Public Schools of North Carolina
State Board of Education
Department of Public Instruction

Report to the North Carolina General Assembly

School Business System Modernization

SL 2016-94, SECTION 8.15.(b)

Date Due: May 15, 2017
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M0116

SCHOOL BUSINESS SYSTEM MODERNIZATION

Plan

Submitted to:

Joint Legislative Education Oversight Committee

Prepared by

Office of the NC Superintendent of Public Instruction
Finance and Business Services, NCDPI
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FOREWORD

School Business System Modernization (BSM) is specified in *Session Law 2016-94 SECTION 8.15* as follows:

> *SCHOOL BUSINESS SYSTEM MODERNIZATION*
>
> *SECTION 8.15.(a) The State Board of Education shall collaborate with the Friday Institute for Educational Innovation at North Carolina State University (Friday Institute) to develop a plan to modernize the systems used by the Department of Public Instruction, Financial and Business Services Division, to manage and deliver funds and technical support services to local school administrative units and charter schools. This process shall include modernization of the Division's systems for student information management, financial and payroll information, human resources information, and capital and repairs and renovations planning information.*
>
> *SECTION 8.15.(b) By May 15, 2017, the State Board of Education shall report to the Joint Legislative Education Oversight Committee on the plan developed in accordance with this section for modernization of the systems used by the Financial and Business Services Division. The plan shall include the scope of work necessary to procure and transition the systems, an estimate of the costs of modernization of the systems, and a time line for implementation.*
>
> *SECTION 8.15.(c) By October 1, 2017, the Department of Public Instruction, in collaboration with the Friday Institute, local school administrative units, and charter schools, shall issue a Request for Proposal to outside vendors and entities for implementation of the plan.*

Pursuant to S.L. 2016-94 SECTION 8.15.(b), and in collaboration with The Friday Institute, the NC State Board of Education provides the report that follows[1].

[1] Approved by unanimous vote May 4, 2017.

EXECUTIVE SUMMARY

The NC State Board of Education and the Department of Public Instruction manage the State's public education enterprise – an enterprise funded with $9.25B in appropriated State funds and another $880M[2] in Federal funds, supporting 182,952 full time public school personnel[3]. If NC public education were a private enterprise, NCDPI would sit at #28 on the Forbes list of largest private companies in America[4]. The systems supporting the business and operational needs of public schools are a patchwork of commercial and homegrown systems, many with a heritage back to the early 1980s. In this report we present a scope of work for modernizing public school business systems, including estimated costs and a timeline for implementation.

The Case for Modernization

Of the $9.25B in State appropriations for public education, $8.64B comes from the General Fund, representing 38.7% of the entire General Fund budget. The public education share of the 2016-17 General Fund budget is more than that for health and human services, justice and public safety, and agriculture and economic and natural resources – combined. These facts alone provide significant justification for putting in place an integrated system of modern tools to effectively manage more than $10B in public education spending. Some specific goals of school business system modernization (BSM) include:

1. Enable near real-time position visibility and control

Currently, calculations and reports related to teachers are stitched together using at least three disparate sources – payroll code data, licensure data, and course code data. There is no single authoritative source for employee records. A modern system will provide robust position control that allows public schools to manage a single view of positions through allotment, budget, payroll, applicant tracking, onboarding, and human resource management. Position data will roll up to NCDPI data systems that will then provide enhanced reporting capabilities on licensed and unlicensed positions. Contemporary reports and dashboards will present timely views that include certified position counts, payroll summaries, contract days, and more.

2. Provide data management and advanced analytics for decision support

In general, accurate and timely reporting and analysis of financial, employee, student, and related data is cumbersome and even thwarted by the independent silos of data. Combined with business process established decades ago to answer a different set of questions on a different timescale, the current business systems are at the end of their useful life. A modern data management environment will provide automated access to the most current data. Advanced analytics will be applied to data on a continuous basis to help the State, districts, and individual schools make the best decisions to support the operation of schools and the education system. This modern decision support system will allow for:

- Improved tracking of expenditures against allotments.
- Regular access to the count of certified and non-certified personnel (and vacancies) per school, grade, subject, and mapping of current role.

[2] Excludes child nutrition

[3] Highlights of the North Carolina Public School Budget, February 2017, http://www.dpi.state.nc.us/docs/fbs/resources/data/highlights/2017highlights.pdf

[4] https://www.forbes.com/largest-private-companies/

- Modeling student-teacher ratios to support effective school management.
- Tracking teacher turnover within and between school LEAs.
- An extensible platform that can meet the unanticipated or unexpected needs of the state in the future.

3. Replace discontinued and obsolete systems

Core State financial systems are mainframe-based, originally deployed in the 1980s. To accommodate new State and Federal requirements, numerous applications using myriad technologies have been built to supplement the core State financial systems, resulting in dozens of applications that now need to be supported, maintained, and hosted. A modern data management and reporting environment will enable consolidation of reporting applications. Legacy applications, workflows, and supporting systems can be retired.

4. Simplify monitoring and compliance

A modern reporting environment provides near real-time feedback to LEAs on appropriate use of a State and federal funds and enables the State to report on behalf of LEAs and charters for all federal reporting, including the new US Department of Education (USED) Every Student Succeeds Act (ESSA) reporting requirements.

5. Eliminate unnecessary duplication

Currently, within LEAs and at NCDPI distinct business groups manually input data into parallel systems. In addition to a duplication of effort, this manual input increases errors and inconsistencies with data being reported differently in distinct reports. A modern system will have an integrated data service at its core that automatically collects data from the single authoritative source systems (e.g., from the ERP system, the student information system, the licensure system) that feeds reporting, analytics, and data visualization systems.

