

Broward County Public Schools Information & Technology Plan



January 2014

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Introduction Overview



The Information & Technology (I&T) Strategic Plan for Broward County Public Schools (BCPS) provides a road map for the deployment of technology to support the District's overall strategic goals over the next three to five years

This plan sets out to accomplish the following:

- To describe the vision and mission for technology deployment in the District
- To define the key technology objectives needed to support the District's three strategic goals of high quality instruction, continuous improvement and effective communications
- To assess where the District is today and provide recommendations to meet District goals
- To identify a set of prioritized strategic initiatives and technology investments and a road map for implementation over the next three to five years

This plan was developed over a three month period by the Chief Information Officer (CIO) with guidance from the I&T Strategic Planning Advisory Council and Gartner Consulting

The information needed to develop this plan was gathered through:

- Extensive interviews with internal and external school District stakeholders: principals, teachers, students, District staff and administrators, external community members and business partners
- Two District-wide surveys: Teacher Survey (1,432 responses), Student Survey (9,599 responses)
- Internal I&T User Applications Survey: 91 responses received (76% response rate)
- Workshops with the Technology Advisory Council, the I&T Strategic Planning Advisory Council and I&T staff

Introduction

I&T Strategic Planning Advisory Council Members



District Committee Chair Representatives

Dr. Joel Levine (Technology Advisory Committee Chair)

Jodi Klein (District Advisory Committee)

Jeanne Jusevic (Diversity Committee)

Teachers

Carin Ramirez (Teacher, Lyons Creek Middle School)

Candice Fleming (Teacher, Harbordale Elementary)

Beatriz Ramirez (Teacher, Flanagan High School)

Principals

Camille Pontillo (Principal, Coral Park Elementary School)

Jack Vesey (Principal, Westglades Middle School)

John LaCasse (Principal, Nova High School)

David Watkins (Principal, Whiddon-Rogers Edu. Center)

Andrew Bronstein (Assistant Principal, Margate S.T.E.M. Magnet Middle School)

Community Members and Industry Partners

Lois Greene (Community Member)

Lakshman Charanjiva (CIO of FPL)

Ben Slivka (Industry Partner)

Instruction and Interventions Department

Jose Dotres (CAO)

Dr. Jeanine Gendron (STEM & Instructional Resources)

Dr. Leonid Rabinovich (STEM & Instructional Resources, Blended Learning Team)

Audit Department

Mark Magli (Manager, Property & Inventory Control)

Talent Development

Bethany Fee (Talent Development, Professional Development Support)

Information & Technology

Tony Hunter (CIO, I&T)

Myra Burden (Technology Planning & Policy)

Angela Coluzzi (Network Integration)

Doug Pearce (Technical Support Services)

Gartner Consulting

David Irwin, Michael Kinara, Vasya Dostoinov

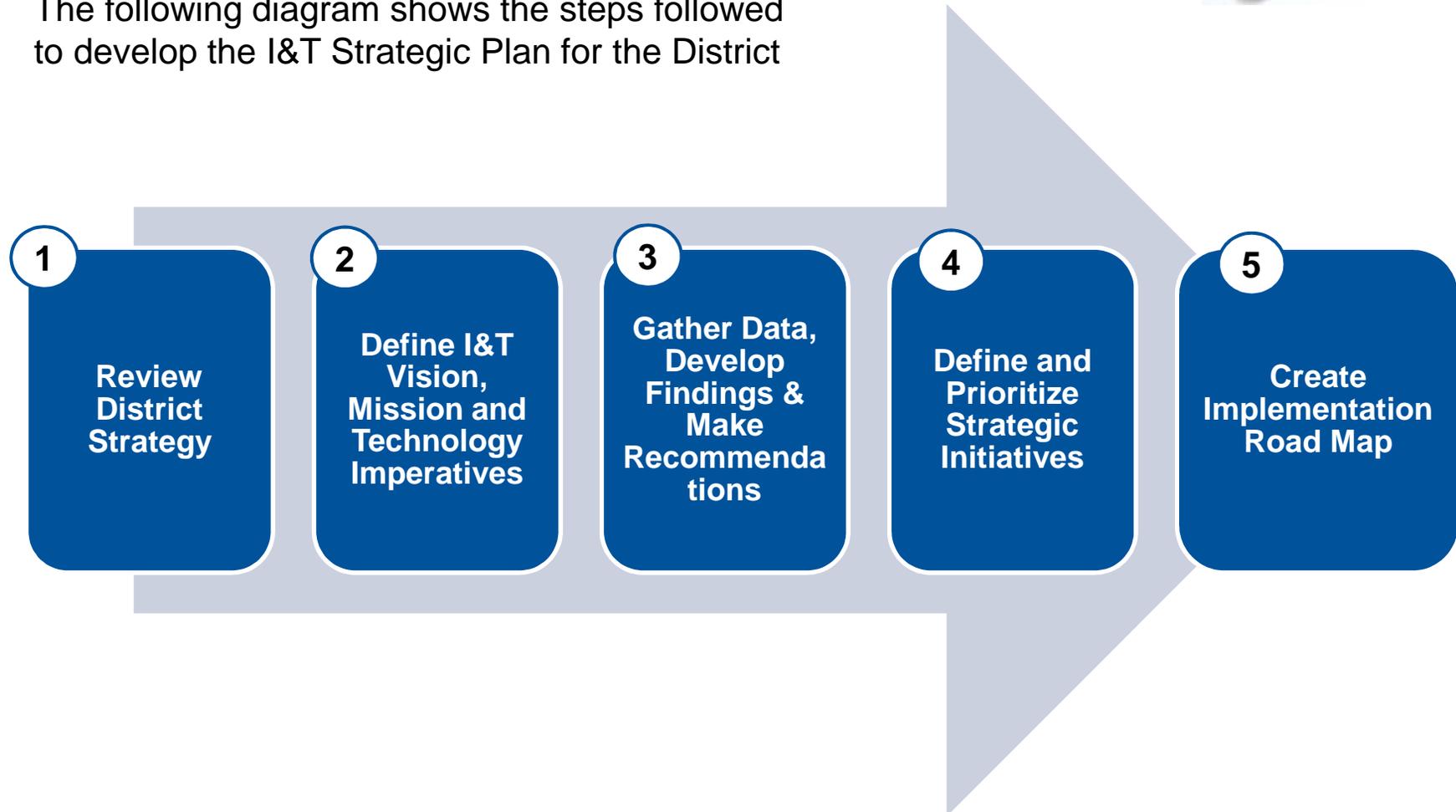
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Introduction

I&T Strategic Planning Approach

The following diagram shows the steps followed to develop the I&T Strategic Plan for the District



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Future State

I&T Vision and Mission

I&T Planning Assumptions

I&T Goals Aligned to District Strategic Goals



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I&T Vision and Mission

The I&T vision and mission represents the ideal future and purpose of technology deployment at the District

Broward County Public Schools I&T Vision

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Broward County Public Schools I&T Mission

To proactively provide current, sustainable and resilient information technology needed to facilitate high quality instruction, continuous improvement and effective communications across the District



Technology Strategic Planning Assumptions

The following assumptions underpin the successful execution of the I&T Strategic Plan

- 1. A Clear Direction For Personalized Learning in The District Is Being Developed.** The Plan has identified key technology initiatives that depend on a well thought out direction for personalized learning path at the District.
- 2. A Commitment to Continual Technology Refresh Supported by Sustainable Funding Practices Will Be in Place.** Work will go into identifying sustainable funding from multiple sources (e.g., capital budget, general operations budget, federal grants, e-rate programs, partnerships with business community, etc.) This would ensure adequate capital and operational funding for new and ongoing technology refresh.
- 3. A High Performance I&T Organization Is Maintained Through Effective I&T Staff Recruitment, Transition and Succession Planning.** Over the next three to five years many knowledgeable I&T staff will be eligible to retire. Execution of the Strategic Plan is dependent on an I&T organization that can continue to recruit, train and make seamless transitions to new personnel.
- 4. A Commitment to Continuous Improvement through Ongoing Professional Development.** With each major initiative key staff members (teachers, administrators, support and technical) should be provided with professional development necessary to maximize the District's return on investment and meet the ultimate goal of improving student achievement.
- 5. Development of Project Management Capabilities to Implement the Initiatives.** The Technology Planning and Policy Office will build the requisite project management capabilities to successfully oversee the execution of the initiatives described in this Plan.
- 6. Annual Updates to the Strategic Plan.** While the outlook for the Strategic Plan is three to five years, the plan will be updated annually to ensure it remains flexible in meeting changing needs. Key strategic shifts will be discussed and approved through the appropriate I&T governance structure.



Technology Imperatives Aligned to District Goals (1 of 2)

The following strategic technology imperatives represent the most important strategic actions regarding the technology implementation over the next three to five years to meet BCPS's strategic goals. These imperatives provide the guidance needed by the District to make decisions regarding what specific technology initiatives and projects to deploy. They are aligned to the District's three strategic goals.

