the acquisition of the FMS modernization is presented in the figure below.

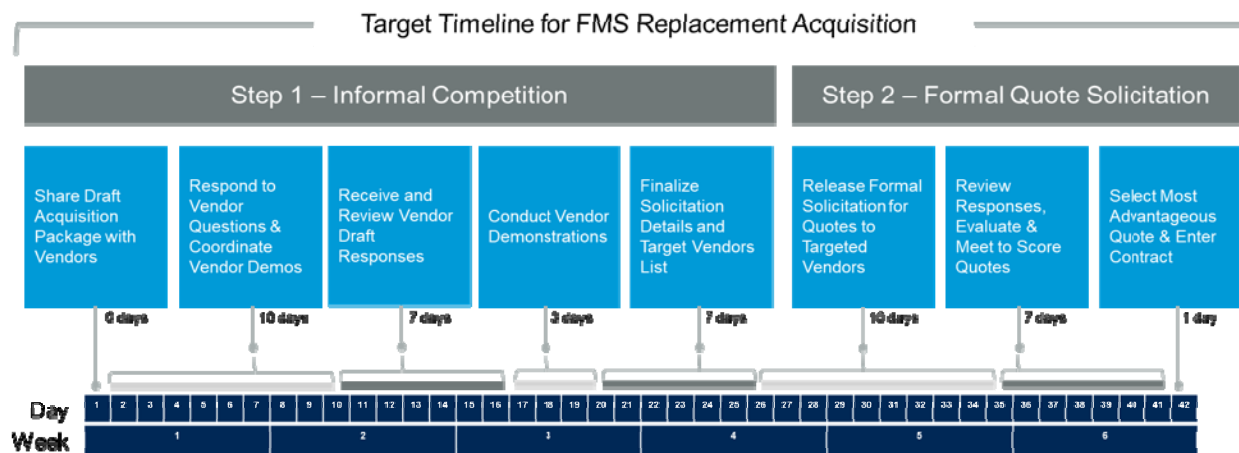


Figure 3. Evaluation Approach

Evaluation Criteria

The selection of the software solution for formal solicitation, and ultimately the selection of the best value task order response for both software and services combined, will be focused on bidders' (and their solution and delivery partners) ability to meet the explicit requirements. However, other things equal, the Department prefers taking the approach that best aligns with the Department's longer-term ERP modernization strategy.

- **Informal Competition: Selection of Software Solution**

The Department will consider the following criteria when making the software selection:

- Minimum Qualifications
- Fit to Requirements
- Demonstrations
- References
- Cost

- **Task Order Solicitation: Selection of Best Value NASPO Task Order Quote**

The Department will consider the following criteria when making the selection of the best combined software and services proposal:

- Submittal Compliance
- Minimum Qualifications
- Demonstrated Understanding of the Department's Requirements
- Statement of Work Approach
- Response to Scenarios
- Implementation Approach
- References
- Cost

I. FINANCIAL IMPACT

RFI from 12 solution providers obtained by the Department in April 2019 produced rough-order-of-magnitude (ROM) estimate of \$10M for the initial year and an annual recurring cost of \$3M. NASPO ValuePoint Cloud Solutions contract vehicle will allow the Department to seek competitive bids from preapproved software and service providers.

II. COMMUNITY OR PUBLIC ENGAGEMENT

The Department has formed an Executive Steering Committee, chaired by the Superintendent, comprising key members of highly impacted State Agencies. Membership from the Department includes leadership from OITS, OFS, OFO, OTM, and Complex Areas. Membership from other State Agencies include the Comptroller, the State CIO and head of ETS, and the CIO of the University of Hawaii System.

Once procurement is awarded, the Department plans to inform all relevant stakeholders of the award. A workgroup focused on communication is refining a full communication plan which will include all aspects of our tri-level organization. The communication plan will also include other key stakeholders, including the Board of Education, Legislature, other State Agencies [including DAGS, ETS, and Budget and Finance (B&F)], and other community stakeholders.