6. Increase efficiency of operations

Modern business platforms and data integration environments delivered via cloud-based service models allow school and NCDPI business staff to concentrate their efforts on analysis and decision support related to improving education rather than concentrating on care and feeding of server infrastructure and custom applications.

The marketplace includes competitive platform and systems integration offerings that can be deployed in North Carolina to achieve these business system modernization goals. A transition to modern systems must address business functions at the LEA and charter school level as well as reporting, monitoring, compliance and licensure systems at the State level. In short, a successful BSM program will:

1. Comprise LEA **enterprise resource planning (ERP)** systems, **statewide reporting**, and **licensure** systems;
2. Require **comprehensive planning**, design and implementation support;
3. Cost **between $150M and $250M** in one-time funding and take **6-8 years** to implement.

BACKGROUND

School business system modernization can build upon successful infrastructure programs and on the establishment of State-level DIT support functions. The School Connectivity Initiative (SCI) initiated in 2006, established a model for rigorous and comprehensive planning by leveraging NC State University's Friday Institute (FI) for technology planning and design expertise. The FI technology team followed the SCI work with the planning and implementation of the Race to the Top (RttT) funded NC Education Cloud (NCEdCloud) program. The NCEdCloud program included the development of a hosting service for LEA and NCDPI IBM iSeries servers. The iSeries servers are the primary hardware platforms supporting both LEA and NCDPI accounting and human resources systems – that is, the iSeries servers are at the heart of school business systems. SAS manages the iSeries hosting service, providing highly reliable, and secure access to business applications. As part of the NCEdCloud program, the FI published several documents that are foundational to school business system modernization work, namely:

1. *Report on iSeries-Based Business Processes and Interactions,* [August 2012]
   This report defines the business systems installed on LEA-managed iSeries servers and the file transfers between LEA iSeries systems and NCDPI, and the processes that govern the flow of reporting data.
2. *Human Resources Systems Modernization Report,* [November 2012]
   This report provides details about the human resources management system (HRMS) managed by NCDPI on behalf of the LEAs and offers recommendations for modernizing the functions of HRMS by leveraging commercially available applications and services.
3. *Developing a Data Integration Service for NC Education Cloud*, [May 2012].
   This document is a comprehensive plan that provides specifications for the development of a data management service that would automate the collection and distribution of NCDPI reporting data by leveraging contemporary protocols and processes.

While there are some details included in each of these documents that have changed since their publication, the core content is still valid and can be used to inform BSM plans and procurements. Following principles established for school connectivity, NC Education Cloud, and the NC Digital Learning Plan, the Friday Institute will be a valuable partner to NCDPI in the planning and design of business system modernization approaches.

Government Data Analytics Center

The Government Data Analytics Center (GDAC) is established as a unit of the department of IT in General Statute §143B-1385. The GDAC partners with State agencies to integrate data and develop reporting/analytics for improved decision making. The GDAC will serve as an important partner to NCDPI's Business System Modernization Program, contributing subject matter expertise and support that may include:

- Data cleansing
- Data integration
- Mastering of records
- Reporting
- Data visualization

Related NC Business System Modernization Initiatives

Session Law 2016-94 Section 7.10 directs both the Department of IT (DIT) and the NC Community College System (NCCCS) to proceed with planning, design, and implementation of enterprise resource planning systems. NCCCS has issued an RFP to establish a contract with an "*experienced functional, technical and strategic sourcing talent with proven planning and implementation for enterprise level ERP projects*"[5]. While platform requirements for community college versus K-12 ERP environments vary widely, planning and implementation support for the community colleges program could inform public school business system modernization. The initial target of DIT work in the ERP area is modernization of the North Carolina Accounting System (NCAS)[6]. Public school business system modernization program planning and implementation will include careful tracking of and integration with NCAS modernization work. DIT work and cost estimates are informed by commissioned Deloitte reports published in 2008 and 2014, and by responses to a request for information issued in May 2015. DIT reports estimated project costs of $110,789,000 for NCAS modernization through fiscal year 2020-21. Deloitte estimates from the 2008 and 2014 reports project costs of between $301M and $384M for statewide modernization of financials (NCAS) plus HR.

[5] *Progress on the Community Colleges System ERP Design and Implementation*, report to the Joint Legislative Oversight Committee on Information Technology and to the Fiscal Research Division of the NC General Assembly, January 15, 2017.