Technology Will Support Goal 1: High-Quality Instruction By:

1. Providing the technology that enables the transformation of teaching and learning through personalized learning
2. Providing technology to ensure effective and continuous provision of professional development through online, blended and face-to-face options designed to deliver learning opportunities that integrate technology, curriculum and pedagogy
3. Maintaining a consistent and sustainable baseline standard of technology infrastructure and support in every school that is accessible by every student and is continually updated
4. Meeting the specialized technical requirements of District education programs such as magnet schools, ESE programs, ESOL/ELL programs, Virtual Schools, Adult Education, Career Technical Education and STEM.
5. Providing access to the breadth and depth of student information and instructional decision-making data maintained at the classroom level, school-level and District-level in a user friendly and secure manner
6. Developing and maintaining close collaborative relationships between academic and I&T operational areas

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Technology Imperatives Aligned to District Goals (2 of 2)

Technology Will Support Goal 2: Continuous Improvement By:

1. Increasing District-wide productivity through increased administrative efficiency enabled by reliable technology systems to all schools and within all departments
2. Providing departments, parents, students, and the community user friendly access to student and administrative data and information to positively impact administrative and academic decision making at all levels within the District
3. Supporting District-wide operational resiliency through effective security practices, disaster preparedness and business continuity planning
4. Building and utilizing effective project management practices to ensure timely, cost-effective and quality deployment of academic, administrative and technological projects
5. Assessing and aligning I&T staff resources, partnerships and third party contracts to facilitate timely delivery and support of technology initiatives

Technology Will Support Goal 3: Effective Communication By:

1. Ensuring a reliable and secure core communications infrastructure for the District — telephony, data networks, video, and web services
 2. Providing a technology platform that supports community engagement and collaboration (this includes parent engagement and education, business partnerships and community relationships)
 3. Supporting innovative use of technology for District-wide communication, e.g., use of social media and social collaboration platforms
 4. Deploying a platform for the communication of student and administrative data and information to those that need it
 5. Providing technology tools that enable robust but user friendly analytics
-

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Strategic Plan Implementation Road Map

Key Strategic Directions and Associated Technology Initiatives

Prioritized Initiatives Implementation Time Frame

High-Level Technology Investment Estimate



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Strategic Direction and Initiatives

Goal 1: Support High Quality Instruction (Slide 1 of 2)

This section presents the key strategic recommendations based on Gartner's assessment of the current environment and input from District stakeholders. The recommendations are implemented through actionable initiatives

Information & Technology Strategy Directions	Strategic Initiatives
<p>1. Invest in critical next generation core technology infrastructure needed to meet the District's needs over the next five years</p> <ul style="list-style-type: none"> a) Increase wired and wireless bandwidth capability in all schools and administrative offices b) Built necessary storage, server and backup systems c) Refresh outdated computers and technology in all schools and administrative offices d) Define strategy for bring-your-own-device (BYOD) programs (dependent on personalized learning strategy and infrastructure capacity) e) Provide focused assistance to students who need network connectivity outside the school <p>2. Based on personalized learning strategy, support effort to equip and configure classrooms with the necessary peripheral/supporting technology and equipment</p> <ul style="list-style-type: none"> a) Define personalized learning technology and equipment requirements and develop a plan for classroom updates <p>3. Define sustainable refresh strategy for technology infrastructure and digital resources that accounts for the Total Cost of Ownership (TCO)</p> <ul style="list-style-type: none"> a) Well defined plan to identify TCO of investments and plan to identify funding from multiple sources (capital budget, general operations budget, grants, e-rate programs, partnerships with business community, etc.) 	<ul style="list-style-type: none"> 1. District-wide Wireless Network Infrastructure Upgrade 2. District Core Central Technical Infrastructure Capacity Upgrade 3. Virtual Desktop Project (VDI) — Enables Anywhere Desktop Access 4. School Computer Refresh Initiative 5. Digital Classroom Peripheral Technology and Upgrade Project 6. Digital Divide Connectivity Program



Strategic Direction and Initiatives

Goal 1: Support High Quality Instruction (Slide 2 of 2)

Information & Technology Strategy Directions	Strategic Initiatives
<p>4. Implement common platform for access to instructional content, assessments and applications enabled by a single sign-on</p> <ul style="list-style-type: none">a) Implement a single robust student and teacher portal for instructional content, data and transactional applications that integrates efficient single-sign <p>5. Define staffing strategy to support infrastructure and education technology integration</p> <ul style="list-style-type: none">a) Support integrated technology and curriculum professional development for teachers and staffb) Formalize a three-tier technology support program for District schools which would address the roles for (1) a media specialist; (2) an I&T support specialist (for general support — Microtech); (3) an instructional technology specialist. (Note: strategy will define how these roles are fulfilled in schools considering limited resources)	<ul style="list-style-type: none">7. Single Sign-on and Portal Development Project8. Integrated Technology Professional Development Program9. School Technology Support Enhancement Initiative

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Strategic Direction and Initiatives

Goal 2: Enable Continuous Improvement (1 of 4)



Information & Technology Strategy Directions	Strategic Initiatives
<ol style="list-style-type: none"> 1. Enhance District efficiency through support of more automated shared services <ol style="list-style-type: none"> a) Automation of paper-based processes — e.g., end-of-period accounts receivable, payroll processes, transcripts requests and access, report cards generation and distribution b) Consolidated process that are currently duplicated across the district, e.g., print services 2. Streamline asset management across the District using automated tools and business processes <ol style="list-style-type: none"> a) Build a business case and implement a modern inventory management tool that is flexible, easy to access and enables real-time updating and auditing of assets 3. Leverage potential economies of scale through well-coordinated technology licensing and contract management services <ol style="list-style-type: none"> a) Reduce redundancies and enable better Instructional Application Licensing and Contract Management across all schools 4. Enable access to integrated student and administrative data that is currently maintained in siloed/standalone systems <ol style="list-style-type: none"> a) Continue the strategy of providing integrated and user friendly access to student related data from multiple sources b) Enhance data warehouse capabilities and implement user friendly dashboard and query tools c) Implement system to allow student, parent and teacher access to and use of formative and summative assessment data 	<ol style="list-style-type: none"> 1. District Shared Service/Business Process Automation Initiative 2. Asset Management Initiative 3. Coordinated Vendor License and Contract Management Program 4. Integrated Data Strategy Program

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Strategic Direction and Initiatives

Goal 2: Enable Continuous Improvement (2 of 4)



Information & Technology Strategy Directions	Strategic Initiatives
<p>5. Reduce cost and increase efficiency through application rationalization within I&T and move to greater use of commercially available applications to mitigate against legacy software development skills shortage in the future</p> <ul style="list-style-type: none"> a) Examine applications still on legacy platforms that can be consolidated and whose functionality can be combined in newer, more functional systems (e.g., on SAP or other systems) <p>6. Migrate district systems off current mainframe platforms</p> <ul style="list-style-type: none"> a) Current SAP environment relies on a “non-legacy” IBM mainframe to support the SAP database instance. Migration will avoid the mainframe skills gap expected in about 5 years b) Appropriate time and investment in training will be needed for the SAP Basis staff and system administrators to effectively support the refreshed SAP system platform c) IBM VSE mainframe maintenance costs are expected to be very high. Migrating off the VSE based mainframe would eliminate the operational cost spending d) Limited skills exist to support the IBM VSE environment. A skills gap is expected in about 5 years and migration planning should begin immediately to ensure availability of key resources during an actual migration effort 	<ul style="list-style-type: none"> 5. Application Rationalization Initiative 6. Mainframe phase out for SAP and other legacy application hosting

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Strategic Direction and Initiatives

Goal 2: Enable Continuous Improvement (3 of 4)



Information & Technology Strategy Directions	Strategic Initiatives
<p>7. Implement a modernized Student Information System (SIS) to replace TERMS and other ancillary systems. Functionality potentially includes:</p> <ul style="list-style-type: none"> • Student Data/Demographics • Registration and Enrollment • Scheduling • Attendance • Gradebook or Gradebook Integration • Grades and Transcripts • Special Education • Behavior Records • School Fee Management • Health and Medical Records • Teacher Portal • Parent and Student Portal • Administrator Portal • State Reporting • Standard and Ad Hoc Reporting • Data Analysis and Assessment • Language Support • Other Capabilities: <ul style="list-style-type: none"> ○ Data Warehouse ○ Transportation ○ Nutrition Programs <p>8. Implement a District-wide Digital Learning Platform (DLP) to support Personalized Learning. Functionality potentially includes:</p> <ul style="list-style-type: none"> • Content Access • Curriculum/Content Management • Design and Development • Curriculum User Evaluation • Learning/Student Management • Instructional Design • Plan Book/Lesson Plans • Gradebook Integration • Portfolio Management • Online Assessments • Class Data Management • Assessment Capabilities • Item Creation and Storage • Scoring • Results Processing • Professional Development • Individual Development Plans • Staff Development Plans • Collaboration Tools 	<p>7. Student Information System Modernization Program</p> <p>8. Digital Learning Platform Implementation Program</p>

Strategic Direction and Initiatives

Goal 2: Enable Continuous Improvement (4 of 4)



Information & Technology Strategy Directions	Strategic Initiatives
<p>9. Optimize information technology organization structure to be less internally siloed and more customer-oriented</p> <ul style="list-style-type: none"> a) Enable a less siloed cross-functional processes and structure b) Enhance roles for business relationship managers <p>10. Update Current Disaster Recovery and Business Impact Analysis</p> <ul style="list-style-type: none"> a) This is critical as the District relies more on technology. These plans have not been updated in a while and need to be addressed to ensure they meet current and future requirements <p>11. Clearly define an I&T governance structure that will focus on consistent technology decision making across the District:</p> <ul style="list-style-type: none"> a) Strategic governance: technology strategy, policy, major technology investment funding b) Operational governance: funding allocation, priority setting, resource management, project oversight and monitoring c) Technical governance: establishment of technology standards, coordination of infrastructure, forum for collaboration between the District and individual school information technology departments d) Utilize the above governance structure to work with technical schools to ensure mutually beneficial deployment of technology <p>12. Develop technology management baseline guidance for school principals</p> <ul style="list-style-type: none"> a) Computing device guidance, technology funding practices b) Instructional application options c) Student management guidance on issues like cyber bullying, etc. d) Available District capabilities of technology support/vendor management e) Catalog of available technology tools and services 	<ul style="list-style-type: none"> 9. I&T Realignment Program 10. Disaster Recovery and Business Impact Analysis 11. Technology Governance Project 12. School Technology Baseline Education Specifications Project

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Strategic Direction and Initiatives

