**KPMG**

The School Board of Miami-Dade County, Florida

Final Report –

Oversight Services for ERP Implementation (BOSS)

October 24, 2008

KPMG LLP

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# 1       Executive Summary

## 1.1      Project Background

Miami-Dade County Public Schools ("M-DCPS"), the fourth largest school district in the United States, is currently in the process of implementing the SAP Business Suite for many of the District's administrative functions. The School Board of M-DCPS ("Board") initially approved the project on December 14, 2005 as a part of the District's Comprehensive Information Technology Blueprint. This District-wide business transformation project—widely know as BOSS: Business Operating Solutions for Schools—is implementing SAP's Enterprise Resource Planning (ERP) technology to redefine business processes, increase efficiency, and enable M-DCPS to reallocate resources from administrative functions to schools and to serve students.

M-DCPS is a very large and complex organization with an annual budget of over $6 billion and more than 50,000 employees, serving over 340,000 students at 850 work locations. Business transformation projects in organizations of this size and complexity are challenging, and M-DCPS' current BOSS implementation has encountered such challenges.

In the first quarter of 2008, scope reductions occurred with the removal of Project Systems and Travel Management modules. Components of the Controlling module and internal funds functionality were also scaled back. Additionally, on June 25, 2008, the BOSS project presented the School Board with Agenda Item (SP-1), requesting the approval and authorization for further modifications in project scope and a reduction-in-force of BOSS project personnel.

The original scope of the BOSS project included the implementation of SAP's Finance, Human Resources, Payroll, and Procurement modules organized into three releases, as documented in the Project Charter, dated January 20, 2008:

- **Release 1 Finance and Procurement** (scheduled go-live January 2009) – included General Ledger, Funds Management, Budget, AP/AR, Grants, Controlling, Project Systems, Supplier Relationship Management, Procurement, Materials Management, Business Performance Reporting, Procurement Card, Cash and Capital Management, and Budget Control.
- **Release 2 Human Resources/Payroll** (scheduled go-live July 2009) – included Personnel Administration, Organization Management, eRecruitment, Payroll, Time and Attendance, Benefits Administration, Employee Self Service, Compensation Management, and Payroll and Legal Reporting.

- **Release 3 Supply Chain and Travel** (scheduled go-live July 2009) – included Travel Management, Contract Management, Inventory Management, Sourcing Contracts, Supply Data Management, and Business Performance Reporting.

The project scope change addressed in SP-1 removed the following Financial components from the scope of BOSS:
- General Ledger (partial) and Grants
- Funds Management
- Accounts Payable (AP) and Accounts Receivable (AR)
- Controlling
- Fixed Assets
- Cash and Capital Management
- Budget Control
- Procurement Card
- Business Performance Reporting (partial)

SP-1 also realigned the Release 3 implementation schedule. While the Finance scope was significantly reduced, the Procurement Release 3 was accelerated from the original July 2009 go-live date to April 2009. The July 2009 go-live dates for Release 2, Human Resources/Payroll remained unchanged.

In light of these project changes and recommendations from external auditors, M-DCPS requested KPMG to perform an objective project assessment to help M-DCPS determine the current status and recommend alternative courses of action for the BOSS project, if needed.

## 1.2    Objectives, Scope, and Approach

Large complex business transformation projects that are subject to periodic third party project assessments from the outset achieve a higher success rate than projects that are not. For projects that are experiencing delays and cost overruns, an assessment can provide recommendations for adjustments in the implementation roadmap and recovery options that can help mitigate project cost and schedule risks.

Beginning on August 25, 2008, KPMG assessed the current state of the BOSS implementation as defined in the Services Agreement dated July 15, 2008 and executed on August 15, 2008 between M-DCPS and KPMG.

This report is the Final Assessment Report and includes observations, recommended actions for key risks and issues from the beginning of our fieldwork on August 25, 2008 through October 17, 2008.

Financial data and project schedule inputs included in this report are generally through September 30, 2008, unless otherwise noted.

## 1.3    Summary of Key Findings

KPMG's BOSS Assessment Report identifies project improvement opportunities, risks and conditions that require District attention to improve the likelihood of a successful implementation that is completed on or close to currently revised schedule and budget.  Below are the key findings.  Further detail for these findings and additional findings and recommendations are presented in Sections 2 – 5 below.

A.  <u>The BOSS Project is at risk of cost and schedule overruns</u>.  As of the date of this report, KPMG estimates that the project is approximately four weeks behind schedule with the likelihood for further delays to occur in development, principally because:

 • The removal of the SAP Finance Modules as documented in the SP-1 project change order, required that a number of Financial and Procurement business processes continue to be performed in the District's Legacy MSA system, which would have otherwise been retired and replaced by SAP.

 • SP-1 shifted project scope from the BOSS SAP Financial and Procurement Team (mostly disbanded in July 2008) to the M-DCPS Information Technology Services (ITS) organization.

 • The extent of the work required from ITS was significantly underestimated in the original BOSS plan and time line.

KPMG considers the ITS resource constraint and the additional complexity of maintaining both MSA and SAP operating successfully, in a synchronized manner, to be the highest risk to the District and to the BOSS project cost and schedule.

B.  <u>KPMG has not identified conditions that would warrant canceling the BOSS project</u>.  KPMG does recommend that the BOSS PMO investigate alternative implementation strategies to enable the District to maintain the project on schedule, as described in Sections 1.4 and 5.

**1.4    Summary of Key Recommendations**

A. <u>The BOSS PMO, working with ITS, should develop a realistic schedule for the development of the legacy system interfaces</u>.  Unrealistic target dates create the risk that the quality documentation and sufficiency of testing of BOSS system components may be compromised.

B. <u>The BOSS PMO should consider alternatives to the current development and deployment plans</u>.   KPMG recommends, as the preferred option, that the BOSS team consider placing MSA legacy system updates (not interfaces or updates in support of an interface) on a separate time line from the SAP HR/Payroll and Procurement development, testing, and training schedule.  ITS can upgrade the MSA legacy environment and test it independently.  This approach will minimize the District's exposure to additional Deloitte consulting fees.

   Two other alternatives, which would likely generate increased cost and possible project delays, but may be necessary for a successful implementation, are discussed in section 5.1.1.

C. <u>Maintaining MSA to manage the District's financial operations should be considered a short term solution</u>.  The risk caused by the potential failure points in business processes that are supported by complex, overlapping systems is extremely high.  M-DCPS should re-start the implementation of SAP Financials as soon as possible.

## 2        Project Financials and Schedule Assessment

KPMG obtained BOSS project financial records and work plans to assess the project's financials and timeline. In addition, KPMG assessed the impact of terminating the project should M-DCPS decide not to proceed further with the BOSS project.

### 2.1      Project Financials

KPMG's assessment of project financials is based on the review of BOSS project financial records, including budget plans and expenditure reports.

Our findings include:

- **Deloitte's invoicing schedule is in line with its planned personnel deployment and is not necessarily tied to the value created by each deliverable to the District.  Invoicing based on value created is typical in a true fixed fee contract.**

  KPMG's interpretation of M-DCPS' intent in entering a fixed fee contract for implementation services is that the District was seeking to transfer much, if not all, the risk of project delay to Deloitte.  However, the agreed invoice schedule negotiated in the Deloitte Statement of Work (SOW) aligns invoice payments with consulting effort expended, which is then attributed to project deliverables, not to value created.  SP-1 does not reconcile the cost attributed to the deliverables in the original Deloitte SOW and the cost of the same deliverables in SP-1.

  This negotiated billing approach, as planned, favors Deloitte over the District as illustrated in the chart prepared by KPMG below.