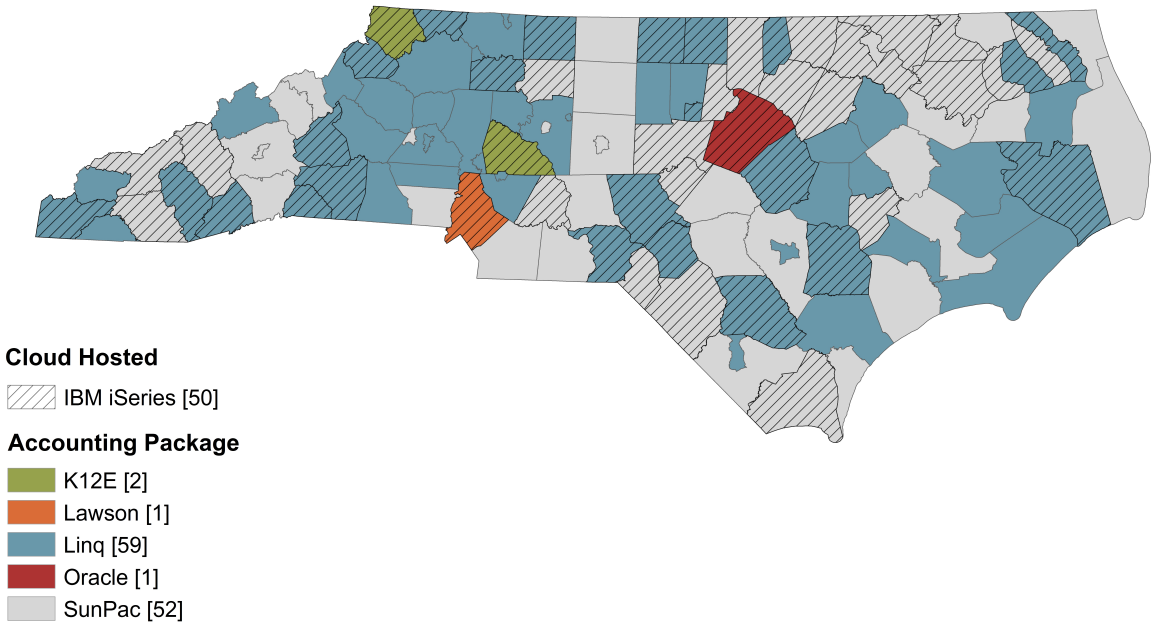
[6] *State ERP Progress Report*, report to the Joint Legislative Oversight Committee on Information Technology and to the Fiscal Research Division of the NC General Assembly, February 15, 2017.

THE SCOPE OF SCHOOL BUSINESS SYSTEM MODERNIZATION

School business systems comprise LEA and charter school enterprise resource planning functions, State-level reporting systems, and State-level licensure. LEA and charter school ERP functions include payroll, human resources (HR), fund accounting, procurement, general ledger, and related financial and HR applications. State-level reporting systems support the development of State and Federal reports, monitoring, compliance, and general auditing functions associated with the management and allotment of State and Federal funds. Licensure is an integral part of the teacher onboarding process, is an input to payroll, and serves as a data source for many reports. ERP, reporting and licensure systems, business processes, integrations, and workflows need to be modernized in a coordinated and integrated fashion.

LEA and Charter School Enterprise Resource Planning

Only the Wake County Public School System (WCPSS) and Charlotte-Mecklenburg Schools (CMS) support an integrated ERP environment today. WCPSS supports ERP functions on an Oracle platform, while CMS supports ERP functions on an Infor Lawson platform. The balance of LEAs and charter schools leverage one of three payroll and finance systems. Fifty-nine LEAs and all charter schools use Linq, provided exclusively for NC public schools by Education Management Systems located in Wilmington, NC. Most charter schools use a web-based version of Linq. Fifty-two LEAs use SunPac, a product originally developed by Sartox of Powhatan, VA. In March of 2012 Baltimore-based K12 Enterprise acquired Sartox. K12 Enterprise has their own K12 ERP product and they acquired Sartox with the intention of moving NC Sartox customers to the K12 Enterprise ERP suite. Five years after the acquisition, only two NC LEAs currently use the K12 Enterprise suite. While Oracle, Infor Lawson, and the K12 Enterprise suite incorporate substantial HR functions, Linq has recently added some HR functionality and Sunpac offers essentially no HR functionality. An NCDPI-developed and maintained Human Resources Management System (HRMS) provides some HR functionality. Numerous third party systems provide ancillary services such as substitute management, applicant tracking, time management, and many others. Linq and Sunpac software was originally hosted on IBM iSeries (AS/400) platforms. Linq has transitioned most functions to Microsoft Windows-based servers, but all Sunpac software requires an IBM iSeries system. HRMS functions are hosted on LEA iSeries servers as well. Fifty LEAs utilize SAS for hosted iSeries in lieu of maintaining a server locally. Most LEAs pay an outside consultant to maintain their iSeries systems and software configuration regardless of whether the iSeries server is at the LEA or hosted at SAS as part of the NCEdCloud.



The map above shows current accounting package use across the 115 LEAs, and shows which LEAs are currently hosting their IBM iSeries server in the NCEdCloud.

In a modern environment, all ERP systems will be Cloud-based, with no local infrastructure maintenance or support requirements, and no need for iSeries consulting services. In addition to being cloud-based, a modern ERP environment will include:

- Tightly coupled HR and Payroll
- Employee self-service portal
- Mobile as the primary user interface
- Contemporary and standards-based application interfaces and data exchanges
- Timely linkage between licensure, position, and salary
- Advanced data integration, analytics, and visualization
- Reliable, secure, scalable, and service-oriented support
- State-level rollup and interactive dashboards

All LEAs and charter school ERP environments should comply with these characteristics. There are many potential ERP implementation approaches, including:

- Implement a single Software as a Service (SaaS) solution across all 115 LEAs;
- Implement a single SaaS solution for all LEAs with the exception of WCPSS and CMS, where only modernized data reporting interfaces will be implemented;
- Target the 52 LEAs using Sunpac for a transition to a modern SaaS environment, while modernizing data reporting interfaces for WCPSS, CMS, and the 59 LEAs using Linq.
- Target LEAs with more than 1000 FTE for a transition to a modern SaaS environment, while modernizing data reporting interfaces for others.