Goal 3: Facilitate Effective Communications



Information & Technology Strategy Directions	Strategic Initiatives
<ol style="list-style-type: none"> 1. Develop and execute a plan to provide students with email addresses and access to a collaboration platform <ol style="list-style-type: none"> a) Recommend cloud-based student email and collaboration platform b) Work with school stakeholders to develop email acceptable use policies, etc. 2. Continue to make telephony upgrades at schools and administrative offices <ol style="list-style-type: none"> a) This involves converting remaining buildings to Voice over IP (VoIP) infrastructure 3. Conduct parent and community technology education and outreach <ol style="list-style-type: none"> a) Develop, implement, or leverage existing venues to communicate technology objectives and plans to the wider BCPS stakeholders (e.g., parents, community groups, etc.) 4. Develop partnerships with the business community <ol style="list-style-type: none"> a) Opportunities for student technology funding and sponsorship b) Technology internships, etc. 5. Enhance flexibility for schools to manage individual school websites and provide basic services while maintaining common look and feel across the District. <ol style="list-style-type: none"> a) Online events and payments b) Student, teacher and parent portal access 	<ol style="list-style-type: none"> 1. Student Email and Collaboration Platform Initiative 2. Community Technology Outreach Program (Parents, Business Community, etc.) 3. School Website Enhancement Program

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Strategic Plan Implementation Road Map

Strategic Initiatives Aligned to District Strategic Goals



The diagram shows the alignment of the strategic initiatives to the three District strategic goals

	Strategic Initiative	High Quality Instruction	Continuous Improvement	Effective Communications
1	District-wide Computer Refresh	X	X	X
2	I&T Portfolio Governance		X	
3	Teacher & Support Staff PD	X		
4	Wireless Network Upgrade	X		
5	Core Infrs. Upgrade	X		
6	SAP Gap & Imp		X	
7	Digital Learning Platform	X	X	X
8	Student & Staff Email	X		X
9	Digital Divide Connectivity	X		X
10	Community Outreach			X
11	Disaster Recovery & BIA		X	
12	Desktop Anywhere (VDI)	X		
13	I&T Realignment		X	
14	Asset Mgmt System		X	
15	SIS Replacement	X	X	X
16	Integrated Data Strategy	X	X	X
17	Digital Classroom Technology	X		
18	Technology Ed. Specs. Baseline	X		
19	License & Contract Consolidation		X	
20	Business App. Rationalization		X	
21	District Shared Services		X	
22	Mainframe Phase-out		X	
23	Unified Portal (Single Sign-On)		X	
24	Legacy Business Apps. Migration		X	
25	School Website			X

Strategic Plan Implementation Road Map

Strategic Initiative Prioritization Methodology



Ranking Definitions:

- **Impact:** Degree to which the results of an initiative will impact the success of instructional, financial, strategic goals.
- **Urgency:** Time in which results or change is needed from an initiative
- **Challenge:** Degree of difficulty to implement an initiative due to financial, resource or external

Prioritization Process

- The I&T Strategic Planning Advisory Council Members provided input into the strategic initiative prioritization.
- Each initiative's priority score is the sum of its impact and urgency scores
- Both the impact and the urgency scores have a 1–5 scale, where “5” is very high and “1” is very low. E.g., an initiative with score of “5” for impact and “5” for urgency will have a total priority score of “10”
- Each initiative is then assigned a challenge score on a scale of 1–3, where “3” is very challenging and “1” is less challenging

Strategic Plan Implementation Road Map

Initiative Implementation Time Frame



This chart displays the high-level time frame for the deployment of the identified initiatives over the next three to five years (plan will be updated annually). The start of individual initiatives is determined by the relative priority of the initiative.

Strategic Initiative		Impact	Urgency	Challenge	Priority	2014				2015				2016				2017			
						Q1	Q2	Q3	Q4												
1	District-wide Computer Refresh	5	5	3	↑ 10.0	█	█	█	█												
2	I&T Portfolio Governance	5	4.7	2	↑ 9.7	█	█														
3	Teacher & Support Staff PD	4.5	4.5	2	↑ 9.0	█	█														
4	Wireless Network Upgrade	5	4	3	↑ 9.0	█	█														
5	Core Infrs. Upgrade	5	4.5	2	↑ 9.5	█	█														
6	SAP Gap & Imp	4.5	4.25	2	↑ 8.8	█	█	█													
7	Digital Learning Platform	4.5	4	3	↑ 8.5	█	█														
8	Student & Staff Email	4	4.5	3	↑ 8.5	█	█														
9	Digital Divide Connectivity	5	3	1	→ 8.0					█	█	█	█								
10	Community Outreach	3.5	4.5	1	→ 8.0	█	█														
11	Disaster Recovery & BIA	4	4	2	→ 8.0					█	█	█	█	█							
12	Desktop Anywhere (VDI)	4.5	3.5	3	→ 8.0	█	█														
13	I&T Realignment	4	3.5	1	→ 7.5	█	█														
14	Asset Mgmt System	4	3.25	2	→ 7.3									█	█	█	█				
15	SIS Replacement	5	2	3	→ 7.0									█	█	█	█				
16	Integrated Data Strategy	4	3	3	→ 7.0		█	█													
17	Digital Classroom Technology	3.5	3.5	3	→ 7.0			█	█												
18	Technology Ed. Specs. Baseline	3.5	3	1	→ 6.5	█															
19	License & Contract Consolidation	4	2	1	→ 6.0	█	█														
20	Business App. Rationalization	2.5	3.5	2	→ 6.0									█	█						
21	District Shared Services	3.5	2.3	2	↓ 5.8	█	█														
22	Mainframe Phase-out	3	2.5	3	↓ 5.5									█	█	█	█				
23	Unified Portal (Single Sign-On)	3.5	1.5	2	↓ 5.0									█	█	█	█				
24	Legacy Business Apps. Migration	3	2	2	↓ 5.0									█	█	█	█				
25	School Website	2	2	1	↓ 4.0			█	█												

Strategy & Planning Phase	Requirements Gathering &or System Selection Phase	Initiative Implementation/Project Execution Phase
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Strategic Plan Implementation Road Map

Initiatives: Prioritized based on Impact and Urgency

Definitions:

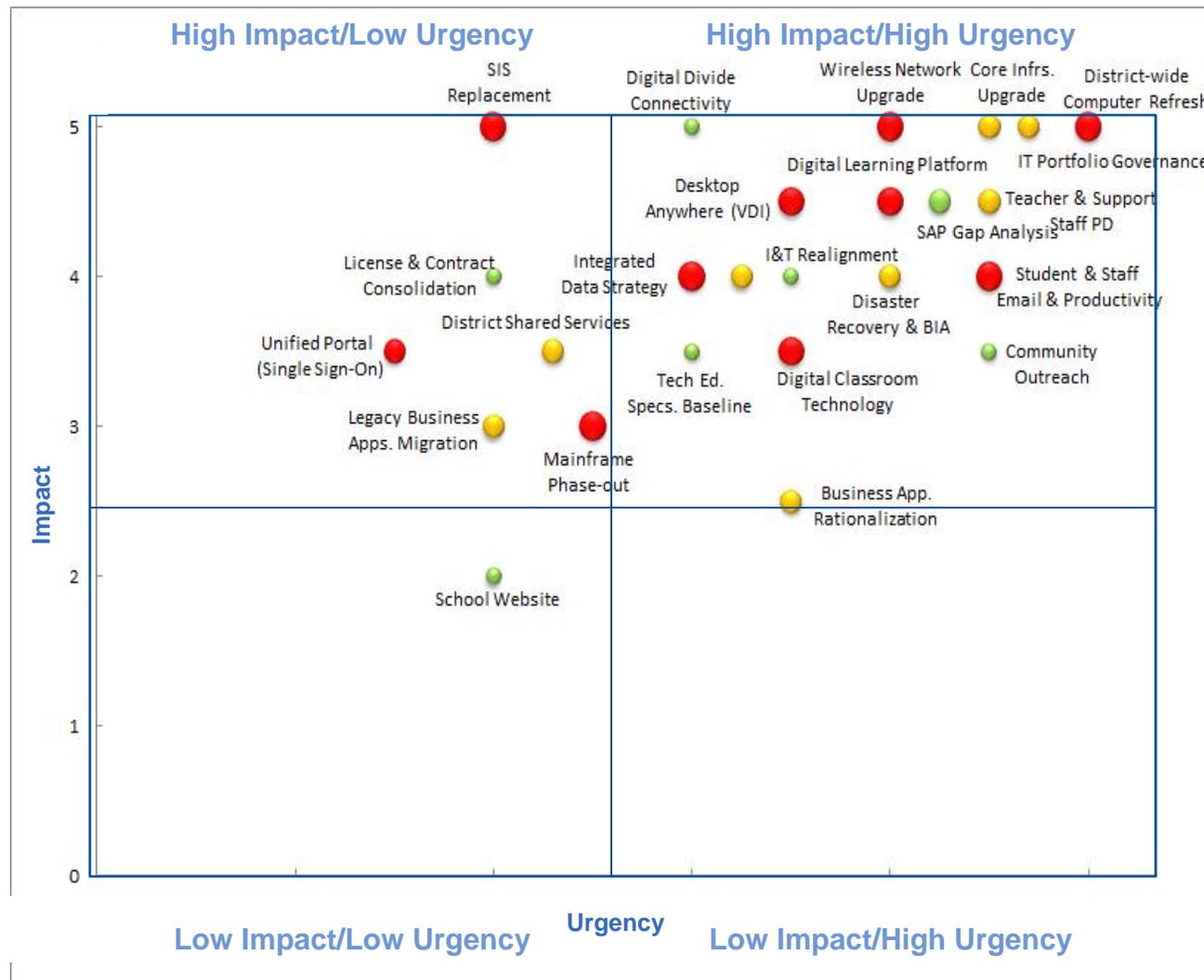
Impact: Degree to which the results of an initiative will impact the success of instructional, financial, strategic goals.