Communication will continue past the award notification. It will include timely updates on implementation status. More importantly, it will include substantial training on the new solution for users. We also anticipate it will include training for other stakeholders to explain the new and improved financial reporting we anticipate as part of the new solution.

The Department has begun community engagement by informing Transform Hawai'i Government (THG <https://www.transformhawaii.gov/>) of the Department's overall plans. Christine Sakuda, Executive Director of THG, has been the key contact point. We anticipate interest from other community groups, and are reflecting that in the development

of the communications plans. The Department's Labor Relations team will engage unions whose members may be impacted when the award is finalized and the scope of changes is concrete.

III. ANALYSIS OF OPTIONS

Justification:

1. What is the need?

We are replacing the incumbent FMS. FMS development started in 1988 and became the Department's financial system of record in 1991, 28 years ago. We need to pay for the ongoing software licenses and professional services in support of the replacement.

The Department is behind the K-12 and public sector market with regard to updating technical solutions.

- Many large school districts completed ERP modernization initiatives during the 2000s and early 2010s leveraging large premise-based ERP package solutions – SAP, Oracle, PeopleSoft, Lawson (Infor) .
- Cloud native software solutions (SaaS solutions) have been more widely rolled out in higher education institutions, and non-profit charter systems, including for finance system replacements.
- Large K-12 public school districts have been implementing HR cloud-based systems for almost a decade, a few have implemented cloud-based financial system replacements.
- Mid-sized school districts also implemented these solutions, as well as competing Tyler Technologies solutions that are popular in the smaller tier markets.
- School districts are now beginning to implement cloud-based finance solutions, with Oracle Cloud recently winning two major contracts for large districts, and Workday implementing its cloud-based financial system in several mid-sized/smaller districts (following an early failure when first entering the market in the Sacramento City Unified School District around 2015).
- SAP is also attempting to enter the K-12 space, and Broward County recently entered an agreement to migrate to a cloud hosted version of the current SAP solution, HANA. Miami-Dade County is evaluating a potential upgrade to a multi-tenant SaaS version of HANA.

2. What is the proposed solution?

The Department is seeking to acquire a fully integrated modern Core Financial Management Solution that will fully replace existing functionality in the Department's current FMS and may provide a limited amount of new and/or improved functionality.

The Department intends to acquire a complete solution consisting of software, related cloud hosting and support services.

Purchasing a modern, COTS software product, hosted by a Software-as-a-Service (SaaS) provider, leveraging a product used by Fortune-500 scale companies and organizations will provide the Department a robust, proven, and tested solution. The new solution will mitigate the risk of unsupported software which lead to the outage in October 2018. A large number of customers use these SaaS solutions. The Department has positive experience working with SaaS vendors for our comprehensive Student Information System. Having this broader community of users exposes issues or bugs in the system much earlier than only having one customer such as the Department. The more extensive collection of customers also distributes the expense of correcting issues across all customers and not just the Department. This SaaS platform also provides a much more natural means of making continuous improvements to the software as there is no software to be installed on end-user computers or other Department systems to enable the upgrade. Moving to a modern financial platform with advanced tools will allow the Department to provide:

- Improved access to accurate, timely, and meaningful fiscal data for all stakeholders — both internal and external to the Department's organization.
 - Enhanced efficiency and effectiveness of technology support to schools, offices, and administration with the implementation of a solution aimed at modernizing and automating workflows, improving data quality, and decreasing administrative burden (e.g., eliminating double entry due to disparate data systems).
 - Expanded access to complete and consolidated information, that's up to date in real time, that will enable users at all levels of the organization to work together collaboratively to support data-driven decisions.
 - Reduced administrative burden on our staff and supplier partners through the introduction of easy to use self-service tools, web-based portals, and mobile capabilities.
 - Improved financial reporting, giving detail drill-down and up-to-the-minute data, improved fiscal transparency and fidelity, provide more self-service tools letting schools drive needs.
3. What amounts of funding and resources are already being used to address this need?
- The Department has looked into the existing centralized costs associated with the current FMS system. IBM has been providing ongoing support for Db2 for z/OS V10 which started May 2019 and ending April 2020. The cost was ~\$58K. Utilities, tools and other license support and renewal cost is ~\$7,000. There have been no other direct/hard-costs identified for expenses such as system development. The Department has determined that the cost of operating the current FMS is largely borne by the Department's staff and end-users, meaning the schools and offices that must perform

their business transactions through the current system with its short-comings and manual work-arounds. As such, there are no general funds in the Department's budget that could be readily repurposed to meet anticipated costs associated with