While charter schools are required to report the same data under existing law, for the purpose of integration into an ERP charter schools should be treated with an independent plan since most employ an outsourced, managed-service organization for financial management and student reporting. In all of these approaches, there will be significant work involved in the transition of existing data and systems, and integration with local third-party applications and with State systems. Furthermore, any non-incumbent ERP provider will have to build a North Carolina configuration to implement NC-specific policies. The table below illustrates a subset of local and State integrations:

Local Integrations	State Integrations
Federal and State tax reporting	State Health Plan
Banking systems	State Retirement System – ORBIT
Third party benefit providers	PowerSchool
P-Card and e-Payable providers	NC educator evaluation system (NCEES)
Substitute management systems	Identity and access management systems
Applicant tracking systems	Cash management
Child nutrition systems	
Automated calling systems	
Local directory systems	

State Level Reporting

General Statute 115C-12 (18) defines the duties of the State Board of Education related to reporting – specifically, "*Duty to Develop and Implement a Uniform Education Reporting System, Which Shall Include Standards and Procedures for Collecting Fiscal and Personnel Information*." The Uniform Education Reporting System (UERS) incorporates the standards, processes, and tools that facilitate the collection, storage, transfer, and analysis of student, personnel, and fiscal data. Moreover, UERS shall allow for the tracking of expenditures for personnel, textbooks, supplies and materials and related expenses, at the LEA and school levels. NCDPI operates a statewide student information system, PowerSchool, and maintains the common education data analysis and reporting system (CEDARS) as core components of the UERS implementation. Fiscal data analysis and reporting systems have primarily been implemented through the development of applications that address individual reporting questions. In many cases, NCDPI must develop surveys to collect expenditure information in order to address questions related to spending against specific allotments. The table below summarizes NCDPI reporting systems by function:

Function	NCDPI Systems
Analyze expenditure data and reporting	MSA - external GL, MFR/AFR, and UERS
Report on and analyzing salary data	Salary Administration System, LicSal web
Process Cash Requests for LEAs, charter schools, and non-LEAs	Cash Management System
Process LEA payroll and general ledger adjustments and refunds	BUD (at LEAs) and IRM (at NCDPI)
Approve Federal Budgets /Amendments	BAAS
Allot State and Federal funds to LEAs, charter schools, and non-LEAs	NCDPI School Allotment System

Function	NCDPI Systems
Issue NC Educator Licenses	Licensure System
Manage LEA Human Resource Cycle (applications, hiring, benefits, evaluations)	Human Resources Management System (HRMS)
Federal reporting	Common Education Data Analysis and Reporting System (CEDARS)
Ensure nutritional, operational and financial integrity	School nutrition
Educator evaluation and professional development resources for teachers	HomeBase (eScholar Staff UID, TNL Educator Effectiveness, NCEES Educator Evaluation)
Web based planning/grants management tool	Comprehensive Continuous Improvement Plan (CCIP)

A modern reporting environment must build upon a sophisticated data integration service that collects data in an automated fashion from source systems and that provides authoritative data to target reporting systems using contemporary standards-based protocols and interfaces. Ideally, a modern system would be designed to be flexible enough that as legislation and policies change, business logic could be easily and swiftly added to the ERP system to ensure compliance and improve reporting. The Government Data Analytics Center (GDAC) within the NC Department of IT (DIT) is a likely partner in development of a modern data integration and reporting environment for public schools. The GDAC partners with agencies to integrate data and develops reporting/analytics for improved decision-making. Key areas where GDAC could contribute would include data fidelity, automating data access, reporting platform development, and data visualization.

State Level Licensure

NCDPI's Licensure Section is responsible for examining credentials and issuing professional educator licenses[7]. An online licensure system allows candidates to apply for an NC license, renew a license, update contact information and so on. The general public can also verify licenses through the system.

In addition to verifying that teacher candidates have completed a State-approved teacher education program and related subject matter testing, the Licensure Section verifies years of service and adds that information to the License. The Licensure Section continues to track years of service once a license has been granted and audits payroll data to verify that teachers are being paid properly according to the teacher salary schedule – resulting in substantial work correcting errors after paychecks have been printed.

In the current environment the entire State licensure database file is transmitted to each LEA every night for use by local payroll and HR management functions. The Licensure Section struggles to keep up with the high demand for new and renewed licenses, resulting in a backlog of unprocessed license applications. This backlog affects business processes within LEAs and the accuracy of reporting at the State level.

[7] http://www.dpi.state.nc.us/licensure/

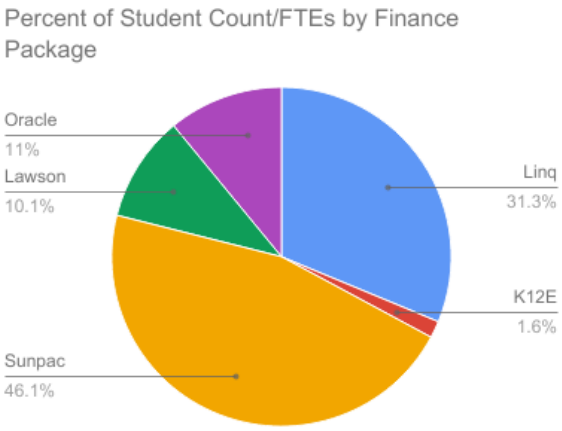
Modern ERP and reporting systems must link to the NC Licensure environment. Licensure status and years of service directly affect salary as reflected in the salary schedule[8] for certified positions (i.e., teachers, principals, school psychologists). In a modern environment, an ERP platform would interact with the licensure system via contemporary Internet protocols to verify years of service before issuing a paycheck. Related reporting systems would interact with the licensure system through standards-based interfaces and protocols.

Ideally, the licensure system would be part of a larger Human Capital Management (HCM) system that includes the entire employment cycle from applicant tracking through employee evaluation, professional development and license renewal. A broader HCM solution would also include similar functionality for non-licensed positions. This type of system can greatly enhance the effectiveness of the organization by ensuring employees are placed in positions that best meet their skills and professional goals, while satisfying the needs of the LEA. Coupling the evaluation with professional development and other HR software functions ensures the effective management of all staff, and can help identify employee performance issues earlier rather than later.