Urgency: Time in which results or change is needed from an initiative

Challenge: Degree of difficulty to implement an initiative due to financial, resource or external

Legend:

- High Implementation Challenge Projects
- Medium Implementation Challenge Projects
- Low Implementation Challenge Projects





High-Level 5 Year Strategic Technology Investment Estimate

Strategic Initiative						Estimated Cost	
		Impact	Urgency	Challenge	Priority	Low	High
1	District-wide Computer Refresh	5	5	3	↑ 10.0	\$ 47,666,667	\$ 65,000,000
2	I&T Portfolio Governance	5	4.7	2	↑ 9.7	\$ -	\$ -
3	Teacher & Support Staff PD	4.5	4.5	2	↑ 9.0	\$ 17,900,000	\$ 26,850,000
4	Wireless Network Upgrade	5	4	3	↑ 9.0	\$ 17,000,000	\$ 20,000,000
5	Core Infrs. Upgrade	5	4.5	2	↑ 9.5	\$ 47,000,000	\$ 60,000,000
6	SAP Gap & Imp	4.5	4.25	2	↑ 8.8	\$ 10,000,000	\$ 12,000,000
7	Digital Learning Platform	4.5	4	3	↑ 8.5	\$ 6,900,000	\$ 9,200,000
8	Student & Staff Email	4	4.5	3	↑ 8.5	\$ 500,000	\$ 1,000,000
9	Digital Divide Connectivity	5	3	1	→ 8.0	\$ 2,152,800	\$ 4,305,600
10	Community Outreach	3.5	4.5	1	→ 8.0	\$ -	\$ -
11	Disaster Recovery & BIA	4	4	2	→ 8.0	\$ 200,000	\$ 250,000
12	Desktop Anywhere (VDI)	4.5	3.5	3	→ 8.0	\$ 8,500,000	\$ 12,000,000
13	I&T Realignment	4	3.5	1	→ 7.5	\$ -	\$ -
14	Asset Mgmt System	4	3.25	2	→ 7.3	\$ 1,000,000	\$ 1,500,000
15	SIS Replacement	5	2	3	→ 7.0	\$ 9,100,000	\$ 11,850,000
16	Integrated Data Strategy	4	3	3	→ 7.0	\$ 1,700,000	\$ 2,350,000
17	Digital Classroom Technology	3.5	3.5	3	→ 7.0	\$ 25,000,000	\$ 35,000,000
18	Technology Ed. Specs. Baseline	3.5	3	1	→ 6.5	\$ -	\$ -
19	License & Contract Consolidation	4	2	1	→ 6.0	\$ -	\$ -
20	Business App. Rationalization	2.5	3.5	2	→ 6.0	\$ 250,000	\$ 300,000
21	District Shared Services	3.5	2.3	2	↓ 5.8	\$ 3,000,000	\$ 5,000,000
22	Mainframe Phase-out	3	2.5	3	↓ 5.5	Included in 5	Included in 5
23	Unified Portal (Single Sign-On)	3.5	1.5	2	↓ 5.0	\$ 4,000,000	\$ 7,000,000
24	Legacy Business Apps. Migration	3	2	2	↓ 5.0	\$ 1,000,000	\$ 1,500,000
25	School Website	2	2	1	↓ 4.0	\$ 100,000	\$ 200,000
					Total	\$ 202,969,467	\$ 275,305,600

The strategic investment represents a high-level view of the potential funding needed to execute these initiatives over the next three to five years. This equates to a range of about \$200 to \$275 million over five years (not including the cost of existing internal resources or additional hires who would work on these initiatives).

Decisions on the execution of each new initiative should be vetted through the recommended governance structure and should be based on a business case, ROI analysis and other factors such as funding availability.

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Appendix

Detailed Initiative Descriptions



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Detailed Initiative Descriptions



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Strategic Plan Implementation Road Map

Initiative Implementation Time Frame

This chart displays the high-level time frame for the deployment of the identified initiatives over the next three to five years (plan will be updated annually). The start of individual initiatives is determined by the relative priority of the initiative.

Strategic Initiative		Impact	Urgency	Challenge	Priority	2014				2015				2016				2017			
						Q1	Q2	Q3	Q4												
1	District-wide Computer Refresh	5	5	3	↑ 10.0	█	█	█	█												
2	I&T Portfolio Governance	5	4.7	2	↑ 9.7	█	█														
3	Teacher & Support Staff PD	4.5	4.5	2	↑ 9.0	█	█														
4	Wireless Network Upgrade	5	4	3	↑ 9.0	█	█														
5	Core Infrs. Upgrade	5	4.5	2	↑ 9.5	█	█														
6	SAP Gap & Imp	4.5	4.25	2	↑ 8.8	█	█	█													
7	Digital Learning Platform	4.5	4	3	↑ 8.5	█	█														
8	Student & Staff Email	4	4.5	3	↑ 8.5	█	█														
9	Digital Divide Connectivity	5	3	1	→ 8.0					█	█	█	█								
10	Community Outreach	3.5	4.5	1	→ 8.0	█	█														
11	Disaster Recovery & BIA	4	4	2	→ 8.0					█	█	█	█	█	█						
12	Desktop Anywhere (VDI)	4.5	3.5	3	→ 8.0	█	█														
13	I&T Realignment	4	3.5	1	→ 7.5	█	█														
14	Asset Mgmt System	4	3.25	2	→ 7.3									█	█	█	█				
15	SIS Replacement	5	2	3	→ 7.0									█	█	█	█				
16	Integrated Data Strategy	4	3	3	→ 7.0		█	█													
17	Digital Classroom Technology	3.5	3.5	3	→ 7.0			█	█												
18	Technology Ed. Specs. Baseline	3.5	3	1	→ 6.5	█															
19	License & Contract Consolidation	4	2	1	→ 6.0	█	█														
20	Business App. Rationalization	2.5	3.5	2	→ 6.0									█	█						
21	District Shared Services	3.5	2.3	2	↓ 5.8	█	█														
22	Mainframe Phase-out	3	2.5	3	↓ 5.5									█	█	█					
23	Unified Portal (Single Sign-On)	3.5	1.5	2	↓ 5.0									█	█	█	█				
24	Legacy Business Apps. Migration	3	2	2	↓ 5.0									█	█	█					
25	School Website	2	2	1	↓ 4.0			█	█												

Strategy & Planning Phase	Requirements Gathering &or System Selection Phase	Initiative Implementation/Project Execution Phase
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Initiative 1 — District-wide Computer Refresh Initiative

Project Description

This initiative seeks to replace all outdated computers in schools and administrative offices over a period of 18 months followed by a consistent ongoing refresh cycle that will replace District-wide computers on a regular schedule. This initiative includes any one-to-one student computing ratio activities

Business Benefits/Rationale	Estimated Time Frame and Estimated Cost																																				
<ul style="list-style-type: none"> Ensures students have access to computers that help them acquire the technology skills required for college and career readiness Ensures student have access to computers that can handle personalized learning and instructional software requirements Ensures students have access to computers that meet common core curriculum for technology skills and online assessment requirements 	<p>START Ongoing Effort -----></p> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th colspan="4">2014</th> <th colspan="4">2015</th> <th colspan="4">2016</th> </tr> <tr> <th>Qtr 1</th><th>Qtr 2</th><th>Qtr 3</th><th>Qtr 4</th> <th>Qtr 1</th><th>Qtr 2</th><th>Qtr3</th><th>Qtr 4</th> <th>Qtr 1</th><th>Qtr 2</th><th>Qtr3</th><th>Qtr 4</th> </tr> </thead> <tbody> <tr> <td style="background-color: red;">█</td><td style="background-color: blue;">█</td><td style="background-color: green;">█</td><td style="background-color: green;">█</td> <td style="background-color: green;">█</td><td style="background-color: green;">█</td><td style="background-color: green;">█</td><td style="background-color: green;">█</td> <td style="background-color: green;">█</td><td style="background-color: green;">█</td><td style="background-color: green;">█</td><td style="background-color: green;">█</td> </tr> </tbody> </table> <p>Estimated Cost: \$48–\$65 million over 5 years</p>	2014				2015				2016				Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr3	Qtr 4	Qtr 1	Qtr 2	Qtr3	Qtr 4	█	█	█	█	█	█	█	█	█	█	█	█
2014				2015				2016																													
Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr3	Qtr 4	Qtr 1	Qtr 2	Qtr3	Qtr 4																										
█	█	█	█	█	█	█	█	█	█	█	█																										

Activities

- Develop computer replacement and refresh plan that:
 - Determines standard computing device configurations based on student needs and grade levels
 - Establishes criteria for determining computing refresh priorities (i.e., which schools or grades to upgrade in priority order)
 - Determine replacement and refresh schedules
- Establish ongoing computer refresh budget and funding streams and review current computing device vendor pricing, contacts and licenses
- Begin implementation of replacement computers based on established plan

Critical Success Factors/Key Performance Indicators	Dependencies
<ul style="list-style-type: none"> Understanding of true cost for replacement and ongoing maintenance of computing devices Consistent multiyear computer refresh funding stream Buy-in from school principals and teachers on refresh priorities and support requirements 	<ul style="list-style-type: none"> Establishment of District-wide support and maintenance structure for computing environment Development of District-wide personalized learning strategic plan

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Initiative 2 — Technology Governance Project

Project Description

This project aims to clearly define an I&T governance structure that will focus on consistent technology decision making across the District

Business Benefits/Rationale	Estimated Time Frame and Estimated Cost											
<ul style="list-style-type: none"> Improved decision making and customer service An existing approval framework that facilitates agreement, collaboration and transparency An effective mechanism to articulate I&T strategy and initiatives that fosters efficiency and cost effectiveness through collaboration 	START				END							
	2014				2015				2016			
	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4
Estimated Cost: None												

Activities

- Develop committee charters for the following governance bodies: (1) Strategic governance: technology strategy, policy, major technology investment funding; (2) Operational governance: funding allocation, priority setting, resource management, project oversight and monitoring; (3) Technical governance: establishment of technology standards, coordination of infrastructure, forum for collaboration between the District and individual school information technology departments
- Establish roles and responsibilities
- Receive approval of the charter from the School Board
- Build governance principles, decision frameworks and shared service development guidelines in collaboration with EPMO
- Establish CIO membership across other governance committees
- Establish sub-committee structures as appropriate (e.g., BI, security)

Critical Success Factors/Key Performance Indicators	Dependencies
<ul style="list-style-type: none"> Formal charter, roles and processes for the governance committees are written and adopted Governance committee members represent key areas, namely BCPS I&T, business office, technical coordinators, teachers and principals. Roles are filled by senior staff with the authority to provide strategic leadership and organization support 	<ul style="list-style-type: none"> I&T Realignment Program



Initiative 3 — Teacher & Support Staff Professional Development

Project Description

This program will develop and execute a training plan for teacher and technology support staff. It would be an integrated professional program that trains on how to pedagogy changes with technology. It would blend curriculum, technology resource and student management techniques.