  The graph below charts four key project financial elements from inception to the planned end of the BOSS project in August 2009:

  1. Deloitte Cumulative Full-Time Equivalent (FTE) Resource Plan *(Cum FTE Plan)*.  This line represents the cumulative SP-1 adjusted Deloitte Full-Time Employee (FTE) Resource Plan, charted, in U.S. Dollars, at average rate per hour for Deloitte consultants deployed each month.
  2. Cumulative Deloitte Invoicing Plan per SP-1 *(Cum SP-1 Invoice Plan)*. This line represents the SP-1 Invoice Schedule – The schedule of cumulative *planned* invoice payments for the corresponding schedule of deliverables.

3. Cumulative Actual Deloitte Invoices *(Cum Actual Invoices)*. This line represents the amount of the Deloitte invoices and corresponding deliverables submitted for review, approval and payment.
4. Cumulative Actual Deloitte Invoices minus Holdbacks *(Cum Actual Invoices with Holdbacks)*. This line represents the value of the Deloitte invoices submitted for review, approval and payment, less the contract holdback amounts.

**Deloitte SP1 Resource Plan**
**SP1 Appendix E Invoice Schedule**
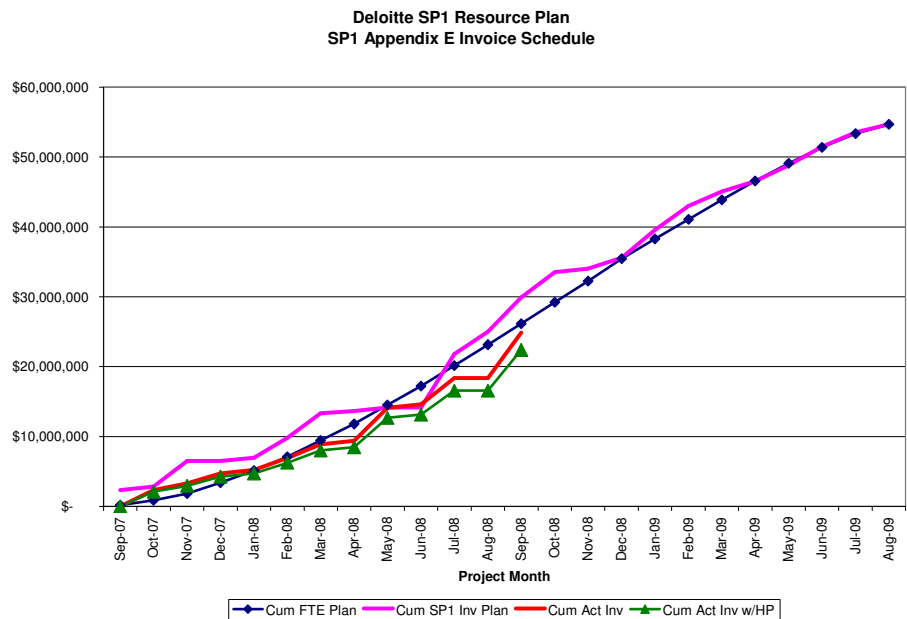


From this chart we draw the following conclusions:

o The negotiated SP-1 invoice schedule tracks to the Deloitte's project resource cost/cash flow profile.
o Based on the projection, if the project remains on schedule, Deloitte invoices for deliverables at a rate faster than the cost of resources it deploys, coming into balance at project end. This approach generates a buffer for Deloitte that may assure that it will be ahead in the event of a project cancellation for convenience by the District.
o Through September 30, 2008 actual project deliverables and the corresponding invoice submittal are behind the SP-1 SOW Appendix E invoice schedule. By contract Deloitte, should have completed deliverables that totaled $29,900,000. The amount invoiced through September 30, 2008 for deliverables reviewed, approved and signed off by the District totals $25,100,000, or $22,565,000 after deducting contract holdbacks.

- **SP-1 Net Cost Reduction Analysis: SP-1 both reduced and *increased* scope.**

  The project scope changes included in SP-1 resulted in a net reduction of $2 million to the Deloitte consulting contract. The contract reduction reflected approximately $4.3 million in resource reductions attributed to the removal of the SAP Finance Modules from the project scope. On the other hand, the Deloitte contract was increased by approximately $2.3 million of additional HR/Payroll development objects and additional Deloitte resources to assist with training material development and development of functional specifications, tasks that were originally planned to be performed principally by District resources.

- **The BOSS project budget reflects a portion of the cost of implementing SAP, not a true "total cost of ownership" as referred to in project communications.**

  The traditional definition of 'Total Cost of Ownership' (TCO) is the present value of the acquisition, implementation and internal and external costs for system maintenance and support for the full life of the system.

  The existing BOSS budget of $85.4 million does not account for future staff and maintenance costs. Furthermore, the project budget does not account for the following expenditures that may have been, or will be paid by the District's General Fund:

  - Time and cost already incurred by District personnel involved with requirement and design sessions.
  - Future time and cost of District personnel involved in data cleansing, integration testing, end user training, change agent activities.
  - ITS resources working on BOSS-related tasks but not assigned to the BOSS project.
  - Costs of personnel who will provide post-production support.
  - Post production hardware and software maintenance costs.

  True TCO cannot be calculated with any great degree of confidence at this stage given that many activities have and will occur using District resources with no means of capturing time (labor cost) separate from their normal job duties.

- **Prior to SP-1, the BOSS project was experiencing overruns of over $1 million and had tapped into project contingency funds for costs over $244,000.**

  The BOSS project budget was allocated for each year of the project, by school year, up to its completion in August 2009. In the June 30, 2008 BOSS expenditure report for the 2007-2008 year, cost overruns approximating $1 million were observed in the areas of staffing/location internal costs and software maintenance. $244,000 contingency fund usage in the 2007-2008 school year is attributed to Region III School Expenditures at Miami Springs High School where the BOSS project team is located.

  The BOSS project team and ITS expect to expend contingency funds in the following areas:

  - ABAP/Portal development and ITS consultants
  - Staff overtime (ITS/network/technical services/other support staff)
  - SAP/VMWare professional services
  - Storage (hard disk) space and servers based on the results of load and stress testing

- **An agreed scope reduction was not approved in writing by the former Project Sponsor.**

  In the first quarter of 2008, a significant scope reduction was agreed to with Deloitte, removing the Project Systems and Travel Management modules from the BOSS scope. Components of the Controlling module and internal funds functionality were also scaled back.  A change order was prepared by Deloitte but was never signed by the former Project Sponsor.  These SAP modules might otherwise have been listed in the SP–1 change order, but were not.

KPMG also noted the following observations regarding the BOSS invoicing:

- A net $150,000 credit (including holdback) is due to the District, as a result of incorrect invoicing on three deliverables.

- All deliverables reviewed by KPMG were appropriately signed-off by District and Deloitte team leads and the PMO before invoicing by Deloitte.

## 2.2 Schedule Assessment

KPMG's schedule assessment is based on our review of project work plans and completion trends for specific deliverables, including:

- IMG documents,
- FRICE-W functional specifications,
- Execution of unit testing,
- Completion of Business Process Procedures (BPPs), and
- Changes to Legacy systems to be performed by ITS

Our findings are:

- **KPMG estimates the BOSS project to be approximately four weeks behind schedule, with risk of further delays.**

  As of October 2, 2008, we estimate that the BOSS Project is four weeks behind schedule. This is driven primarily by the late completion of project functional specifications, and the resolution of open issues pertaining to the legacy system interfaces, agreed to level of effort estimates to complete development, and the availability and assignment of ITS resources.  KPMG reviewed the draft version of the ITS project plan for BOSS-related development activities, and notes that BOSS leadership plans to work within the current project time lines and recover the four week delay.

