6 Administrative and Instructional Technology

Miami-Dade County Public School's Administrative and Instructional Technology Departments have performed admirably within the framework of their operating organizations. However, a comprehensive District-wide strategic technology plan has not been developed for the School Board's approval.

Conclusion

The two organizational units that are responsible for Administrative and Instructional Technology in the District – the Office of Information Technology (OIT) and the Division of Instructional and Media Support Services (Instructional Technology) – are each doing a commendable job of delivering a myriad of products and services to the District. The Office of Information Technology has been proactive in tailoring its services and products to stay abreast of District requirements and, when possible, achieve savings. Among other accomplishments, OIT has established a comprehensive training program for school-based technicians, decentralized network support, established a schedule of weekly visits to schools to track progress on projects, and aggressively participated in the E-rate program to facilitate the District's expansion of its computer network. Likewise, the Division of Instructional Technology and Media Support Services has provided leadership in developing and implementing integration strategies for both schools and District curriculum units and has articulated a vision for how technology can transform teaching and learning in the Miami-Dade County Public Schools. The Division offers a broad range of staff development opportunities, which are tailored to school needs. In addition, the Division has been proactive in acquiring District licenses for digital contents and resources; has aggressively sought funds to replace obsolete classroom computers and enhance classroom infrastructure; and is leading the move to distance learning by acquiring distance learning software, workshops, consultant services, and technical support. In short, both OIT and Instructional Technology make a positive contribution to the District's goal of providing a quality education for students.

During the course of this review, Berkshire Advisors identified a number of District accomplishments in the areas of Administrative and Instructional Technology, some of which are included in Exhibit 6- 1 below.

Exhibit 6-1

The District Has Had a Number of Notable Accomplishments in Administrative and Instructional Technology in the Last Three Years

- Instructional Technology developed an Instructional Internet portal, Virtual Campus, for teachers, which includes an instructional management tool based on state standards, an assessment tool, software for grades 4-10 in mathematics and science, online databases for research and lesson planning, and communication tools.

- Instructional Technology brought to the District a number of quality information technology programs (e.g.,

CISCO in 22 senior high schools, Oracle in eight senior high schools, and Apple Web academies in 12 senior high schools [1]) and managed, trained, and supported teachers and students using these programs.

- Instructional Technology has striven to bring innovative yet practical technology applications to the classroom by, for example, piloting the use of handheld devices in two classrooms and developing plans to pilot the use of electronic textbooks using laptop computers and handheld devices.

- The Office of Information Technology has worked to foster a philosophy of "Client First" with the customers it serves. This is exhibited by the department's proactive approach in engaging users and user departments at a number of levels. This includes participation of Senior OIT staff at principal meetings, solicitation of site participation in OIT projects early in a projects lifecycle and at least annual meetings with departments to coordinate developments for the upcoming year.

- OIT has implemented a network infrastructure that facilitates the District's efforts to provide essential information and services to students, teachers, principals, and parents.

- OIT provides free email for all employees, website hosting for schools, free email to students (through a partnership with aol@school), online forms, online technical support and extensive parent resources.

- A web applications group was formed in February 2000 to develop applications that can be hosted on the network thereby "moving data closer to the client."

- Through the efforts of the web applications group OIT has developed an online Procurement Bid and Quote system.

Source: Miami-Dade County Public Schools

Overview of Chapter Findings

Berkshire Advisors reviewed the District's Administrative and Instructional Technology organizations using the Best Practices adopted by the Commissioner of Education. The Berkshire Advisor's consulting team employed several methodologies to develop chapter conclusions and action plans. For instance, Berkshire Advisors conducted on-site interviews with department managers and gathered information on the organizational structure and departmental policies and procedures. In addition, visits were made to over 30 schools where interviews were conducted with administrators, teachers, parents, and School Advisory Council members. Moreover, four community forums were held at locations throughout the District where community members could "drop in" to provide input on the District. Likewise, an e-mail address and 800 numbers were established so District stakeholders could provide input in the study process. A survey was administered to a representative sample of employees throughout the District. (Approximately 13,000 surveys were sent to employees of which 3,919 were returned.) To receive additional input, Berkshire Advisors surveyed other departments, school districts, relevant local governments and private industry. Questions varied depending on the groups surveyed and the results have been validated and incorporated into this chapter where applicable.

An overview of chapter findings is presented below.