Business Benefits/Rationale	Estimated Time Frame and Estimated Cost											
<ul style="list-style-type: none"> Ensures that high quality instruction is enabled by technology through delivery of comprehensive support to teachers and staff on using technology in the everyday classroom Ensures that measurable improvements in student achievement are visible 	START END											
	2014				2015				2016			
	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4
Estimated Cost: \$17–\$27 million over 5 years												

Activities

- Develop and execute a detailed training plan that would cover the following areas:
 - Device Specific Training (On Specific New Standardized Devices):** How to use the these computing devices in a classroom setting including common productivity applications and classroom and device management strategies
 - Support for Microtechs, computer teachers, and media specialists:** Includes device specific configuration, administration and support — In-depth for standardized devices.
 - Pedagogy and leadership of technology infused classroom instruction:** Pedagogy of technology infused classroom instruction, where has it been successful, models of organizing students, time, and space (one computer classroom, clusters of computers, 1-1- and blended learning models relevant here), relationship to Marzano
 - School leadership and management of technology infused classroom instruction:** Leadership strategies for supporting and monitoring technology infused classrooms, observation protocols and rubrics, relationship to Danielson
 - Professional development and coaching strategies:** Coaching and support strategies and tools, working with teachers, strategies for supervising and supporting teachers and students in using technology, best practices in evaluating the effectiveness of technology
- Implement PD in cooperation with school principals over five year period.

Critical Success Factors/Key Performance Indicators	Dependencies
<ul style="list-style-type: none"> Priority given to developing a comprehensive and executable plan that is ongoing plan integrated will all other teacher PD Dedicated funding and time given to professional development 	<ul style="list-style-type: none"> Development of District-wide personalized learning strategic plan Completion of technology replacement and refresh plan.



Initiative 4 — School Wireless Network Upgrade

Project Description

The goal of this project is to enhance the wireless network infrastructure in all schools within Broward County in order to meet the technological specifications required for new technology requirements (e.g., online assessments and personalized learning)

Business Benefits/Rationale

- Creates improved wireless network flexibility and scalability to meet growing bandwidth requirements
- Helps achieve educational and business objectives in all schools within Broward County Public School District

Estimated Time Frame and Estimated Cost



Estimated Cost: \$17– \$20 million over 5 years

Activities

- Establish business, I&T and wireless network requirements for the technology-infused academic/personalized learning using a three-tier upgrade framework (i.e., legacy wireless network upgrades, infrastructure device upgrades, and software upgrades)
- Measure user satisfaction and productivity improvement against business case and acceptable criteria; establish road map for the District-wide deployment
- Design a robust wireless network architecture
- Begin to deploy upgraded wireless infrastructure across the district

Critical Success Factors/Key Performance Indicators

- Documentation of academic improvements to be supported by wireless network infrastructure improvements in District schools
- Comprehensive District-wide network architecture and deployment design

Dependencies

- Formalized business and I&T requirements
- Updated wide-area and Internet vendor contracts
- Infrastructure monitoring and management processes and reporting
- Upgraded capacity of the District's core central technical infrastructure

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Initiative 5 — District Core Central Technical Infrastructure Capacity Upgrade

Project Description

This project aims to modernize the core network infrastructure, physical end-user device management and data center facility environment with a focus on providing appropriate scale, performance, availability and serviceability to meet the District business and academic requirements

Business Benefits/Rationale

- Creates scalability to meet growing bandwidth requirements
- Helps achieve educational and business objectives in all schools within Broward County School District

Estimated Time Frame and Estimated Cost

2014				2015				2016			
Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4
START				END							
Estimated Cost: \$47–\$60 million											

Activities

- Define a hosting strategy for more stable data center facilities
- Conduct mainframe phase-out activities (initiative 22)
- Update the data center technology and infrastructure
- Review and update the cabling infrastructure as needed based on network analysis to gain better understanding of network traffic patterns and associated operational and functional requirements
- Procure and upgrade network hardware in schools per the newly developed network architecture and the technology refresh cycle
- Measure and communicate performance requirements as part of the district-wide deployment design process
- Update network workload and discovery details to populate asset management database and infrastructure monitoring platform with newly deployed hardware

Critical Success Factors/Key Performance Indicators

- Clear documentation of network bandwidth and technical requirements
- Reliable data center facility — power and cooling — to establish reliable network infrastructure

Dependencies

- Updated wide-area and internet service provider vendor contracts
- Infrastructure monitoring and management processes and reporting

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Initiative 6 — SAP Gap Analysis and Implementation

Project Description

The objective of this project is to (1) carry out a gap analysis of existing SAP capabilities with the goal of determining which additional SAP functionality may be leveraged in order to help the District achieve its business objectives and (2) Based on the gap analysis begin to roll-out new SAP functionality to meet application needs

Business Benefits/Rationale

- Leverages existing SAP capabilities
- Potentially improves business processes
- Eliminates process redundancies and duplications

Estimated Time Frame and Estimated Cost

▼ START				END ▼							
2014				2015				2016			
Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4

Estimated Cost: \$10–\$12 million

Activities

- Understand current use of SAP use (assessment of business objectives and technical/business benefits; integration with critical applications; review design)
- Define desired future state which should include activities like integration with other applications, SAP capabilities, SAP governance, SAP architectural style, technical requirements. The result would be a functional gap analysis
- Based on the gap analysis, determine which additional functionalities are needed and determine if the functionality is part of an existing BCPS SAP portfolio
- Begin process of implementing new SAP functionality to meet application needs

Critical Success Factors/Key Performance Indicators

- Decisions about the purchased but “dormant” SAP modules are made
- SAP users are consulted and buy-in from relevant stakeholders is achieved
- Business process are optimized

Dependencies

- Decisions about the upgrade of the asset management system are taken into consideration

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Initiative 7 — Digital Learning Platform (DLP) Implementation

Project Description

This initiative will involve the development of a project plan for the deployment of a Digital Learning Platform (DLP). It will also include all the steps to deploy the DLP for use across the District. A DLP is a software system designed to deliver, track, report on and manage learning content, learner progress and learner interactions and can be used for students, teacher and administrators.

Business Benefits/Rationale

- Improves and streamlines teaching administration processes and easily tracks the progress of students individually on a day-to-day basis
- Offers a variety of teaching approaches by delivering engaging and motivating training that can be scaled for a wider reach out to a large number of learners
- Facilitates easy and secure exchange of learning data
- Delivers flexible access by students to training resources, multiple learning channels and multiple media formats

Estimated Time Frame and Estimated Cost

▼ START				END ▼							
2014				2015				2016			
Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4

Estimated Cost: \$6.9–\$9.2 million over 5 years

Activities

- Determine lessons learned from current DLP deployment as part of Digital Five Initiative
- Document additional DLP business requirements for supporting teacher PD
- Update business case for use of current pilot DLP
- Review long-term contract and license terms
- License or subscribe to an approved DLP and begin implementation of an expanded rollout

Critical Success Factors/Key Performance Indicators

- Close coordination with school and District academic leadership
- Appropriate Service Level Agreement and contract terms established for software delivery services (software as a service model)

Dependencies

- None

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Initiative 8 — Student and Staff Email and Productivity Tools

Project Description

This project aims to replace the current District email system with cloud-based email services , collaboration and productivity tools accessible by both staff and students.