  As of October 2, 2008, several scorecard items were behind schedule, as indicated in the table below.  The net effect of the delays, based on KPMG's projections, is an estimated delay of 4 weeks for the over-all BOSS project.

| Scorecard Element | 10/2/08 Status | KPMG Estimate to Complete * |
|---|---|---|
| IMG Configuration | 205 items are late | N/A** |
| FRICE-W Functional Specs | 194 of 328 completed | 10/31/2008 |
| Unit Testing | 344 of 767 completed | 11/07/2008 |
| BPPs | 204 of 767 signed off | 11/03/2008 |

\* Refer to **Appendix D** for details on how KPMG calculated estimate to complete

\*\* Data not available for KPMG to estimate completion

Definitions of the above terms are:

- The IMG Configuration items are the district's SAP configuration tasks that are performed using SAP's Solution Manager tool.

- The FRICE-W database is the repository that tracks the project's development objects including:
  - **F**orms,
  - **R**eports,
  - **I**nterfaces,
  - **C**onversions,
  - **E**nhancements, and
  - **W**ork flow.

- Functional Specifications document the business requirements to be addressed by the FRICE-W items.
- Unit Testing tracks the testing of those SAP standard transactions that are in scope for the BOSS project and FRICE-W objects.
- BPPs (Business Process Procedures) provide the detailed steps for executing key SAP or BW (Business Warehouse) transactions. BPPs are the source documents for most end user training documentation.

In addition to these existing delays, KPMG anticipates the delays may not be recovered through the development phase alone. KPMG's assessment is based on the status of development objects (FRICE-W) scheduled to be in development as of October 17, 2008:

- There are 104 items behind their scheduled start date (107 started vs. 211 scheduled to start)
- There are 44 items behind their scheduled completion date (53 completed vs. 97 scheduled to be completed)

Approximately 51% (107/211) of development items started late, presumably due to delays in providing functional specifications to the developers. Approximately 54% (53/97) of the objects scheduled to be completed are currently late. Given that the percentages are similar, development is not extending the delay nor has it shown signs of helping recover from the delay either.

Furthermore, the risk of additional delays is increased by the large work load of ITS development. The work effort and scheduling for legacy systems interfaces and data conversion program development was underestimated from the inception of the project. The tasks were estimated at 480 days (six FTE's for eight weeks) in the original BOSS project plan developed without input from ITS. Based on input from ITS, the original estimate should have been scheduled and budgeted for 1,050 days. Changes in scope resulting from the SP-1 decision, increased the ITS work load further by an estimated 600 days of work on legacy systems, mostly MSAF. This reflects an increase of over 200% from the original estimate.

- **Schedule delays pose a risk of abbreviated testing in order to meet the deadline.**

  The BOSS project team is considering options for development schedule recovery, including overlapping development activities with system and integration testing. KPMG views this approach as a compression of the testing timeline and represents a high risk approach.

  Delays in writing functional specifications and in completing required legacy system interfaces could put additional strain on Deloitte's off-shore resources to generate code for a large number of objects in a short amount of time. Delays caused by poor or rushed off-shore development may not manifest itself until integration testing.

## 3       Deliverables and Knowledge Transfer Assessment

KPMG assessed a selection of BOSS deliverables and scorecards for timeliness, completeness, and acceptance by appropriate District and Deloitte personnel. In addition, KPMG assessed the BOSS project knowledge transfer plan and progress against the plan.

Our findings include:

- **Deliverables were appropriately reviewed and signed off per the BOSS project's acceptance criteria prior to invoicing.**

- **BOSS project metrics and progress reporting is accurate and timely but reports only on the progress of the dedicated BOSS team.**

  Scorecards used by the project to track and measure progress against key metrics were assessed and found to be reliable and accurately reflect the BOSS project team's progress.  However, they do not incorporate critical tasks assigned to non-BOSS resources, such as ITS, and thus do not provide an overall view or status for the project.

- **Deliverables are not completed on time.**

  Only 25% of the deliverables were completed within a timely manner (even after allowing a three-day grace period). The remaining 75% of deliverables were completed 10 to 58 workdays late. The delays to date do not appear to impact the overall go-live date.

  For example, the October to December 2008 Communication Plan quarterly update was not completed by the September 3, 2008 due date because it is pending final approval of the Change Agent approach for school sites.

- **Knowledge transfer assessments of BOSS team members have not been performed to date.**

  Contrary to the documented *Knowledge Transfer Strategy*, knowledge transfer and skills assessments will be performed as part of the BOSS employee's annual goal setting and evaluation process.  The *Knowledge Transfer Strategy* specified that BOSS employee evaluations would be performed by Deloitte resources.  However, that responsibility has been assumed by District BOSS team leads.  This change reduces Deloitte's accountability for appropriate knowledge transfer.

KPMG recommends that knowledge transfer assessments take place periodically at various points of the project lifecycle to ensure the expected transfer of knowledge between Deloitte and BOSS project resources occurs.

- **Key knowledge transfer and training strategy documents have been finalized and approved but have not updated.**

  The *Knowledge Transfer Strategy* has not been updated to document the revised plans to assess knowledge transfer by M-DCPS team leads, not Deloitte.

  Critical project changes, such as SP-1, which occurred after the *Project Team Training Strategy* was documented in October, 2007, have not been updated to reflect how the scope affects the BOSS team training needs.

  Interviews of selected District BOSS team members indicated that the training received to be adequate and reasonably aligned with learning paths set for their position.

## 4        Testing / Quality Assurance

KPMG's assessment of BOSS' testing and quality assurance process--which as of the date of this report is in the planning phase--is based on the review of Deloitte's deliverable #34, the document titled *Test Strategy*.

KPMG also reviewed configuration and functional unit test progress to-date. The results of this review are captured in Section 2, Financials and Schedule Assessment.

The *Test Strategy* outlines the overall test strategy for all three original releases of the BOSS project.  It describes all key phases of testing as well as the tools, policies, and procedures that will govern the BOSS testing process.

Our findings include:

- **The *Test Strategy* describes the BOSS project's approach to testing, and covers the topics KPMG expects to be addressed in testing of ERP's of this size and complexity, except for performance/stress testing whose plans are not due until January 2009.**

    The Test Strategy includes the documentation of test:

    - Environments
    - Timelines
    - Tools (software)
    - Roles
    - Data
    - Defect management procedures
    - Exit/entry criteria
    - Sign-off procedures

    The strategy addresses the changes—both procedural and to the environment—that will affect the test approach between releases. The multi-release approach for BOSS requires dedicated environments to allow for production support changes while development and testing continue for Releases 2 and beyond.  This approach will accommodate the phased rollout of HR/Payroll after the initial release of Procurement.  This approach will also support a Finance release and any other enhancements the District may perform after the current BOSS project scope is completed. Additionally, regression testing of existing functionality would then be required.  Both of these points are appropriately addressed in the strategy.

- **The level of test automation is not clearly defined in the *Test Strategy*, particularly for regression and performance test.**

  Certain sections of the *Test Strategy* refer to using test automation tools such as QuickTest Professional and LoadRunner but defer a final decision on the use of such tools to the BOSS project management office.

  Automated test tools are practically a necessity to effectively conduct regression and performance tests in the timeframes required by implementations of BOSS' size and complexity. BOSS team members must be trained in the effective use of automated testing tools. Unplanned costs for test automation can be high and often prohibitive if performed by external consultants instead of District personnel.

- **Exit criteria described in the *Test Strategy* regarding the allowable number and type of defects between Integration Test cycles and other phases of testing do not match the defect severity definitions outlined elsewhere in the *Test Strategy.***

  The documented exit/entry criteria is often a significant point of contention between quality controllers (test managers, stakeholders, auditors) and the system implementers when trying to determine if a key phase of testing was indeed completed successfully. These exit/entry criteria serve as gatekeepers in determining if a project should proceed to the next phase of testing or go-live. Inconsistent criteria will hamper resolution of these matters and create an opportunity for subjective interpretation of test results.