[8] http://www.ncpublicschools.org/docs/fbs/finance/salary/schedules/2016-17schedules.pdf

MODERNIZATION APPROACH

Modernization of reporting systems requires a review of UERS and NCSBE policies that drive the manner, collection, and dissemination of fiscal, employee, and student data. This review should drive the requirements for the design and implementation of a data integration service and an advanced analytics and data reporting service. The data integration service should ultimately leverage contemporary protocols and interfaces to extract data from authoritative data sources and load that data in an automated fashion into analytics, reporting, and data visualization platforms. Initially, LEA finance packages may feed the data service based on established file formats and processes – with specifications for more contemporary interfaces defined in the RFP for a modern ERP service and required of legacy finance package providers in the future. The data service should be nimble enough to add additional sources and analytics algorithms – allowing for new questions, reports, and business intelligence approaches.



Licensure modernization requires a comprehensive business process review, a peer review of other NC licensing systems and of other state education licensing systems, and a market scan of contemporary licensing solutions and human capital management approaches. The results of the reviews and market scan should be documented in a comprehensive human capital management plan. The plan should present details for transitioning to, and sustaining, a modern HCM environment that comprises an integrated system that links applicant tracking, licensure, educator evaluation, and professional development.

ERP modernization cannot be one-size-fits-all but instead must consider current finance package, number of third-party integrations, total staff, and the general complexity of the LEA environment. It may be neither practical nor feasible to implement a single ERP solution across all LEAs and charter schools. The size difference alone between the smallest LEAs and charter schools with under 100 full-time equivalent positions (FTE) and the largest LEAs with near 15,000 FTE makes it difficult to find a single ERP solution that can be economically applied across the education enterprise. The distribution of FTE across finance packages also affects the procurement approach as discounting will scale with FTE and nearly 22% of the FTE in the State are represented in WCPSS and CMS. By contrast, 51% of LEAs use the Linq finance package, but these LEAs represent only 31% of the FTE. Finally, transitioning the business system that affects payroll is an intrusive process that requires substantial planning and change management that is individualized on a per-LEA and charter school basis. Focusing on individual LEA and charter school transition plans will be important to the overall success of the project and will require staging that could stretch program implementation over six years or more.

Costs for implementation and licensing and subscription costs vary widely across vendors in the K-12 business system marketplace. The modeling presented here incorporates cost data that are based on non-bonding estimates provided by private sector providers likely to respond to an ERP request for proposals. Software as a Service (SaaS) ERP implementation and subscription costs are based a high-end solution that can scale to support WCPSS and CMS.

To capture the characteristics that impact cost, time and effectiveness, we considered dozens of scenarios in calculating the expected expenses of ERP transition. The following table shows a small number of the scenarios modeled for the development of this report.

Scenario		Total ERP Conversion Costs	New annual ERP SaaS subscription Cost	LEA Count on SaaS	FTE Count on SaaS	LEA Count on legacy	FTE Count on Legacy	Conversion Cost per ADM
1	ALL on SaaS	$222M	$21.7M	115	135K	0	0	$149
2	Largest 30 Sunpac, 10 Linq, K12E, & CMS, WCPSS	$129M	$18.2M	43	106K	72	29K	$87
3	Largest 30 Sunpac, 10 Linq, K12E	$112M	$14.8M	41	77K	74	58K	$76
4	All LEAs with >2000 FTE	$99M	$14.6M	16	75K	99	60K	$66
5	All LEAs with >1000 FTE	$123M	$17.8M	35	102K	80	33K	$83
6	All LEAs with >750 FTE	$138M	$19.1M	47	112K	68	23K	$93

We chose a pragmatic approach to modeling various possible scenarios, taking into account the diverse needs of the 115 LEAs. For example, the smallest 50 LEAs combined have about the same number of employees as the single largest LEA. Thus, we recognize that it is unlikely that a single ERP solution would meet the needs of all LEAs, while being most cost effective for the taxpayers. To that end, we modeled many different scenarios and found a cloud-based Software as a Service (SaaS) solution to be most cost effective and likely to be successfully deployed in a reasonable amount of time for about 30 to 40 of the largest LEAs. We assume the remaining smaller LEAs will continue to use or migrate to a traditional Microsoft-based solution that is already UERS benchmarked. In the model we acknowledge that even the currently available Microsoft-based solutions are not fully modernized to the scale and level of reporting and integration that we believe the State ultimately requires. Therefore, some budget items are enumerated in this report for the purposes of ensuring parity across both the Microsoft-based solutions and whatever new ERP system is ultimately procured for the larger LEAs.

Additionally, in keeping with a pragmatic and realistic implementation schedule, we avoid changing many systems all in the same year and instead attempt to leverage newly procured systems for as long as possible while focusing on updating the most outdated systems first. Some policy changes and legislative changes could reduce the difficultly of implementation and increase the use of available commercial-off-the-shelf software. Example of these polices include the 21.5 day work month and the use of cash-basis rather than accrual-basis accounting.

Scenarios 2 and 5 are cost optimized in terms of obtaining the scale needed to attract a world-class SaaS solution vendor to implement North Carolina-specific functionality, while keeping costs in check. Many of the features provided by a large ERP are simply not needed in a small LEA with under a few hundred employees. An initial goal of modernization is to immediately reduce the dependence on the IBM iSeries platform and associated software, moving to platforms and technologies that were introduced this century. For various reasons, most of the LEAs still on the Sunpac/iSeries solution are the larger LEAs, thus it follows that the first priority is to meet the needs of the larger LEAs.