Business Benefits/Rationale	Estimated Time Frame and Estimated Cost											
<ul style="list-style-type: none"> Creates potential significant savings for BCPS as a result of migrating to a cloud-based email service from an internally hosted solution Offers other advantages of cloud email deployments such as automated vendor-supplied upgrades, redeployment of I&T staff, email boxes with large capacity and built-in disaster recovery services 	▼ START				END ▼							
	2014			2015				2016				
	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4
Estimated Cost: \$0.5–\$1 million initial cost												
Activities												
<ul style="list-style-type: none"> Develop email migration plan Select a migration implementation partner with ample experience with Office 365 (the District’s preferred product) Clean up the old email system prior to migration (junk and non-essential email) Conduct extensive end-user communication, training and support activities Ensure network remediation, such as adding points of presence and prioritizing network traffic to ensure smooth transition to cloud email Deploy new email system based on migration plan 												
Critical Success Factors/Key Performance Indicators	Dependencies											
<ul style="list-style-type: none"> Evaluation of cloud email services using six core criteria: economics, infrastructure alignment, features, migration effort, support/SLAs, security/legal/privacy 	<ul style="list-style-type: none"> None 											



Initiative 10 — Community Outreach

Project Description																																					
<p>The goal of this project is to create a formal venue for BCPS to communicate the progress and implementation of I&T strategic initiatives to the District's stakeholders (e.g., parents, community organizations, etc.) in an effort to retain buy-in and community support</p>																																					
Business Benefits/Rationale	Estimated Time Frame and Estimated Cost																																				
<ul style="list-style-type: none"> Creates a venue for BCPS to regularly communicate with the Broward County community Keeps parents and guardians informed about critical I&T-related decisions impacting their children and their education 	<p>START END</p> <p>▼ ▼</p> <table border="1"> <thead> <tr> <th colspan="4">2014</th> <th colspan="4">2015</th> <th colspan="4">2016</th> </tr> <tr> <th>Qtr 1</th><th>Qtr 2</th><th>Qtr 3</th><th>Qtr 4</th> <th>Qtr 1</th><th>Qtr 2</th><th>Qtr 3</th><th>Qtr 4</th> <th>Qtr 1</th><th>Qtr 2</th><th>Qtr 3</th><th>Qtr 4</th> </tr> </thead> <tbody> <tr> <td style="background-color: red;">█</td><td style="background-color: green;">█</td><td></td><td></td> <td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td> </tr> </tbody> </table> <p>Estimated Cost: None</p>	2014				2015				2016				Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	█	█										
2014				2015				2016																													
Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4																										
█	█																																				
Activities																																					
<ul style="list-style-type: none"> Establish a committee that will be responsible for developing the outreach strategy Validate strategy with the appropriate internal BCPS stakeholders Implement strategy Review and revise strategy at regular intervals 																																					
Critical Success Factors/Key Performance Indicators	Dependencies																																				
<ul style="list-style-type: none"> The wider Broward County community has a defined method to communicate and offer feedback about BCPS's technology initiatives BCPS compiles and reviews the solicited and unsolicited feedback on a regular basis and reports findings to the community 	<ul style="list-style-type: none"> None 																																				



Initiative 11 — Update Disaster Recovery Plan Based on a Business Impact Analysis (BIA)

Project Description

This project focuses on updating the BCPS strategy for disaster recovery management based on complete Business Impact Analysis (BIA). The activities involved in I&T DRM are: network recovery, hardware recovery, desktop recovery, software recovery, data recovery, telecommunications recovery, and information security recovery all based on administrative and academic expectations

Business Benefits/Rationale

- Optimizes a recovery approach and minimizes extended downtime from a disaster as a result of having a well-defined disaster recovery management strategy based on expectations that are defined by the school District administrators

Estimated Time Frame and Estimated Cost

START												END											
2014				2015				2016															
Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4												
Estimated Cost: \$200K–\$250K																							

Activities

- Complete a BIA (Business Impact Assessment)
 - Identify the scope of the core applications BCPS wants to consider for the DR plan
 - Create a small team to conduct the BIA. Team should be comprised of technical, administrative and academic personnel. Work with this team to identify application criticality and impact to business in the event of an outage
 - Update the Recovery Time and Point Objectives (RTOs and RPOs) of each application and the associated dependencies for each application
 - Document the findings in the form of a BIA
- Update the current Disaster Recovery Strategy based on the BIA
 - Assess application architecture and associated technical infrastructure relative to the defined RTO and RPOs from the BIA
 - Categorize applications into appropriate groups ranging from applications that are architected to meet their RTO/RPO requirements to application that fall outside of their RTO/RPO requirements (based on current state application & infrastructure architecture).
 - Address the High Availability (HA) application gaps and the standby application gaps. Leverage clustering technologies, load balancing and synchronous data replication for HA application where possible.
 - Develop investment plan as needed to bridge current state application availability gaps

Critical Success Factors/Key Performance Indicators

- Engaging the proper I&T, administration and academic users and leaders to accurately understand application recovery tolerance
- Maintaining a complete and updated BIA,
- Maintaining the I&T-DRM strategy as living document

Dependencies

- Disaster Recovery Management is one component under business continuity management. A Business Continuity Management plan should be defined first (as guidance to the DRM plan) that includes all business operations and non-I&T recovery activities



Initiative 13 — Realign and Define I&T Organization

Project Description

The objective of this project is to realign the current I&T organization to improve the efficiency, quality, and customer satisfaction

Business Benefits/Rationale

- Shapes the organization to become more flexible and responsive to shifting District requirements
- Increases productivity through better alignment of skills and competencies to service delivery capabilities
- Uses organizational design best practices to define an effective future state that takes into account the evolving I&T strategy
- Separates operational work from development project work

Estimated Time Frame and Estimated Cost

START				END							
▼				▼							
2014				2015				2016			
Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4

Estimated Cost: None

Activities

- Map current state to target state organization structure including new or existing jobs
- Based on mapping, perform activities related to defining the organization design structure
- Perform transition planning activities related to starting the overall transition process
- Perform activities related to change management

Critical Success Factors/Key Performance Indicators

- Efficiency — Does pursuit of efficiency opportunities require reorganization or simply project/process work?
- Effectiveness — Are shortfalls in effectiveness the result of lack of engagement, underfunding or structural deficiencies? Does the structure need to change, or do new functions, capabilities or people simply need to be added to enhance effectiveness?
- Productivity — Are projects adhering to time, cost and quality measures?
- Managing change — What structural or personnel changes are needed?
- Interweaving Structure and Governance in I&T Management and the I&T Organization

Dependencies

- Ensure roles and responsibilities for all I&T processes are created and documented before determining realignment requirements

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Initiative 14 — Asset Management System

Project Description

This initiative includes development of an overall plan for upgrading the District’s asset management system and processes. It will streamline asset management across the District using automated tools and business processes. The initiative will build a business case for modern inventory management tool that is flexible, easy to access and enables real-time updating and auditing of assets

Business Benefits/Rationale	Estimated Time Frame and Estimated Cost											
<ul style="list-style-type: none"> Enables assessment of management processes that reduce workload on school leadership Enhances accounting and management of the District’s assets, decreases operational costs to maintain asset information, and creates more cost-effective audit processes 	2015*				2016				2017			
	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4
	Estimated Cost: \$1–\$1.5 million initial cost (Note: timescale starts in 2015)											

Activities

- Determine business process improvements for streamlining District-wide asset management operations
- Define key functional and technical system requirements
- Assess potential systems in relation to desired business process improvements and key functional requirements
- Procure and implement a new asset management system

Critical Success Factors/Key Performance Indicators	Dependencies
<ul style="list-style-type: none"> Buy-in from key stakeholders that includes internal audit and school leadership 	<ul style="list-style-type: none"> Application rationalization SAP System Gap Analysis



Initiative 15 — Student Information System (SIS) Modernization Program

Project Description

Replace TERMS as a District-wide SIS. This would involve a detailed examination of the effort, time and cost for such a program and a comparison against the potential long-term strategic benefits to the District. Based on the business case, the appropriate SIS solution will be determined and implemented as part of this program

Business Benefits/Rationale	Estimated Time Frame and Estimated Cost											
<ul style="list-style-type: none"> Reduce risk of outdated technology and loss of experienced staff Ability to consistently keep up with technology improvements through a defined path for system upgrades and technology enhancements. Greater business process efficiency through the automation of manual/unintegrated student administration systems and processes Enhanced ability to respond to business changes through a highly configurable systems that does not require complicated programming Improved user responsiveness through the deployment of Web-enabled, self-service capabilities Significantly enhanced student information/data management to support operational and policy decision making 	▼ START END ▼											
	2014				2015				2016			
	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4
Estimated Cost: \$9.1–\$11.9 million over 5 years												

Activities

- Builds a business case to outline the rational, benefits, risks, and implementation costs and total cost of ownership of a new SIS.
- Determine the appetite for change among stakeholders and willingness to commit to, support and execute such a program
- Develop business and technical requirements
- Craft a Request for Proposal and select a SIS product and system integrator to implement the system
- Begin phased implementation of modernized SIS

Critical Success Factors/Key Performance Indicators

- Ensure system-wide stakeholder involvement in the study obtain the approval of the business case
- Objective business case & systems requirements development

Dependencies

- Student data strategy completed

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Initiative 16 — Integrated Data and Analytics Program

Project Description

Through this project, BCPS will formulate a fully attributed and integrated data analytics program for both student and business system/operational data (information governance, organization and roles, information life cycle, enabling infrastructure) that contains a set of actionable (prioritized, dependent, leveled, and time-phased) recommendations to develop the target state. This will then be followed by activities to execute and start producing integrated data that meets the District's requirements

Business Benefits/Rationale	Estimated Time Frame and Estimated Cost											
<ul style="list-style-type: none"> Improves student data quality, accessibility, reliability, and facilitates data decision-making Reduces duplication of data and to improve reporting Increases trust in data as measured by confidence in the department responsible for student data management Increases accountability for data reliability and quality 	▼ START				▼ END							
	2014				2015				2016			
	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr3	Qtr 4	Qtr 1	Qtr 2	Qtr3	Qtr 4
Estimated Cost: \$1.5–\$2 million												

Activities

- Establish the underlying BCPS need for student and administrative data, establish a common understanding of its data capabilities, and assess them against best practices
- Based on academic needs, formulate the associated data goals and develop the target state. Establish a comprehensive view of the current and target state components required for achieving BCPS' goals and identify activities to bridge the gaps
- Develop a road map laying out the major sequence of activities and events to implement the desired target state as well as provide implementation design
- Begin implementation of the program

Critical Success Factors/Key Performance Indicators	Dependencies
<ul style="list-style-type: none"> Clear documentation of the all needed data and how this data will be used to improve high quality instruction Formulation of consisted data definitions, standards and management processes 	<ul style="list-style-type: none"> Development of data requirements as determined by the District-wide personalized learning strategic plan

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Initiative 17 — Digital Classroom Technology

Project Description

This initiative seeks to upgrade all other technology equipment, apart from computing devices, that are required in a digital classroom. This includes equipment such as smart boards, projectors, audio visual equipment, specialized media development computing devices, etc. In this context, the digital classroom is defined as a classroom that is designed to enhance the quality of instruction using effective technology tools and providing access to the tools needed to develop student technology skills