- the acquisition or
- the annual license/maintenance of the new financial management system.

Given the critical nature of FMS as the system of record for HIDOE finances, the limitations of the system, and the urgency is driven by its inherent and demonstrated unreliability:

- to meet the significant initial costs associated with the acquisition, the Department is looking to obligate federal indirect overhead reimbursements received by the Department pursuant to Hawaii Revised Statute Section 29-25, and
- to meet the annual licensing/maintenance of the new financial system the Department has prepared a Fiscal Year 2020-21 Supplemental Budget Request for additional general funds, which was presented and approved by the Board of Education in October 2019. B&F has reviewed the request for the annual costs and will recommend \$2.935 million of \$3 million requested for the FMS modernization licensing costs to the Governor.

4. What resources are required for the proposed solution?

Funding will be needed for acquisition of a new solution, as well as for implementation and recurring costs (annual software licenses, hosting, support services, and professional services). In addition, there will be a need for the Department staff (Subject Matter Experts) time for implementation of the new system; temporary staff will need to be hired/contracted to backfill the day-to-day/operational activities the Department staff would typically perform while they are working on the FMS modernization project.

5. Describe how successful outcomes will be measured. What measurable or observable evidence would indicate the extent to which the proposed solution "works?"

This project will be a success when we have a replacement FMS system which is a commercial off the shelf software product, hosted by a Software-as-a-Service provider, which fulfills the business capabilities which are provided by the incumbent FMS.

6. Identify feasible alternatives?

There are four (4) alternative options to replacing the incumbent FMS.

Summary of the four options:

1. Status quo
2. Move existing FMS to IBM MFaaS
3. Replace incumbent FMS with minimum viable product without the IBM Mainframe

4. Combine option 2 and option 3: Move FMS to IBM MFaaS and then implement FMS SaaS

What follows are more detailed description of the above four options?

Option 1: Continue to operate FMS as is. This was proven to be a failed approach in October 2018 when the system crashed; it took three weeks to restore functionality to the system. The vendor, IBM, no longer supports the software which is required to run FMS. Personnel with the expertise to support the ETS mainframe environment as well as the software supporting FMS are starting to retire. This skill is not able to be found in the market place today. Maintaining the status quo is no longer a viable option.

Option 2: With recent advancements in cloud-based technologies, ETS is embracing the opportunity to transition to a mainframe cloud solution also known as a Mainframe as a Service (MFaaS).

MFaaS is a subscription service that addresses legacy mainframe challenges while providing scalability and flexible financial models to support growth. MFaaS allows operators to scale mainframe capacity to be in alignment with organization's unique requirements.

Cloud-based advantages

Migration to the new MFaaS model provides ETS with the following immediate, statewide benefits:

- Sustainable and dynamic – The MFaaS solution allows ETS to move away from the physical legacy mainframe, located in the Kalanimoku Building. ETS is planning to run applications and services within the IBM cloud-based MFaaS. This change allows ETS to replace end of life hardware, making the mainframe environment more dynamically sustainable and provides the opportunity to extend the lifespan of mission-critical applications.
- Security – The IBM MFaaS solution runs within a Tier-4 Data Center, providing ETS an environment to run mainframe applications with the highest level of redundancy and security. This Tier-4 Data Center also offers options not available within current onsite mainframe environment. *A Tier 4 data center is an enterprise class data center tier with redundant and dual-powered instances of servers, storage, network links and power cooling equipment. It is the most advanced type of data center tier, where redundancy is applied across the entire data center computing and non-computing infrastructure.*
- Recovery – The IBM MFaaS cloud solution provides ETS additional disaster recovery options to ensure business continuity. The ETS MFaaS infrastructure

will have a primary Tier 4 data center in Nebraska and a Disaster Recovery Tier 4 data center in Illinois.