- **The *Test Strategy* document has not been updated to reflect the SP-1 scope changes.**

## 5       Recommendations and Corrective Actions

KPMG's review of the BOSS project implementation brought to light both the strengths and weaknesses of the SAP implementation project.  In this section KPMG presents recommendations developed since our Interim Report dated September 24, 2008.

The interim findings and recommendations are presented and updated in **Appendix C**.

### 5.1       Financials and Schedule Recommendations

**5.1.1 – Adjust the project work plan to reflect delays and consider alternatives to the deployment plan.**

The BOSS PMO, working with ITS, should develop a realistic schedule for the development of the legacy system interfaces.  Unrealistic target dates increase the risk that the quality of development, program documentation and sufficiency of testing of BOSS system components may be compromised.

If existing delays cannot be made up and additional delays arise, the BOSS PMO should consider options to the current development and deployment plans.  Alternatives to consider include:

- o Delay the overall go-live date and Deloitte SAP implementation by two months.  The cost exposure for this option is estimated at $7,250,000: Deloitte - $6,250,000, M-DCPS BOSS Project Resources $1,000,000.

- o Realign and focus ITS resources on the legacy system development objects to support the HR/Payroll Schedule and delay the Procurement go-live date by two months to accommodate the additional time needed to complete the legacy Procurement system updates.  Extend the Deloitte Procurement team for two additional months.  The cost exposure for this option is estimated at $2,500,000:  Deloitte - $2,000,000, M-DCPS BOSS Project Resources $500,000.

- o Uncouple the legacy system updates from the SAP implementation schedule and maintain the current go-live dates.  Release the Deloitte team per the contract schedule and leverage ITS to support the production system roll out.  The cost exposure for this option is estimated at $750,000.

KPMG recommends, as the preferred option, that the BOSS team consider placing MSA legacy system updates (not interfaces) on a separate time-line from the SAP HR/Payroll and Procurement development, testing and training schedule.  ITS can upgrade the MSA legacy environment and test it independently.  This approach will minimize the District's exposure to additional Deloitte consulting fees.

### 5.1.2 – Assess impact of bringing the Finance module back into scope.

As of the date of this report, no analysis has been performed to assess the impact of implementing the Finance modules. KPMG recommends the BOSS project management team, Steering Committee, and executive leadership, as appropriate, to evaluate the following areas that could potentially impact the implementation of the Finance module:

- Accuracy and completeness of existing design documentation created pre-SP-1
- Re-design requirements of SAP/MSA interfaces created as a result of deferring the implementation of SAP Finance components (SP-1)
- Estimated costs
- Projected timeline
- Resource needs, including technical, finance, and District knowledge requirements

The sooner District management assesses the impact of implementing the Finance module, the better District management will be able to seek required funding, and help ensure that the BOSS project will be supported by personnel with the required skill-sets in the timeline required.  KPMG does not believe that the $3M contingency funds in the BOSS budget are sufficient for implementing the Finance module.

### 5.1.3 – Enhance review of vendor invoices prior to payment processing.

As noted in Section 2 of the report, there where invoice discrepancies and $150,000 credit is due to the District. KPMG recommends that the District's PMO more thoroughly review invoices before processing vendor payments to ensure that invoiced amounts are appropriately based on the fee schedule specified in Deloitte's SOW.

### 5.2 Deliverables and Knowledge Transfer Recommendations

**5.2.1 – Establish a long term strategy for the tools used in all phases of testing.**

The *Testing Strategy* deliverable describes several tools that will be used in various phases of testing. M-DCPS should investigate the use and ownership of these tools post-implementation. For tools that are owned by M-DCPS, their long term use should be affirmed and incorporated into the *Knowledge Transfer Plan* for the District. For tools owned by Deloitte that M-DCPS chose not to acquire, M-DCPS should begin to develop a strategy for migrating data, scripts, policies, and procedures onto another tool.

**5.2.2 – Evaluate knowledge transfer of BOSS District personnel and update the *Knowledge Transfer Strategy* document to reflect assessment process changes.**

There is no evidence of knowledge transfer assessments being performed of M-DCPS BOSS project members to-date. KPMG recommends performing, as soon as possible, the knowledge transfer plan assessment as part of the HR evaluation process. Throughout the life of the project, M-DPCS should periodically assess the ERP skill-sets of BOSS District personnel, and thus, the District's ability to support BOSS post the go-live date with or without external assistance.

As a living document, the *Knowledge Transfer Strategy* document should be updated to reflect the changes of the knowledge assessment process as part of Human Resources evaluations. The document should be re-approved by the PMO and M-DCPS and Deloitte team leads.

**5.2.3 – Perform regular maintenance of project documentation to ensure content is up-to-date.**

Specific deliverables have been identified as living documents, for example the *Communication Plan* and *Knowledge Transfer Plan*, where information may change over the life of the project. KPMG recommends that living documents are periodically reviewed and maintained to ensure that content is up-to-date.

**5.2.4 – Enhance PMO resources for the District.**

KPMG recognizes the PMO process for a large project such as the BOSS ERP implementation is complex and time consuming. The Deloitte team has been appropriately staffed to track and manage the various tools used in the score

carding process. The District PMO has not been equally and sufficiently staffed. Additional District PMO resources would allow the BOSS Project Manager to remain focused on the day-to-day activities required to manage this complex project while providing a view of project status that is less dependent on Deloitte's PMO leadership.

## 5.3    Testing and Quality Assurance Recommendations

### 5.3.1 – Determine the capacity and aptitude for test automation early.

The BOSS project team should immediately determine the cost and capacity for developing automated test scripts. Key phases of testing such as performance test and regression testing often cannot be done adequately without automated tools. Automation requires procuring the right tools, and training or obtaining resources with specific skill sets in developing automated test scripts. Test data creation for automated test scripts can also be very different from the demands of test data creation for stand alone test scripts.

In most instances, it is impossible to simulate the load placed on computer systems in production without automated test scripts. Automated test scripts typically run on a third party software package and simulate hundreds if not thousands of users accessing the system simultaneously. This load simulation is required when conducting a performance test.

Additionally, it may be time and cost prohibitive to run the entire set of integration test scripts during regression testing after a system upgrade. Given the challenge, organizations either extend their testing timeline or—more likely—cut the scope of regression testing at the risk of not identifying all defects prior to promoting changes to production.

The time to implement and develop these automated test scripts needs to be reflected in the overall project timeline. Automated script development and execution is a specialized skill set.

### 5.3.2 – VMWare generates increased need for automated stress/performance testing.

Performance testing is critical for an ERP system serving a user population the size of M-DCPS. BOSS has adopted VMWare, a hardware virtualization software that introduces an additional layer of complexity to the BOSS project. VMWare makes it all the more essential to plan and perform sufficient performance testing before the BOSS go-live.

VMWare was selected for hardware cost savings and as a result of M-DCPS' data center's limitation in providing sufficient energy and cooling for conventional hardware needed to run SAP.  The cost of upgrading the data center and procuring physical hardware to support the SAP servers would be prohibitive.  M-DCPS is involving key vendors such as SAP, VMWare, and Deloitte in its implementation plans to help mitigate the risks associated with using a virtual hardware environment.  Only a thorough performance test can help assure the District that the virtual environment can support the full demands of peak production use.  Particularly high volume periods include open enrollment, year-end processing, and school start and close business cycles (e.g., hiring school personnel).

### 5.3.3 – Validate that Exit/Entry criteria for all phases of testing are consistent with test reporting metrics.

Deliverable #34, *Test Strategy*, referred to "Critical" defect counts as an exit /entry Criteria for integration test and user acceptance test.  However, *Test Strategy* defines only "High", "Medium", and "Low" as defect severity or priority classifications.  The BOSS team should update the *Test Strategy* to define "Critical" or "Minor" categories, or change the exit/entry criteria to refer to only High, Medium or Low defects.