Business Benefits/Rationale	Estimated Time Frame and Estimated Cost											
	▼ START								▼ END			
	2014				2015				2016			
<ul style="list-style-type: none"> Provides access to technology enhanced equipment that enhances the quality of instruction at the District Provides access to technology tools needed to develop specialized skills for digital audio visual development 	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4
	Estimated Cost: \$25–\$35 million over 5 years											

Activities

- Develop digital classroom technology equipment plan that:
 - Determines standard equipment requirements based on student needs and grade levels
 - Establishes criteria for determining deployment priorities (i.e., which schools or grades to deploy equipment in priority order)
 - Determine deployment and refresh schedules
- Establish ongoing initiative budget and funding streams
- Review current equipment vendor pricing, contacts and licenses
- Begin systematic installation of digital classroom technology

Critical Success Factors/Key Performance Indicators	Dependencies
<ul style="list-style-type: none"> Understanding of true cost for purchase and ongoing maintenance of equipment Consistent multiyear equipment refresh funding stream Buy-in from school principals and teachers on deployment priorities and support requirements 	<ul style="list-style-type: none"> Establishment of District-wide support and maintenance structure for equipment environment Development of District-wide personalized learning strategic plan

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Initiative 18 — Technology Educational Specifications

Project Description

This project will define baseline specifications and guidance for managing education technology . It will provide guidance for school principals by offering a menu of options that will enable them to make their own decisions about the following: computing devices, technology funding practices, instructional application options, etc. It will also define available District capabilities for technology support/vendor management and provide a catalog of available technology tools and services. It will also provide guidance on student management policy issues like cyber bullying, etc.

Business Benefits/Rationale

- Offers a menu of choices regarding standards that ensures all schools can build and maintain a baseline standard of technology capabilities while still enabling them to make their own decisions
- Offers guidance and education on technology management issues

Estimated Time Frame and Estimated Cost

▼ START ▼ END

2014				2015				2016			
Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4

Estimated Cost: Staff time

Activities

- Setup working group comprising of stakeholder representatives to research and develop baseline standards
- Review and approve baseline standards, menu of options and guidance materials
- Communicate with and educate school leadership
- Devise mechanism to evaluate baseline technology deployment at schools

Critical Success Factors/Key Performance Indicators

- Buy-in of baseline standards and options by school leadership
- Well defined funding mechanisms to enable schools to meet these minimal standards

Dependencies

- Availability of internal I&T staff to devote time to work on this initiative



Initiative 19 — Coordinated Vendor License and Contract Management Program

Project Description

This project aims to reduce redundancies and enable better Instructional Application Licensing and Contract Management across all Broward County Public Schools

Business Benefits/Rationale	Estimated Time Frame and Estimated Cost											
<ul style="list-style-type: none"> Lowens licensing, training, and potentially system administration costs 	▼ START				▼ END							
	2014				2015				2016			
	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4
Estimated Cost: None (results in monetary savings to BCPS)												

Activities

- Conduct District-wide inventory of all existing software licenses and I&T vendors
- Consolidate a list of software packages and licenses that can be used to fill the academic needs
- Negotiate vendor discounts
- Leverage economies of scale and joint purchasing
- Inform and coach school leaders on available district-wide contracts

Critical Success Factors/Key Performance Indicators	Dependencies
<ul style="list-style-type: none"> Documentation of Licensing cost savings of when compared to a prior reporting period Successful negotiation of discounts with vendors 	<ul style="list-style-type: none"> None



Initiative 20 — Business Application Rationalization Initiative

Project Description

This project aims to create a road map for a reduction/elimination of high cost/risk of an unresponsive collection of applications. This can include cleanup, overhaul, replacement, retirement, modernization or consolidation of applications.

Business Benefits/Rationale	Estimated Time Frame and Estimated Cost											
	▼ START ▼ END											
	2014				2015				2016			
<ul style="list-style-type: none"> Reduces application maintenance costs by eliminating or replacing redundant applications Improves responsiveness by eliminating layers of changes to legacy applications Aligns application portfolio to District objectives 	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4
	Estimated Cost: \$250K–\$300K											

Activities

- Develop strategy:** Define the target direction and business imperatives for the portfolio based on the District strategy. Efficiently assess the portfolio with respect to business contribution, technical condition, operational cost, and architecture characteristics. Provide an actionable, prioritized and time-sequenced strategy to achieve the portfolio strategy and ensure a common understanding of project results to all stakeholders
- Design solution:** Synthesize objectives for modernization based on enterprise context, technology requirements, and guiding principles. Define an agreed-upon direction of the applications and infrastructure and analyze “just enough” current state to understand gaps between the target and costs for the road map. Structure the optimal approach to incrementally migrate from current to target and understand rough order magnitude capital costs

Critical Success Factors/Key Performance Indicators	Dependencies
<ul style="list-style-type: none"> Buy-in from all stakeholders Repeatable discipline established to continually manage and optimize the application portfolio for greater performance Application portfolio responsive to market trends and changes (i.e., social networking, mobile accessibility, cloud computing, big data) 	<ul style="list-style-type: none"> None

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Initiative 21 — District Shared Services Identification

Project Description

Shared services as a delivery model in which a shared-service center, supported by dedicated people, processes and technologies, acts as a consolidated provider of a defined services for use by multiple departments. This project would seek to identify services that today are manually duplicated across the District (e.g., accounts receivable, printing services) and determine the potential to execute the services in a more effective manner

Business Benefits/Rationale	Estimated Time Frame and Estimated Cost											
<ul style="list-style-type: none"> Reduces the cost of identified services through standardized systems and automated processes provided by a single entity rather than duplicated services provided by multiple entities Increases the efficiency and quality of services through focused planning, vendor management and dedicated resources 	▼ START				▼ END							
	2014				2015				2016			
	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr3	Qtr 4	Qtr 1	Qtr 2	Qtr3	Qtr 4
Estimated Cost: \$ 3–\$5 million over 5 years												

Activities

- Identify potential services (e.g., accounts receivable processing at BCPS) and build business case for sharing a service
- Determine which services should be deployed; in what order?
- Determine sharing model (How many centers? Will they be virtual or physical? Will the services be optional or mandatory?)
- Determine sourcing vehicle (Who delivers? Internally or externally)
- How will services be funded (How much? Should chargeback be used? If so, what chargeback mechanism?)
- Determine governance (Who decides? How will sponsorship and governance work?)
- Build change management plan (How to change? Designing the change program)

Critical Success Factors/Key Performance Indicators	Dependencies
<ul style="list-style-type: none"> Leadership engagement Clear scope of what services will be shared Well developed capabilities and skills (includes project management) for managing shared services Draft Services and Organizational Plan 	<ul style="list-style-type: none"> None

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Initiative 22 — Mainframe Phase-Out

Project Description

The goal of this initiative is to migrate district systems off the current mainframe platforms. This would be a multiphase program to 1) move the SAP system off the current DB2 on z/OS platform, and 2) move business applications off the IBM VSE environment

Business Benefits/Rationale

- Mitigate effect of loss of personnel with the scarce skills needed to maintain legacy mainframe environments
- Exploit the cost effectiveness, efficiency, scalability, reliability, and skill availability of newer platforms

Estimated Time Frame and Estimated Cost

START				END							
2014				2015				2016			
Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4

Estimated Cost: The cost of this initiative is included in the Core Infrastructure Upgrade initiative (Initiative 5)

Activities

- Validate future application and database infrastructure
- Define management services and tools
- Assess all aspects of licensing and support that will influence costs of new platform
- Define plan for x86 virtualization for consolidation, high availability and clustering
- Define plan for data migration
- Update disaster recovery plan
- Procure and install new equipment

Critical Success Factors/Key Performance Indicators

- Well documented multi-phase migration plan
- Clear documentation and underlying data structures and the quality of data.
- Clear definition of potential cost savings and risk mitigation

Dependencies

- Understanding of the requirements for future business applications that will be hosted on the new environment



Initiative 23 — Single Sign-On (SSO) & Unified Portal

Project Description

The project will develop a strategy and implement a technology solution that enables users to access various systems and software resources by signing-on once based on a user's access permissions, it also provides a single integration point for accessing these systems

Business Benefits/Rationale	Estimated Time Frame and Estimated Cost											
<ul style="list-style-type: none"> A well-executed SSO strategy reduces password-related support incidents and provides users with improved convenience and more efficient authentication processes Reduces user frustration of having to log in multiple times, having to remember multiple passwords to access multiple applications and navigate through multiple screens and windows 	▼ START				END ▼							
	2015*				2016				2017			
	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4
	Estimated Cost: \$ 4 – \$ 7 million (Note: timescale starts in 2015)											

Activities

- Assess the Current Environment and Pain Points:** The first step is to scope the problem space by identifying the user population and use cases that require a solution, and to inventory the target systems, their architectures and anticipated lifetimes
- Evaluate anticipated changes to in-scope applications:** Determine which applications used today still be in scope in one year, two years or three years (e.g., current SIS, asset management system) ? If an application will be retired, replaced or have its user base significantly reduced within one to two years, then it may be removed from consideration
- Assess currently owned services or solutions that can be leveraged to reduce the in-scope applications:** Determine what tools BCPS currently owns that could help reduce the problem space? BCPS may possess an infrastructure, such as Active Directory, a password management/synchronization tool or a Web access management (WAM) tool that could be better leveraged
- Select and deploy solutions to resolve the remaining requirements:** Many tools are available in the market and close evaluation is needed to select that one that best meets BCPS's needs

Critical Success Factors/Key Performance Indicators	Dependencies
<ul style="list-style-type: none"> Ensure proper steps are taken to identify applications and users that need extra security and need additional authentication steps Selection of the most appropriate Identity Management Systems that will enable access to BCPS's multiple platforms 	<ul style="list-style-type: none"> Clear understanding of SIS, DLP and SAP application strategy as these are key systems that would need convenient access but contain sensitive data



Initiative 24 — Legacy Business Application Migration

Project Description

The project will modernize legacy business applications that need to be migrated off the mainframes (does not include SAP). This will be based on the plan that is an outcome of the Business Application Rationalization initiative.