- No major conversion – The MFaaS model migration requires no major conversion efforts, thus maintaining critical business continuity during the migration. ETS will test the cloud-based service by running live mainframe applications, both on the on-site mainframe and the new cloud-based mainframe, to confirm all processes run identically prior to the final transition. Once all processes are confirmed, migration to the cloud will proceed, and ETS will retire the onsite mainframe.
- The Department has been invited to participate in this verification testing effort. ETS is planning on retiring the onsite mainframe on June 1, 2020. If the Department does not participate not only will the onsite mainframe not be available but the Department will not have verified FMS in the MFaaS environment.

ETS has expressed their desire to move the existing applications currently hosted on their leased IBM mainframe hardware which is running the Z Operating System (IBM z/OS) to IBM's new service "Cloud Managed Services on z Systems." IBM's claim is this offers the ability to run mission-critical workloads in a cloud environment. This is a potential option to HDOE but it is not without risk.

1. Replicating the existing FMS infrastructure into IBM's MFaaS environment will need to be performed perfectly to ensure this system continues to operate properly for the Department. There are over 3,000 COBOL programs which support the incumbent FMS. These would need to be tested and verified as working as expected in the MFaaS environment. The personnel with the skills to perform this work would need to verify the MFaaS environment in addition to their current production operations and maintenance work. This MFaaS verification effort is currently scheduled at the same time as the FMS replacement effort which will place three major efforts on the same Department staff. Currently, their existing volume of work requires the staff to go into overtime.
2. IBM claims they have the ability to run the mainframe applications in their MFaaS environment using the Department's current versions of the software. This will need to be proven to be true. There is no known duration for how long the Department will be allowed to run on this "down level" software. If the Department is forced to upgrade the underlying software at a future date, this will prove to be complicated and expensive.
3. The current FMS software has configured the connections to supporting boundary systems with hard-coded IP addresses. If any of the IP addresses

need to be changed in support of the move from ETS mainframe to IBM MFaaS, this will require additional work and verification testing.

4. The end result of an upgrade of the “down level” software exercise would be a system which runs and operates like a program built in 1988 but on new software tools. This may be an exciting adventure for a software-historian much like a car enthusiast rebuilding a classic car. The unfortunate truth is that the Department would end up running our enterprise systems using, in computing terms, ancient logic and methods. We need to modernize our standards and practices to be able to provide services in the 21st century which many consider “table stakes.” The approach of updating our current technology would result in a suboptimal solution without removing any of the risks of lack of skills and lack of modern services from the incumbent FMS.

Option 3: The Department should replace the incumbent solution with a modern financial management solution prior to ETS decommissioning of the existing IBM mainframe. The Department is currently in the process (August 2019 - July 2020) of procuring and implementing the FMS modernization system given the extreme risk of continuing to operate the current FMS. This would require the Department to have a functional solution in May 2020.

To meet this date, the Department will implement a basic system replacement only, with little to no new/added functionality or features. This will be a “lifeboat,” a minimally viable product solution which will enable the Department to switch over to in the event of a catastrophic failure of the incumbent FMS. The lifeboat will include a subset of the primary software solution areas, capability groups and functions shown below in **Figure 1** and also as a separate attachment. To reiterate, the “lifeboat” is only a partial implementation of the entire COTS SaaS product to keep the Department from having to revert back to manual financial procedures which were implemented during the October 2018 outage. The full replacement functionality as depicted in **Figure 1** would be implemented at a later date.