### 5.3.4 – Clarify the distinction between defect priority and defect severity.

The Defect Management and Reporting section of the *Testing Strategy* deliverable defines both defect priority and severity.  It is often confusing to understand how the combined fields in combination define the order in which defects are addressed.  The *Test Strategy* should be updated to clearly define which field drives exit/entry criteria.  Additionally, a matrix and/or decision tree should be developed to define the process for determining the authoritative order in which defects should be addressed (e.g., Priority as the primary sort and Severity as the secondary sort).

### 5.3.5 – Maintain strong sponsorship and governance for the procedures defined in the *Test Strategy*.

The *Testing Strategy* deliverable outlines several proven approaches for testing large and complex systems.  Nonetheless, projects of this size and complexity are susceptible to relaxing procedures when timelines and budgets become constrained.  In particular, the BOSS project should be increasingly aware of following procedures and ensure that they are rigorously followed:

- **Exit/Entry Criteria**
  The *Test Strategy* defines exit/entry criteria for each phase of testing. Milestones should be identified in the project plan as key phases of testing begin and end so that the Executive Steering Committee can review the exit/entry Criteria and validate that they are being followed. Any risk associated with proposed changes to the exit/entry criteria should be evaluated completely and signed-off by the Executive Steering Committee prior to accepting any changes to the criteria.

- **Separation of Duties**
  The *Test Strategy* specifies that the test script designer can't be the sole tester of his/her own script. Resource constraints can create pressure to overlook this separation of duties requirement.

- **Preparing Test Data (EPI-USE)**
  The *Test Strategy* calls for training M-DCPS resources in EPI-USE. This tool is critical in helping prepare test data for many phases of testing including parallel payroll testing. Project timelines and resource allocations must support project resources receiving appropriate training and allowing for the time to create and load test data.

## Appendix A: Interviews Conducted

Below are the individuals, which the KPMG team leveraged to gather insight and information regarding the BOSS project.

| Area | Name |
|---|---|
| **M-DCPS Board** | Agustin, Barrera, Board Chair |
| | Perla Tabares Hantman, Vice-Chair |
| | Ana Rivas Logan, Member District 7 |
| | Dr. Marta Pérez, Member District 8 |
| **Superintendent** | Alberto Carvalho, former Associate Superintendent, Office of Intergovernmental Affairs and Grants Administration and BOSS Steering Committee member |
| **BOSS Steering Committee** | Ofelia San Pedro, Deputy Superintendent & Project Sponsor (pre-SP-1) |
| | Carolyn Spaht, Associate Superintendent & Project Sponsor (post-SP-1) |
| | Deborah Karcher, Project Sponsor (as-of 10/2/2008) & Executive Officer, Information Technology Services |
| | Dr. Grace Ali, Chief Financial Officer |
| | Steve Maldonado, BOSS Project Manager |
| | Michael Weeks, Project Partner Deloitte Consulting |
| | Allison Eng-Perez, Project Director Deloitte Consulting |
| | Caroline Dellaway, Project Manager Deloitte Consulting |
| | Allen Vann, Chief Internal Auditor |
| | Joseph Gomez, Assistant Superintendent Procurement |
| | Vera Hirsh, Assistant Superintendent, Office of HR, Recruiting, and Performance Management |
| | Connie Pou, Controller |

| Area | Name |
|---|---|
| **BOSS Project Members** | Randell Carr, M-DCPS Finance Lead |
| | Ulrine Olivier, Deloitte HR Release Lead |
| | Bud Beaven, M-DCPS Human Resources Lead |
| | Stephen Blitstein, Deloitte Human Resources Lead |
| | Susan Lilly, M-DCPS Time & Payroll Lead |
| | Debby Wright, Deloitte Time & Payroll Lead |
| | Jose Fernandez, M-DCPS Change Lead |
| | Monique Francois, Deloitte Change Management Lead |
| | Linda Jones, M-DCPS Technology Lead |
| | Paul Mahoney, Deloitte Technology Lead |
| | Allan Mozingo, Deloitte Procurement Release Lead |
| | Joanne Koski, M-DCPS Procurement Lead |
| | Manish Kapoor, Deloitte Procurement Lead |
| | Roxana Vega, M-DCPS PMO |
| | Delia Graces, Deloitte Consulting PMO |
| | Wilfredo Cata, Deloitte PMO Support |
| | Maulik Shah, Deloitte PMO Support |
| | JC Padilla, Deloitte PMO Support |
| | Eric Ojeda, A/P Director |
| **ITS** | Craig Rinehart, Administrative Director Business and Operational Services |
| | Victor Diorio, Executive Director Technical Architecture |
| | Nicholas Di Liello, District Director Systems and Programming Services |
| **Internal Audit** | Trevor Williams, Assistant Chief Auditor |

## Appendix B: Project Documentation Included in Scope of Review

Below are the BOSS project documents that KPMG inspected.

| # | Project Document |
|---|---|
| 1 | Master Service Agreement (MSA) Between M-DCPS and Deloitte (July 12, 2007) |
| 2 | Revised Statement of Work Between M-DCPS and Deloitte as a result of SP-1 (June 26, 2008) |
| 3 | Deloitte Change Order Amendment MSA after SP-1 |
| 4 | Deloitte's original RFP response |
| 5 | Project Charter |
| 6 | Communication Strategy |
| 7 | Communication Plan (ID #10) |
| 8 | Communication Plan Updates – Q2 and Q3 |
| 9 | Communication Logs |
| 10 | Steering Committee Presentations |
| 11 | Superintendent Updates |
| 12 | Monthly and Project Status Reports |
| 13 | Data Conversion Strategy (ID #21) |
| 14 | Test Strategy |
| 15 | Project Team and Training Strategy Plan |
| 16 | System Landscape and Technical Design |
| 17 | Stakeholder Engagement Plan |
| 18 | Preliminary FRICE-W list |
| 19 | Preliminary Risk Management Matrix |
| 20 | Project Plans |
| 21 | Project Scorecards |
| 22 | BOSS Organizational charts |
| 23 | August 4, 2008 memo from Concerned Tax Payers of Miami-Dade County to Carolyn Spaht, Chief of Staff |
| 24 | August 14, 2008 memo from Dr. Rudolph Crew, Superintendent of Schools to the M-DCPS Board. Subject: Staff Follow-up-Agenda Item H-16, School Board Meeting of July 15, 2008 – Contractual Agreement With Deloitte Consulting |
| 25 | August 20, 2008 memo from Dr. Marta Pérez, Board Member to Dr. Rudolph Crew, Superintendent of Schools. Subject: Contractual Agreement With Deloitte Consulting – Observations, Notices, and Request for Supporting Documentation |
| 26 | September 8, 2008 memo from Dr. Marta Pérez, Board Member to the M-DCPS Board. Subject: Termination of |

| # | Project Document |
|---|---|
| | Contract With Deloitte Consulting LLP |
| 27 | September 10, 2008 memo from Dr. Marta Pérez, Board Member to Dr. Rudolph Crew, Superintendent of Schools. Subject: M323 - Contractual Agreement With Deloitte Consulting – Observations, Notices, and Request for Supporting Documentation |
| 28 | September 12, 2008 memo from Dr. Rudolph Crew, Superintendent of Schools to the M-DCPS Board. Subject: Enterprise Resource Planning Project (ERP) Update |
| 29 | BOSS Project Cost Budgets (baseline and SP-1) |
| 30 | BOSS Project Expenditures (as-of 9/30/2008) |
| 31 | Data Conversion Strategy |
| 32 | End User Testing Strategy |
| 33 | Detailed Development Plan (FRICE-W Scope/List) (ID #31) |
| 34 | Knowledge Transfer Strategy (ID #37) |
| 35 | System Organizational Hierarchy Configured (ID #42) |
| 36 | Configuration and Unit Test Plan (ID #43) |
| 37 | Baseline Configuration (ID #44) |
| 38 | Training Development Processes and Standards (ID #60) |
| 39 | GRC Application Design and Requirements Definition (ID #76) |
| 40 | Acceptance and Criteria Sign-off Forms for the following deliverables:<br>• Communication Plan<br>• Data Conversion Strategy<br>• End User Training Strategy<br>• Detailed Development Plan (FRICE-W Scope/List)<br>• Knowledge Transfer Strategy<br>• System Organizational Hierarchy Configured<br>• Configuration and Unit Test Plan<br>• Baseline Configuration<br>• Training Development Processes and Standards<br>• GRC Application Design and Requirements Definition |
| 41 | Test Strategy (ID #34) |