Wake County Public Schools and Charlotte-Mecklenburg Schools are the outliers in that they employ custom-configured financial packages provided by large multinational technology systems companies – Oracle and Infor Lawson. It is not known, and cannot be known until a solution is selected, if these mega-districts will find value in a migration in the next 5 years. Both WCPSS and CMS are at some point in a software lifecycle that may or may not be cost effective to alter at this point, because of various fixed costs and contracts. Regardless, the procurement should consider these mega-districts as being in scope and it is likely that these two LEAs have implemented custom software that an enterprise ERP could also easily provide.

One the other end of the spectrum are the smaller LEAs, many with fewer than 500 employees. These LEAs might be best suited to maintain the current finance package and for the State to commission the addition of key features that allow efficient centralized reporting, modern software interfaces, and some enhancements that improve the fidelity and timeliness of data from the LEAs to NCDPI. Ultimately, we chose to model in detail a scenario where the 43 largest LEAs move to the new SaaS ERP solution while the remaining 72 LEAs remain on, or move to, a Microsoft-based solution. At implementation time, it may be that only 20 LEAs need the scale provided by the SaaS solution. Just as likely is the possibility that the SaaS solution may be so attractive that more LEAs decide to switch to it.

A three- or five-year contract for an ERP solution is likely not cost effective. The migration alone will take many years. Thus, it is suggested that NCDPI, DIT and the General Assembly recognize the depth of the commitment to a solution and consider contracts with multiple extensions as well as clearly defined data export formats. As we evaluate the cost of migrating to the new SaaS solution today, it is clear that a uniform data export format would reduce costs, when the time comes to move to the next solution years from now.

Several other scenarios are summarized in the table on the previous page to demonstrate that, given current assumptions and knowledge of available SaaS offerings, the most effective solution is likely to include about 40 LEAs moving to the new SaaS ERP platform. There are cost and price dynamics involved that drive this conclusion. For example, seat costs (or per FTE licenses) are based on the number of employees across the entire state that are using the system. The more LEAs that sign up, the lower the cost for everyone in this model. Migration costs to the new system are based slightly on the size of the LEA. However, the base cost for the migration, irrespective of size, is likely to exceed $1 million. It would be difficult to justify spending $1 million on an ERP migration for an LEA that only has a $20 million annual payroll. For this reason, we propose enhancing the currently available UERS benchmarked solution already in use in many LEAs to provide a data integration and reporting interface that is on par with the SaaS solution.

Another expense that is articulated in the budget is that of the “template”. This expense involves business systems consultants understanding the processes in use at NCDPI and the LEAs and mapping

the business logic of many systems to the new SaaS platform. During the course of this process it is likely that these consultants will find many instances where efficiency can be gained by changing the way LEAs and NCDPI do business. Resistance to change could result in a more costly implementation or opportunity cost in terms of continuing the status quo at a higher operational cost. It is impossible to model this, but important to point out that the final cost will be dependent on the flexibility of LEAs and NCDPI.

ESTIMATED BUDGET AND TIMELINE

Modernizing the business systems supporting public education will require careful and comprehensive planning and design, supported by a dedicated program management office (PMO). Informed by comprehensive plans, the PMO will manage a myriad of contracts and procurements. The most expensive and complicated procurement will be for contemporary ERP platform(s) and services supporting LEA and charter school payroll, HR, and finance systems. Several legacy NCDPI-managed systems and services will need to be modified and improved in the short term to facilitate future integrations and system replacements. The table below represents a summary of estimated expenses based on a 5-year program.

Estimated Expense	FY2017-18	FY2018-19	FY2019-20	FY2020-21	FY2021-22
Program management office	1,426,650	1,411,750	1,463,052	1,550,594	1,539,411
GDAC & FI Planning and Design	500,000	507,500	515,225	523,182	531,377
ERP implementation	3,000,000	15,950,000	37,500,000	37,500,000	35,500,000
ERP service	-	2,740,000	8,106,000	14,745,000	18,295,000
Reporting implementation	3,000,000	-	3,000,000	-	-
Reporting service	-	-	1,680,000	1,680,000	1,680,000
Licensure implementation	-	-	750,000	6,000,000	-
Licensure service	-	-	1,000,000	1,000,000	1,000,000
Legacy DPI systems investments	2,116,438	1,080,000	1,080,000	-	-
Totals	$ 10,043,088	$ 21,689,250	$ 55,094,277	$ 62,998,775	$ 58,545,789