Planning

1. The District has solicited and used stakeholder input in developing an integrated learning system and in setting priorities for technology decisions. However, because there is no single point of responsibility, the Office of Information and Technology (OIT) and the Instructional Technology Division have developed separate departmental plans. (Page 6-10)
2. The District has not developed a comprehensive technology plan that provides for administrative and instructional technology collaborative decision making. Technology plans were developed independently of each other while sharing many of the same objectives. (Page 6-14)

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[1] Cisco, Oracle and Apple academies are programs sponsored by corporations that provide a curriculum and in some cases hardware and software whereby the student taking the course leaves with an understanding of networks and component hardware, programming languages (e.g., HTML, Java) and/or multimedia and web programming.

Effective Support

3. The District provides formal and informal support to assist educators in incorporating technology into the curriculum. However, the assignment of staff is skewed when comparing secondary schools vs. elementary schools. (Page 6-18)
4. The District provides technical support for educational and administrative systems in the District. However, it can leverage its purchasing power and reduce the total cost of ownership by streamlining technical support. (Page 6-20)
5. The District provides technical support for hardware, software, and infrastructure in a timely and cost-effective manner. However, given the proliferation of technology, the District should consider alternative methods of technical support. (Page 6-22)

Professional Development

6. The District has a professional development plan that reflects the District's vision of integrating technology to enhance and enrich the learning environment, as well as to improve administrative support. However, to fully take advantage of the efficiency gains that can be realized by technology, we recommend that the District mandate certificated staff attend scheduled technology training. (Page 6-24)
7. The District provides professional development for the instructional technologies. (Page 6-26)

Appropriate Technologies

8. The District bases technology acquisitions on instructional needs and makes technology acquisitions based on those needs. (Page 6-26)
9. The District bases technology acquisitions on the results of research, planning, and evaluations of previous technology decisions to ensure technology decisions are cost-effective. (Page 6-27)
10. The District has established standards for acquiring new programs and digital content that promote the integration of technology into everyday curricular needs. (Page 6-29)
11. The District has a stable and efficient infrastructure; however, as part of the District-wide technology planning process, the District should assess future infrastructure needs and develop cost effective strategies to maximize service delivery (Page 6-31)

Use of Technologies

12. The District has established and communicated a policy stating appropriate uses of all types of technology resources, including computers, video equipment, software, and the Internet. (Page 6-36)
13. The District supports compliance with the established policy on safe and legal use of technology resources. (Page 6-37)

Business Systems

14. Segregation of Duties: While the District generally segregates duties to reduce the risk that unauthorized transactions will be entered and not discovered quickly, the current assignment of the OIT function to the Chief Financial Officer is inappropriate. (Page 6-38)
15. User Controls: The District's user controls ensure authorization prior to processing transactions and ensure all output represents authorized and valid transactions. (Page 6-39)
16. Application Controls: The District's applications are designed to provide users with reliable data. (Page 6-40)
17. The District has established general controls in the areas of access, systems development and maintenance, documentation, operations, and physical security to promote the proper functioning of the information systems department. (Page 6-40)
18. The District's management information systems provide data needed by administrative and instructional personnel in a reliable and timely manner. (Page 6-41)
19. The District should take steps to minimize the number of databases that are independent of its centralized computer systems.   (Page 6-41)

20. The District has established appropriate controls related to electronic data exchange transactions processed through electronic media and image processing systems. (Page 6-42)

Fiscal Impact of Recommendations

Some of the recommendations in this chapter have a direct fiscal impact while others can be accomplished with existing resources. In summary, we believe that in developing a comprehensive District-wide strategic technology plan the District can identify areas of significant savings. The recommendations with fiscal impact are listed in Exhibit 6-2.

Exhibit 6-2

Recommendation	Five Year Fiscal Impact
• Action Plan 6-2: Develop a District-wide Strategic Technology Plan to be adopted by the Miami-Dade County Public Schools Board of Education. [2]	• We recommend that a qualified 3rd party vendor be hired to assist the District in developing a District-wide Strategic Technology Plan. We estimate that the one-time cost to the District for a 3rd party vendor to assist in developing the Strategic Technology Plan is $1.3 million. In developing the plan, we believe the District can identify areas of significant savings. We estimate that depending on the approach taken by the District, at least $29 million of savings over a five-year period can be identified. [3]
• Action Plan 6-12: Conduct a network performance baseline assessment on the backbone and all WAN links every two to three years.	• We estimate the one-time cost to the District to be no more than $150,000.
• Action Plan 6-13: Implement a firewall strategy with an isolated demilitarized zone (DMZ) segment to make hacking into host servers that reside in a DMZ strategy more difficult.	• The District estimates the one-time cost for this recommendation to be no more than $75,000.