## Appendix C: Interim Recommendations and Key Corrective Action Implemented since Interim

**Key Interim Recommendations: Corrective Actions Implemented**

KPMG has obtained evidence that the District has taken action on certain key recommendations identified in the Interim report.

| Interim Recommendation | Updates |
|---|---|
| Hold regular workshops with the M-DCPS Board that communicate the overall progress of the BOSS project. | The Superintendent has described plans to conduct meetings with Board members to discuss the BOSS project. |
| Evaluate ITS project priorities, resource availability and budget allocation. | The BOSS PMO is working to integrate the ITS and BOSS work plan to represent critical paths and milestones for BOSS project activities. As of the date of this report, the work plan has not been finalized. |
| Establish consistent BOSS project sponsorship and leadership. | Deborah Karcher, Executive Officer ITS has been appointed as the new BOSS Project Sponsor. |
| Consider post production sponsorship when identifying the BOSS project sponsor and establishing the governance structure. | Post production support will be managed by ITS, led by Deborah Karcher. |
| Increase the breadth and depth of updates to the BOSS project Steering Committee | The status report presented by BOSS team leadership at the October 2008 Steering Committee meeting, the first after KPMG's September 24, 2008 interim report was released, was more thorough than the report presented at the prior monthly Steering Committee meeting. |

Below is the complete list of observations and recommendations included in KPMG's Interim Report dated September 25, 2008. The numbering scheme from the Interim Report is retained in this appendix for ease of reference. The recommendations have not been updated, except as described above.

**Observations, Risks, and Recommendations:**

### 2.1      Executive-level Communication

**2.1.1 – Hold regular workshops with the M-DCPS Board that communicate the overall progress of the BOSS project.**

See updates in the Interim Correction Action Updates section of Appendix B of the Final report

Section 5.4 – Interim Corrective Action Updates

**2.1.2 - Increase the breadth and depth of updates to the BOSS project Steering Committee.**

See updates in the Interim Correction Action Updates section of Appendix B of the Final report

**2.1.3 – Include financial performance information and variances in monthly status reports issued to the BOSS Project Sponsor.**

The BOSS monthly status report, prepared by Deloitte Consulting, currently provides an overview of project status--timeline, issues, risks, and project changes, for example--but does not include project financial performance information, estimate-to-complete forecasts, and variances noted to-date.

BOSS monthly status reports should include a status of how the project is progressing against the schedule and budget, and document any variances noted against baseline targets.

KPMG observed that monthly project status reports are finalized and published two to three months after the close of the reporting period.  BOSS monthly status reports should be submitted timely to the Project Sponsor, preferably within a week after month-end to keep the Project Sponsor informed of the financial health of the project and potential project overruns.

BOSS monthly status reports could also be leveraged to communicate the project's status to the Steering Committee as previously recommended (**2.1.2**).

## 2.2    Information Technology Services (ITS) Department

### 2.2.1 – Leverage the ITS department to provide more institutional knowledge of legacy systems to the BOSS project team.

Much of the knowledge of M-DCPS business processes and their supporting legacy systems resides with members of the ITS department.   The BOSS project team consists to a significant degree, of resources sourced from the District's functional organizations and new hires from outside the District.

Staffing shortfalls and the disproportionate number of external hires has impacted data gathering and future state process design.  It has also been challenging for the project team to acquire the detailed knowledge required for documenting specifications during the build phase.  The project team has continuously struggled to acquire the necessary technical knowledge to identify, categorize, and map data requirements to and from the District's legacy systems. Documentation of the District's legacy systems is inadequate or non-existent.

The BOSS project faces challenges in the development of functional specification documents during the current build phase and this will continue to be a risk to the project during the upcoming conversion and testing cycles. There is also a risk that business critical interfaces may not be identified timely and included in the scope of the BOSS project in a timely manner.

The recent involvement of ITS resources in the project has helped close this institutional and systems knowledge gap.  While ITS' involvement was deemed limited by the project team, improvements have been noted beginning in August 2008.  Additionally, the District's CIO has been added to the project's PMO team as the ITS Advisor.  The continued support from the ITS department throughout the life of the BOSS project is vital to ensure that critical tasks are completed and timelines are met.

### 2.2.2 – Evaluate ITS project priorities, resource availability and budget allocation.

See updates in Section 5.4 – Interim Corrective Action Updates

## 2.3    Project Sponsorship

### 2.3.1 – Establish consistent project sponsorship and communication to support the BOSS project.

See updates in the Interim Correction Action Updates section of Appendix B of the Final report

**2.3.2 – Consider post production sponsorship when identifying the BOSS project sponsor and establishing the governance structure.**

See updates in the Interim Correction Action Updates section of Appendix B of the Final report

### 2.4      Post "Go-Live"

**2.4.1 - Develop a skills retention program and resource transition plan for a post go-live support model.**

The BOSS Project resource transition plan has not been developed.  Project Deliverable #41, *Initial Production Support Organization Plan* should identify the post-production functional and technical support roles, responsibilities and competencies for each position.  The M-DCPS functional and technical leadership teams should leverage this document to develop the end-user support and technical resource staffing model, and budgeting for post-production solution support and maintenance.

The District has invested a considerable amount of time and financial resources, training and developing BOSS SAP competencies, and should be proactive in the management of a skills retention program.  The project management team should then work with the functional and technical leadership to assess BOSS project team members and develop recommendations for post-production role assignments.  Development and communication of a resource transition plan is a critical success factor to minimize employee anxiety over post project job security and mitigate the risk of losing acquired skill-sets and institutional knowledge.

A well-defined skills retention program and resource transition plan should be developed 10-12 months before the go-live date.  The transition plan identifies:

• Production support resources required to support the SAP application in steady-state production, including the employee's position, BOSS project roll-off date, and support role to fulfill.
• Resources that will return to business positions, including the employee's position, BOSS project roll-off date, department to transition to, and the role to fulfill.
• Communication methods that will be used to keep project stakeholders and employees involved and aware of the transition process.

**2.4.2 – Expedite the implementation of the Finance module after completion of the HR and Procurement go-live releases, to reduce the risks of SAP solution re-design, documentation and SAP/MSA interface maintenance.**

The deferral of the implementation of SAP Finance components, authorized by SP-1, required the re-design of system interfaces and the development of new SAP/MSA interfaces. KPMG recommends that M-DCPS plan to implement the deferred SAP Financial components as soon as possible. If modifications are made to the MSA (legacy) environment, after the BOSS design phase is completed, design documentation, including system interfaces, will need to be re-assessed and updated to reflect changes that may affect the implementation of the SAP finance modules in the future.