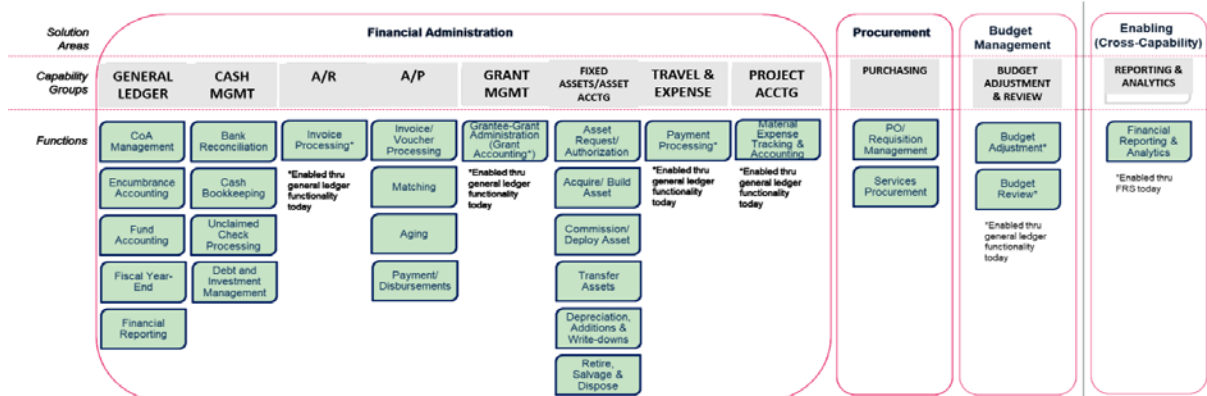


Figure 4: Acquisition Scope: Solution Areas, Capability Groups, and Functions

The exact lifeboat functions will be identified by business and technical subject matter experts. After July 1, 2020, if the incumbent FMS is still viable, then it will continue to be used while the new FMS is built out with additional functionality, benefits, and efficiencies to be gained from further configuration of the new system. Then, transition to the new FMS will occur. A cutover plan will also be developed by business and technical SMEs to ensure continuity of services and operations for the Department.

Option 4: Use an approach of option two and option three. Participate in ETS' and IBM's MFaaS effort to replicate the incumbent FMS into IBM's infrastructure. Once the replication completes, then engage a team of the Department subject matter experts to verify the current functionality provided by FMS continues to operate as expected in this new environment. With the completed verification testing, then initiate in earnest the program to engage with the NASPO SI to replace the incumbent financial system with the SaaS postmodern financial management system. This fourth option may allow the Department to operate the incumbent FMS software in an environment with enhanced operational and maintenance support. The new environment also provides a secondary disaster recovery environment (which needs to be proven to be viable by ETS and IBM) for some time longer than is available to the Department today on the existing leased mainframe. ETS has shared their plans to decommission the existing IBM mainframe in the May/June 2020 timeframe. Having this extended time will provide both the Department and the NASPO SI more time to configure the SaaS system without the intense urgency of the May/June 2020 timeframe.

7. What would be the consequences of doing nothing?

Maintaining the status quo is no longer a possibility beyond the first half of calendar year 2020. The software infrastructure hosted by ETS is no longer supported. ETS is not going to renew their lease on the IBM Mainframe located in the Kalanimoku Building. This equipment will be decommissioned and the leases will be terminated (both hardware and facility). It is not possible to continue to run the current version of FMS in the ETS environment as it will no longer exist in its present state.

Next Steps

The FMS modernization team plans to proceed on a combination of parallel tasks:

- Continue with the NASPO Cloud Solutions acquisition for a hosted/SaaS product and professional services for the system integration company.
- Participate with ETS in the move to IBM's MFaaS. This includes but is not limited to:
 - participating in the project meetings,
 - participating and/or developing the test plans to be performed to verify FMS on MFaaS is functional,
 - executing the verification test plans, and

- documenting the results of the test plans with an expectation that IBM will work on resolving any issues identified which are not due to FMS software, and verifying all FMS boundary systems (e.g. FRS, Banks, IRS, etc.) are functional.

BC:bf

c: Alison Kunishige, BOE
Kenyon Tam, BOE
Regina Pascua, BOE
Irina Dana, BOE