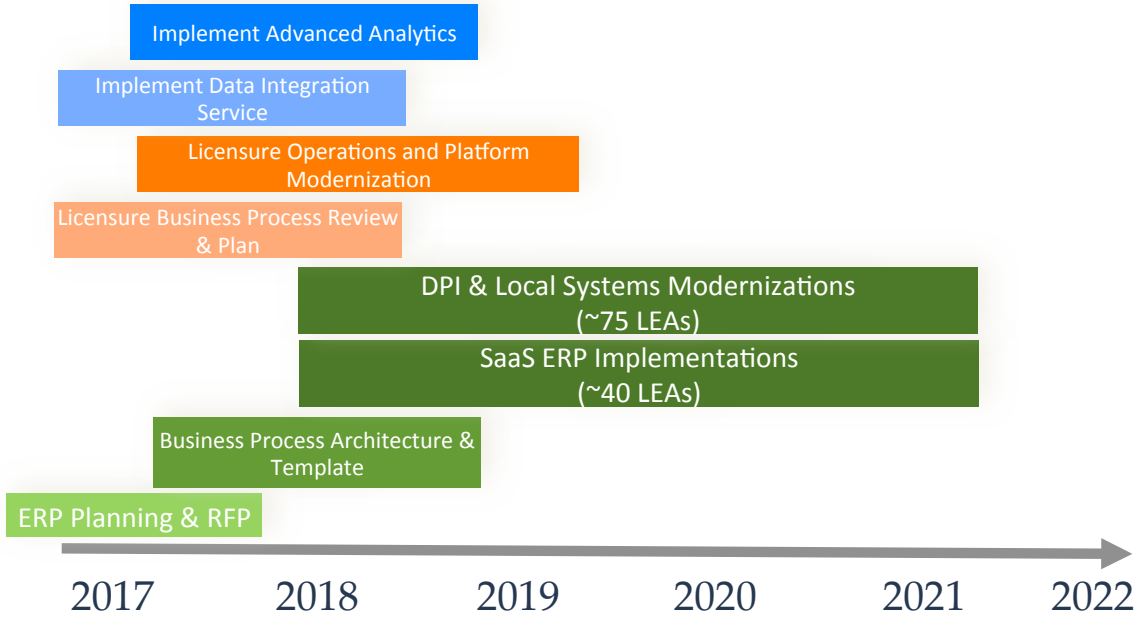
The statewide approach summarized in the budget above is based on ERP scenario 2 – transitioning the largest LEAs, including WCPSS and CMS, to a SaaS solution, while updating remaining solutions to meet modern ERP and reporting goals. Since this approach incorporates expenses required to transition WCPSS and CMS, it also incorporates the benefit of scale that comes with the largest two LEAs as well. Any of these approaches will require establishment of a project management office and will have substantially similar funding requirements in the 2017-19 biennium due to front end planning and integration of a new ERP platform.

Summarized expenditures are defined as follows:

- **Program management office**: A program director, three project managers, and nine analysts. Cost estimates are based on a July 1 starting date for the director, August 1 for the project managers, and September 1 for the analysts. This line also includes travel supplies and materials. Specifically, expense for a computer and peripheral costs for PMO staff and travel across North Carolina supporting implementation. Travel also includes potential trips to meet with exemplar states and related organizations.
- **GDAC and FI Planning and Design**: State agreements with the Friday Institute (FI) at NC State University and with the NC Government Data Analytics Center (GDAC). The FI provides leadership to NCDPI in the planning and design of complex IT systems and the GDAC provides data sharing and integration support.
- **ERP implementation**: Costs of transition to a modern ERP environment, including migrations to SaaS solutions for larger LEAs and upgrades to existing platforms and business processes for remaining LEAs.
- **ERP service**: Subscription costs for newly procured SaaS solutions.

- **Reporting implementation**: The development and deployment of a data integration service that extracts data from financial, HR, licensure, student information, and related systems. Reporting implementation also includes development of mechanisms for loading the most current data into target analytics, business, intelligence, and data visualization systems.
- **Reporting service:** Licensing, and subscription costs for data integration and analytics services.
- **Licensure implementation:** Business process review and planning related to licensure and human capital management at the State level. Implementation here also includes development of modern interfaces for data exchange and deployment of modern licensure and HCM upgrades.
- **Licensure service:** Licensing and subscription costs for enhanced or newly procured licensure systems.
- **Legacy NCDPI systems investments:** iSeries hosting and HRMS subscription fees currently paid by LEAs. This line also includes expenses related to enhancing NCDPI salary and auditing systems.

Cost estimates here are based on pre-planning research of vendors and service providers in the education business system marketplace. Comprehensive planning will provide better estimates – though many procurement details can affect actual pricing.

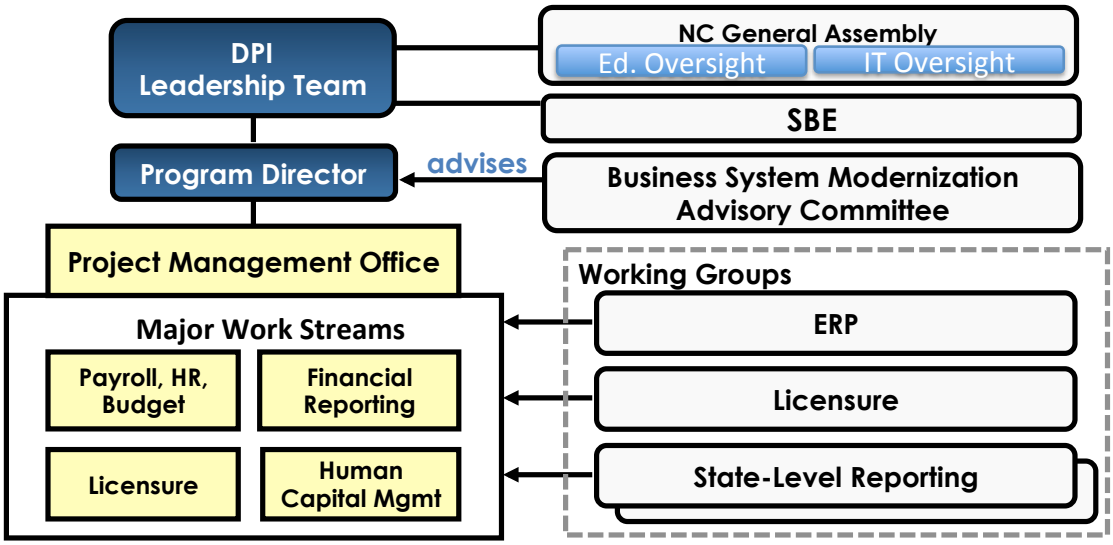


The above timeline shows parallel work streams for ERP, reporting (data integration and analytics), and licensure. ERP planning and RFP development have already begun at a high level but will require dedicated staff and prioritized attention to manage an RFP process that is required by session law to begin no later than October 1, 2017. As the ERP process moves into contract negotiations, the PMO must direct attention to business process architecture and the development of a NC-based template instance of the winning ERP service. Implementation and transition of ERP systems begins in earnest in FY2018 and continues for at least four years. Reporting work begins in early FY2017 and includes development of data integration and advanced analytics capabilities built as decision support tools – targeting 30 months to full deployment. Licensure business process review and planning begins in early

FY2017 and will require a 12 to 18 month process. In mid-FY2017, work begins on Licensure integrations and platform modernizations consistent with specifications defined in the ERP RFP and in the data integration service plan.