In order to reduce the impact of legacy changes, M-DCPS should consider identifying a cut-off date that freezes changes to the legacy environment. If after assessing a proposed change, it is determined that a legacy modification is required, a legacy change plan should be developed that documents:

- Change management procedures
- Review and approval from the change control review board, including involvement from ITS
- Impact to SAP HR and Procurement releases
- Impact on existing BOSS Finance design
- Required changes to existing BOSS Finance design deliverables

**2.4.3 – Expedite the implementation of the Finance module post the implementation of the HR and Procurement releases to mitigate increased complexities.**

The deferral of implementing the SAP Finance module will extend and increase the level of support of the legacy MSA system. With the non-implementation of the Finance module, M-DCPS will be unable to retire the MSA system which will require maintenance of both SAP and legacy environments. With dual systems, the District will be responsible for:

- Regular maintenance activities
- Synchronization between environments
- Duplicate entry requirements in both environments (i.e., purchase order changes and goods receipts for inventory items)
- Increased production support
- Increased demand over support resources

### 2.5 Project Management Office (PMO)

**2.5.1 – Continue ongoing PMO efforts to manage and monitor the delivery of BOSS project's initiatives.**

The BOSS project is supported by a robust and well-structured PMO. The PMO is staffed with qualified, experienced personnel from the District and Deloitte Consulting, the project integrator. The experience level and the number of senior-level PMO leadership are appropriate for the size of the school District and project complexity.

The PMO uses a comprehensive project plan and scorecard based status reporting to track the project work streams. In addition, weekly meetings are held with M-DCPS resources and Deloitte counterparts to review the project's status, timeline, and issues.

**2.5.2 – Include an overall project scorecard to ascertain the project's status against critical paths and key milestone dates.**

Scorecards are currently documented and reviewed per functional area on a weekly basis. The PMO should consider extending the functional area scorecards to include critical path tasks and milestones from the project plan. A recovery plan should be identified for areas that are late to schedule and may impact successor tasks and activities identified in the project plan.

As part of the final BOSS Project Assessment report, KPMG will analyze samples of functional area scorecards to assess the quality of the information presented.

**2.5.3 – Extend the BOSS project plan and scorecards to monitor ITS resource and external task dependencies.**

The BOSS project plan and scorecards do not incorporate ITS resource and task dependencies. In addition, ITS' budget and resource constraints, including scheduled holiday shut-down dates are not reflected in the overall BOSS project plan.

The BOSS PMO should incorporate in the overall BOSS project plan, the tasks, critical paths, and key milestone dates that are dependent on ITS. The project plan should record and track ITS activities, including interdependencies, to better assess potential impacts on the overall project timeline. Project scorecards should also reflect the overall status of ITS assignments.

The ITS department should manage their internal project plan timeline based on the BOSS project requirements to track accomplishments and estimates-to-complete. Updates should be sent to the PMO to reflect updates in the BOSS project plan and scorecards. By actively tracking and monitoring these ITS dependent tasks, the project can address potential slippage and reduce the risk of unplanned delays that could affect the health of the project.

### 2.5.4 – Address on-boarding lead times for additional M-DCPS resources to be added to the project.

The District's on-boarding process requires significant lead time. Shortfalls in District staff levels versus those originally documented in the project's SOW were noted across teams. The timing of District personnel on-boarding the project has not met the original project plans which caused delays in the project plan and increases the risk that M-DCPS may not having resources with the right level of knowledge and experience to support the system beyond go-live. On-boarding schedules resulted in inefficiencies when new members were brought on in small groups, resulting in additional training effort than originally planned.

The BOSS project team should work with the District to minimize delays in the hiring of new and replacement project resources. The impact of the lead time should be reflected in the project work plan going forward.

### 2.5.5 – Continue the use of online documentation repositories to enable interaction and communication amongst project team members.

Web-based project management repositories are available within the BOSS project, where project documentation is centrally stored and available to all project team members. Online documentation repositories enable project team collaboration and facilitate better knowledge-sharing of project deliverables, communications, and issue management. The online repositories are designed to centrally store, track, share, and reuse information throughout all phases of the BOSS project.

Although there are a series of document repositories housed in a variety of tools, i.e., e-Room, Quality Center, ThreadManager, and Industry Print, the PMO has organized structured training for project employees over the use and content of the available tool-sets.

## 2.6    Project Deliverables

### 2.6.1 – Finalize and approve the *Risk Management Plan*.

A *Risk Management Plan*, typically created during a project's planning phase, remains unapproved and unpublished.  The *Risk Management Plan* is a living document that assists the project management team in identifying foreseeable project risks, defining severities, measuring occurrence, and establishing a mitigation plan.

Managing a project without a *Risk Management Plan* may impact the early detection of risk triggers should they arise, as well as delay response plans to mitigate encountered risks. The BOSS PMO should expedite the finalization, approval, and publication of the *Risk Management Plan* to enhance the overall risk management process for the project.  Additionally, the plan should be used as an on-going tool given that it is designed as a living document.  This plan should be updated on a regular basis, and updates should be discussed with BOSS project management, Steering Committee members, and executive leadership, as appropriate.

### 2.6.2 – Update the disaster recovery plan to include ERP requirements.

The existing disaster recovery plan for the District has not been updated to include ERP requirements.

Keeping a relevant disaster recovery plan is just part of the overall Risk Management Plan the District needs to minimize significant business disruption in the event of a disaster.

The implementation of a comprehensive business continuity plan that includes a business impact analysis, threat analysis and recovery scenarios should be documented for all critical areas in the District.  The complete risk management process would enable the District to build resilient business and technology operations that would minimize the disruption to people, processes and technology in the event of an unplanned interruption of operations.

### 2.6.4 – Obtain agreement from key District resources on critical tasks.

Legacy data cleanup activities and subsequent conversion efforts are a known critical risk area for the BOSS project.  The *Data Conversion Strategy* (MD-21) is a project deliverable that identifies the ITS group as a key technical resource. However, the *Data Conversion Strategy* exhibited no evidence of ITS involvement or formal sign-off from the department.

Where ITS is identified as a key resource, BOSS project management should ensure the participation and commitment of ITS, specifically in obtaining their input and approval on all deliverables. More importantly, many activities identified in the Data Conversion Strategy depend on ITS led activities. ITS needs to agree to the approach and to appropriately plan for the effort. The ITS work plan should be resource loaded and appropriately reflected in the BOSS project work plans.

## Appendix D:  Analysis of schedule delays

KPMG analyzed the planned versus actual completion dates of various development metrics (FRICE-W, Unit Testing, BPPs, and IMG Configuration) from project inception to date, projected the BOSS team historical results forward and compared KPMG's projection to the BOSS team's planned completion dates.

The graphs below illustrate the analysis KPMG performed by using trend lines to project completion dates.  The graphs also show the coefficient of determination ($R^2$), a statistical value that helps quantify the reliability of the trend line.  The closer this number is to 1.00 (absolute certainty) the more reliable the trend line is.  KPMG used various regression models (i.e., linear, polynomial, exponential, etc.) and used the model that provided the highest confidence level ($R^2$ value).

The charts indicate a projected completion date that averages approximately four weeks later than the BOSS project plans.
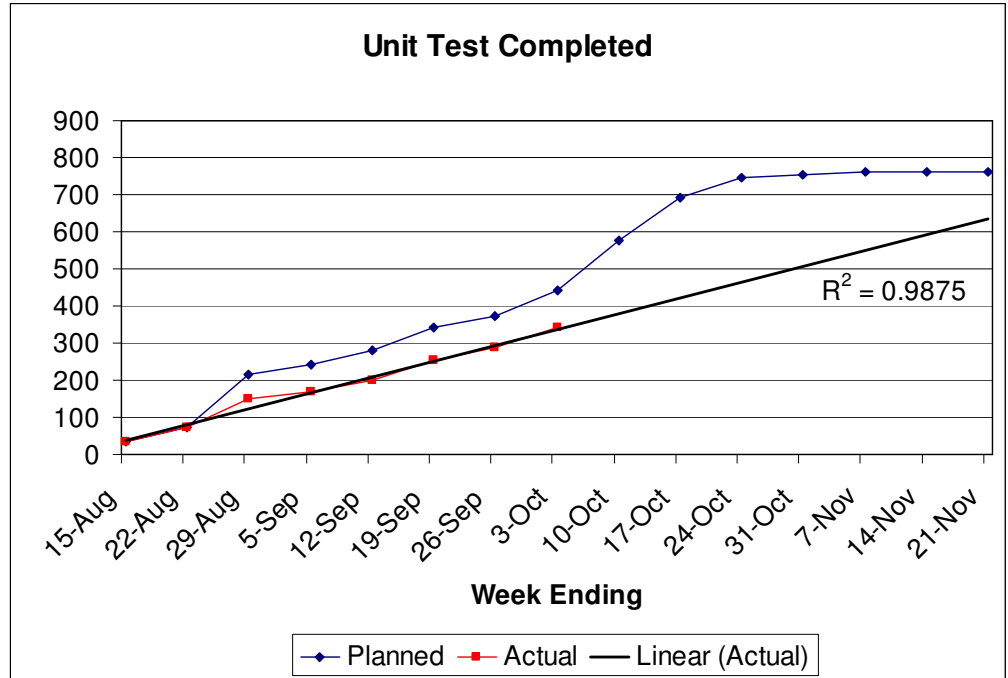
**FRICE-W – Functional Specifications**