Business Benefits/Rationale	Estimated Time Frame and Estimated Cost																																																					
<ul style="list-style-type: none"> ■ Begin to implement cost efficient modern applications which better meet the district's needs ■ Eliminates process redundancies and duplications ■ Remove risk of losing the skills to maintain the legacy applications 	<table border="1"> <tr> <td colspan="12"></td> <td style="text-align: center;">START</td> <td style="text-align: center;">END</td> </tr> <tr> <td colspan="4" style="text-align: center;">2014</td> <td colspan="4" style="text-align: center;">2015</td> <td colspan="4" style="text-align: center;">2016</td> <td colspan="2"></td> </tr> <tr> <td>Qtr 1</td><td>Qtr 2</td><td>Qtr 3</td><td>Qtr 4</td> <td>Qtr 1</td><td>Qtr 2</td><td>Qtr 3</td><td>Qtr 4</td> <td style="background-color: red;">Qtr 1</td><td style="background-color: blue;">Qtr 2</td><td style="background-color: green;">Qtr 3</td><td style="background-color: yellow;">Qtr 4</td> <td colspan="2"></td> </tr> </table> <p>Estimated Cost: \$ 1 –\$ 1.5 million</p>																								START	END	2014				2015				2016						Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4		
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Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4																																											

Activities

- For every application, use the results from the Application Rationalization engagement to baseline understanding of its current use (assessment of business objectives and technical/business benefits; integration with critical applications; review design)
- Define current issues desired and future functionality which should include activities like integration with other applications, individual application capabilities, individual application governance, individual application architectural style, technical requirements. The result would be a functional gap analysis
- Define application business and technical requirements
- Review , procure and implement business applications available on the market

Critical Success Factors/Key Performance Indicators	Dependencies
<ul style="list-style-type: none"> ■ Willingness to review and change business processes that these applications support ■ Well defined business and technical requirements for replacement applications 	<ul style="list-style-type: none"> ■ Completion of the Application Rationalization Initiative



Initiative 25 — School Website Enhancement Program

Project Description

The goal of this project is to supply design options and create mandatory standards for all schools within the District that wishes to develop their own website and standardize the “look and feel” of existing individual school web sites. Standardization may include attributes like graphics, URL standards, approved and unapproved content, etc.

Business Benefits/Rationale	Estimated Time Frame and Estimated Cost											
<ul style="list-style-type: none"> Offers consistency of user experience which subsequently improves communication with website users Offers legal protection to the District by ensuring that only approved content is placed on school websites Provides flexibility to individual schools by allowing them to tailor their web sites to their needs 	START				END							
	2014				2015				2016			
	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4
Estimated Cost: \$100K–\$200K												

Activities

- Develop design options, standards, and verbiage
- Validate options, standards, and verbiage with the chosen internal BCPS stakeholders
- Launch initiative

Critical Success Factors/Key Performance Indicators	Dependencies
<ul style="list-style-type: none"> BCPS receives positive (solicited or unsolicited) feedback from stakeholders and users about web site navigation experience 	<ul style="list-style-type: none"> None

Key Assessment Findings



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Key Assessment Findings: User Access to Technology



- 1. Strategic Movement Toward Personalized Learning:** There is a clear movement at the District to build personalized learning capabilities, beginning with the Digital 5 and other similar initiatives. This is a clear indication that the District's technology infrastructure will need to support this strategy as it expands.
- 2. Outdated Computing Environment at Schools:** All school stakeholders reported a large inventory of outdated computers and software that has not been refreshed since the latest investments were made anywhere between 5–7 years ago. This equipment is not meeting current needs and users have expressed an urgent need for replacements. Stakeholders voiced the need to institutionalize a priority-driven I&T refresh plan.
- 3. Users Reported Stable but Increasingly Slower Wireless Infrastructure at Schools:** Wireless infrastructure has been established in all but 17 schools; however, users report that increased use has slowed down the network performance.
- 4. Concerns about Student Internet Connectivity Away from School:** A greater reliance on the Internet to deliver and receive assignments has raised concerns about the students' ability to access the Internet outside the school environment. While the District should not be responsible for offering Internet access outside the school, academic stakeholders are concerned about being able to track the students' ability to access the Web at home.

Key Assessment Findings: User Access to Technology



5. **Concern About Access to Technology for Special Needs Students:** Stakeholders have indicated that the strategic plan needs to address technology needs of students with special needs (e.g., students with disabilities, ESOL students, etc.)
6. **Need for Technology Training as an Integrated & Continuous Part of Teacher and Staff Professional Development (PD):** Stakeholders have expressed that any future teacher and staff PD must include technology as an integrated part of classroom instruction. This include computer basics and strategies for how technology can be effectively used in the classroom.
7. **Need for Increased Teacher Collaboration:** The stakeholders voiced a strong need to institute a formal online collaboration environment in which teaching best practices, lesson plans, etc. can be shared (beyond what is currently available through BEEP).
8. **Lack of a Single Entry Point for Users to Application and Technology Resources:** Users reported that it is very cumbersome to access multiple applications and record many different usernames and passwords. There is an opportunity to use an intranet site as a sole entry point to all applications.
9. **Some Interest in Bring-Your-Own-Device (BYOD) Programs:** There is some interest in piloting additional BYOD programs across all District schools; however, stakeholders expressed that such a program also needs to address any equality and access issues that will likely surface.



Key Assessment Findings: School Technology Management & Support

- 1. Need for Strategic Guidance on Technology Investment at Schools:** Though schools technology budgets, there have been inconsistent investments in technology across the District. Some principals have stated that outside of an overall lack of funding, this is due to a lack of guidance on how to make technology choices and unclear District-wide expectations for the upkeep of technology.
 - 2. Need for Guidance with Implementing Technology Use Policy:** With rapidly changing end user technology, principals and educational stakeholders have expressed a need for clearer guidance about how to implement policy and acceptable use of technology (e.g., issues of cyber-bullying, preventing loss of computers that are taken home, etc.) Especially for issues that spill over from home.
 - 3. Inconsistent I&T Support levels at the School Level:** Three levels of I&T-related support have been articulated for schools: (1) general assistance with technology use; (2) curriculum development; (3) media specialists. At present, these roles are not well defined or are combined (e.g., micro techs) who may lack the necessary training and skills to perform these roles effectively.
 - 4. Inconsistent District-Wide Asset Inventory Management:** There is no systematic approach to tracking and reporting I&T assets and inventory (and other inventory in general) as well as tracking support and maintenance requirements. The current asset management system (CSCS) does not offer real time asset tracking and dashboard/console management
 - 5. Need for More Coordinated Education Software Management:** Current licensing and contract management of education software used at schools is not consistent, potential for cost savings and better vendor management as a result of a more coordinated approach across the District.
-

Key Assessment Findings: External Relationships



- 1. Communicating Objectives to the Wider Broward County Community:** BCPS I&T needs to find a method to clearly communicate the I&T Strategic Plan's objectives to the wider Broward County community and, especially, include parents in technology decision making and have a mechanism for receiving feedback.
- 2. Unclear Obligations for I&T Support to Charter Schools:** Some services are provided to charter schools (e.g., state reporting) and I&T has had to take over assets for defunct charter schools. There are opportunities to provide revenue generating services to charter schools.

Key Assessment Findings: Organization and Governance



- 1. Shift from Self-Directed Teams to CIO Leadership Seen as Positive:** For a number of years, each I&T team within the I&T organization was self-directed, interviewees expressed that while self directed teams may have worked before, current disruptive changes in technology require focused technology leadership championing the role of technology in education transformation within the District.
- 2. I&T Organizational Structure Not Fully Aligned to Meet Academic and Business Needs:** Current I&T organizational structure is operating in functional silos. Opportunity exists to examine the current model to ensure that it aligns to better serve the needs of I&T customers and incorporates current I&T organizational best practices.
- 3. Inconsistent I&T Decision Making Governance Process:** Technology decision-making is distributed within several levels at the school District (schools, departments and I&T). This has resulted in inconsistent technology decision making. Governance should define the role and use of advisory committees and other internal District committees involving technology
- 4. Technical/Adult Education Schools Making Independent Technology Choices:** BCPS's technical and adult education schools have begun making independent technology choices (SIS and Digital Learning Platform [DLP] Selection) as they perceive that I&T has not been proactive in modernizing its system environment and meeting their needs.

Key Assessment Findings: Applications



- 1. Well Established SAP Application, Opportunity to Leverage More Functionality:** When SAP was implemented, a number of different modules were purchased. Currently, not all of them are being used; some of these could provide much needed functionality. There is consensus that adequate training should be received on using these modules once they are turned on. Additionally, some existing applications, such as service desk software, could be integrated with SAP.
- 2. TERMS — SIS Stable but Inflexible Due to Aging Architecture:** While TERMS has been reliably serving the needs of BCPS, it does not currently provide the functionality available in more modern SISs. It is maintained in-house and its underlying aging architecture prevents quick functionality upgrades and poses a skill risk as over the next five years as support staff may retire.
- 3. Reliable but Aging and Disparate Application Portfolio:** Users expressed that they are overburdened with the number of applications they have to access in order to generate reports, perform queries, etc. Opportunity exists to rationalize the current portfolio with the intent of simplifying and reducing the number of technology and business applications currently in use and obtaining buy-in for each application that will be retained.
- 4. In-House Developed and Maintained Application Environment:** This has limited the ability to exploit the functionality of modern Commercial Off-The-Shelf (COTS) applications. Opportunity exists to source applications externally (including the cloud).