ORGANIZATION AND COLLABORATION

In order to manage a program of the scope and complexity required and to implement with fidelity, the State must build an effective BSM organization supported by inclusive advisory and leadership structures. Stakeholders, including LEAs, NCDPI and the General Assembly must be coordinated in the goals of the program. All stakeholders can receive benefits from the successful deployment of these modern business systems.



The advisory and leadership approach illustrated above has been used for other large-scale enterprise technology deployments including the School Connectivity Initiative, the NC Education Cloud, and the NC Digital Learning Plan. The business system modernization advisory committee advises a program director, and will include representation from stakeholders including:

- LEA superintendents
- LEA Chief Finance and HR officers
- Charter school leaders
- General Assembly
- Office of the Superintendent of Public Instruction
- Department of Public Instruction
- Department of IT
- Office of State Budget Management

RECOMMENDATIONS FOR THE 2017-2019 BIENNIUM

Work on the business system modernization program has already begun. The NC Association of School Business Officers (NCASBO) has established a committee to develop requirements for a modern ERP system. The Personnel Administrators of NC (PANC) designated the Human Resource Management System (HRMS) steering committee to provide leadership in defining HR requirements for a modern ERP system. NCDPI has begun work on modifying existing systems to support transitions in reporting and auditing. Friday Institute leadership have facilitated pre-planning conversations with the vendor community, GDAC, LEAs that have made a recent ERP transition, CFOs, HR executives, technology directors, and related stakeholders.

S.L. 2016-94 SECTION 8.15(c) requires that the State Board of Education and the Friday Institute issue a "*Request for Proposal to outside vendors and entities for implementation of the plan*" by October 1, 2017. The BSM program will likely require several RFPs, though the first should be for a SaaS based ERP system for NC LEAs. In order to release an RFP by October, substantial planning and orchestration must begin immediately and a funding approach must be established. The summary budget calls for funding of $31.7M in biennium. We recommend fully funding the estimated biennial budget and providing guidance related to State support and expectations for the BSM program.

SUPPORTING DOCUMENTATION

Highlights of the North Carolina School Budget [February 2017] can be found at the link below.
http://www.dpi.state.nc.us/docs/fbs/resources/data/highlights/2017highlights.pdf

Developing a Data Integration Service for NC Education Cloud [May 2012] can be found at the link below.
http://cloud.fi.ncsu.edu/projects/disdiagrams/20120520.nc.rttt.di.plan.v4.0.pdf

Report on iSeries-Based Business Processes and Interactions [August 2012], provided upon request.

Human Resources Systems Modernization Report [November 2012], provided upon request.

State ERP Progress Report, report to the Joint Legislative Oversight Committee on Information Technology and to the Fiscal Research Division of the NC General Assembly [February 15, 2017], provided by NC DIT.

Progress on the Community Colleges System ERP Design and Implementation, report to the Joint Legislative Oversight Committee on Information Technology and to the Fiscal Research Division of the NC General Assembly [January 15, 2017] can be found at the link below.
http://www.ncleg.net/DocumentSites/committees/JLOCIT/Agency Reports to the General Assembly/2017/NC Community Colleges ERP Status Report January 2017.pdf

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The NC Association of School Business Officers (NCASBO), the HRMS Steering Committee, and NCDPI finance and business services and technology staff have contributed valuable insights to the creation of this report and will be foundational partners in the development of future plans and RFPs and in the implementation, deployment, and operations of modern business systems. Special appreciation to:

NCASBO School Business Modernization Committee

Angie Henry	Guilford County	Co-Chair
Clyde Locklear	Cumberland County	Co-Chair
Kathy Horky	NCDPI	Member
Gwendolyn Tucker	NCDPI	Member
Jay Tolan	Scotland County	Member
Freyja Cahill	Brunswick County	Member
Karla Miller	Catawba County	Member
Dan Karpinski	Union County	Member
Aaron Beaulieu	Durham County	Member
Heidi Kerns	Rutherford County	Member
Ken Chilcoat	Hyde County	Member
Mary Hazel Small	New Hanover County	Member
Kerry Crutchfield	Winston-Salem Forsyth	Member
Shelia Shirley	Charlotte-Mecklenburg	Member
Jenny Billings	NCASBO Executive	Member

HRMS Steering Committee

Steve Foster	Guilford County	Chair	Region 5
Brian Propst	Buncombe County	Co-Chair	Region 8
Michelle Maddox	Edenton-Chowan	Member	Region 1
C.J. Korenek	Onslow County	Member	Region 2
Rick Walthall	Wilson County	Member	Region 3
Mendee Daniel	Cumberland County	Member	Region 4
Jill Near	Charlotte-Mecklenburg	Member	Region 6
Christy Parker	Watauga County	Member	Region 7
Dave Fairall	Lexington City	Member	At-Large
Ashley Duckworth	Gaston County	Member	At-Large
Sherri Thomas	Guilford County	Member	At-Large
Clyde Locklear	Cumberland County	Liason	NCASBO

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