The chart below illustrates the Functional Specifications planned versus actual completion counts. It also shows the trend line and R² value that estimates the projected completion date based on historical data and the statistical reliability of the data, respectively.
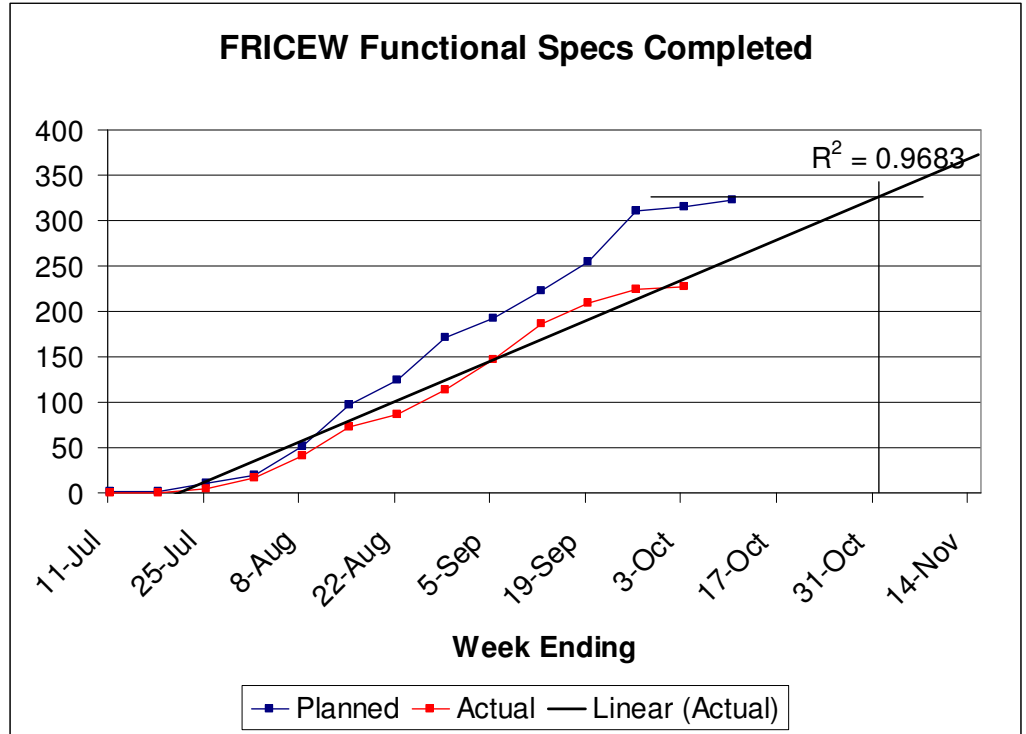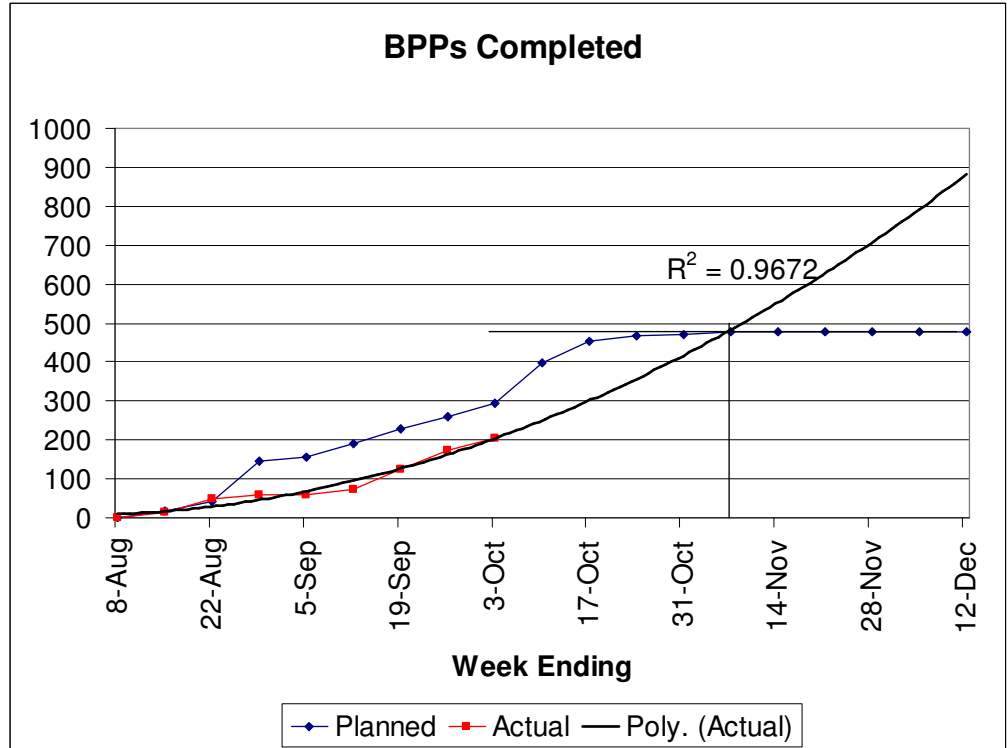
**UNIT TESTING**

The chart below illustrates the Unit Testing planned versus actual completion counts. It also shows the trend line and R² value that estimates the projected completion date based on historical data and the statistical reliability of the data, respectively.



**Unit Test Completed**

$R^2 = 0.9875$

Week Ending

Planned — Actual — Linear (Actual)

The trend line indicates that Unit Testing will not be completed in a timely manner. However, the actual data shows an approximate delay of only one week. This was taken into account in our assessment of an estimated completion date.

**BPPs**

The chart below illustrates the BPPs planned versus actual completion counts. It also shows the trend line and $R^2$ value that estimates the projected completion date based on historical data and the statistical reliability of the data, respectively.

### BPPs Completed

$$R^2 = 0.9672$$

Legend: ◆ Planned ■ Actual — Poly. (Actual)

X-axis (Week Ending): 8-Aug, 22-Aug, 5-Sep, 19-Sep, 3-Oct, 17-Oct, 31-Oct, 14-Nov, 28-Nov, 12-Dec

Y-axis: 0, 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000

**IMG Configuration**

The project's score carding tools do not capture the actual completion date of IMG configuration, only whether the configuration was completed or not. KPMG performed an aging analysis of uncompleted items. The table below illustrates the analysis of IMG configuration items that were past due.

| Age | Count of Items |
|---|---|
| 1-15 days late | 122 |
| 16-30 days late | 52 |
| 31-45 days late | 13 |
| Over 45 days late | 18 |
| **Count of late items** | **205** |
| | |
| Count of completed (signed-off) items | 1246 |
| Total number of items | 2890 |
| Percent Complete | 43.18% |