Source: Berkshire Advisors, Inc.

Background

This section is divided into three subsections. The first subsection provides a brief summary of the services provided by the two units that are responsible for the District's Administrative and Instructional Technology functions. The second subsection discusses the organizational structure of each unit. The final subsection presents

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[2] As part of this recommendation the District also should implement Action Plans 6-4, 6-5, 6-6, 6-8 and 6-10.
[3] Currently, there are 25 qualified pre-approved vendors that provide desktop computers to the District. The $27.7 million in savings is largely due to the District substantially reducing the overall number of hardware vendors, and have a few vendors responsible for acquiring, setting up and installing desktops and peripherals, and being responsible for technical support on these desktops (i.e., a seat management strategy). This strategy would enable the District to reduce technical support staff positions; that is, the District can realize economies of scale by changing its acquisition, maintenance, and technical support methods.

the results of selected benchmark comparisons of the District's Administrative and Instructional function with those of other large school districts.

Functions And Services

Two units – the Office of Information Technology (OIT) and the Division of Instructional Technology and Media Support Services (Instructional Technology) – share responsibility for the District's Administrative and Instructional Technology functions. A brief discussion of the functions and services performed by each of these units follows.

Exhibit 6-3

Administrative and Instructional Technology Reporting Relationships
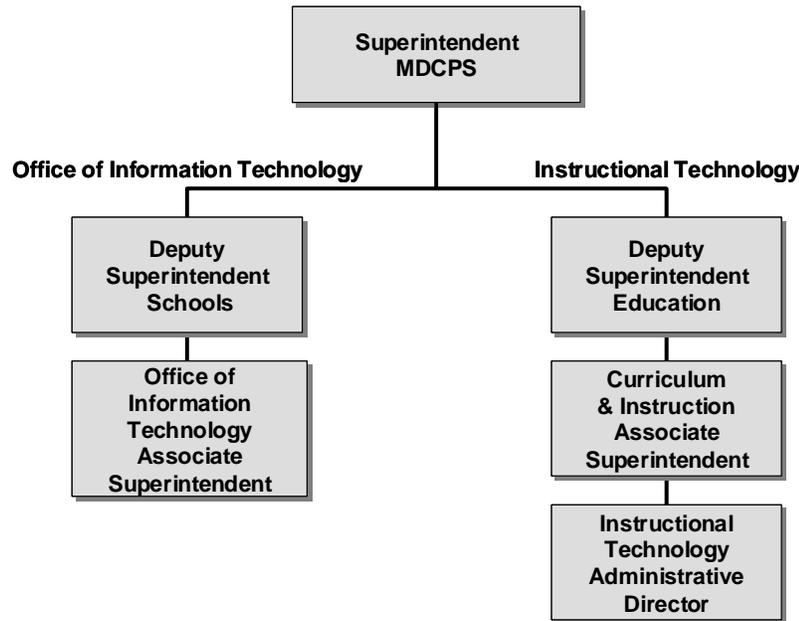
Source: Miami-Dade County Public Schools.

Office of Information Technology. OIT provides services and information to the many users of the systems it supports while also maintaining legacy systems, some of which were purchased and installed more than 20 years past. In addition, OIT provides training for more than 134 school-based technicians, provides decentralized network support, manages projects and coordinates the District's participation in the E-rate program. [4] OIT has also developed and implemented an Internet Portal that provides teachers access to a myriad of helpful information to use in their teaching responsibilities. Moreover, by establishing various academies (e.g., Oracle, Cisco and Apple Web) OIT supports the efforts of students to build upon the knowledge and skills gained in the classroom

Instructional Technology. Instructional Technology provides leadership in developing technology integration strategies for both schools and District curriculum departments and has articulated a vision for how technology can transform teaching and learning. The Division offers a broad range of staff development opportunities, which are tailored to meet the needs of individual schools. In addition, a "train the trainer" model has been instituted to ensure that all schools have staff on site who are able to provide support in integrating technology and instruction. The Division has also been proactive in acquiring District licenses for digital content and resources. It has also aggressively sought funds to replace obsolete classroom computers and enhance classroom infrastructure. (Over

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[4] E-rate is a Federal program that provides funds to school districts for connecting students to the Information Highway.

$23 million in bond and capital funding has been obtained for this purpose since July 2000.) The Division is also leading the move to providing online staff development and is supporting curriculum departments in their efforts to expand distance learning by acquiring distance learning software, holding workshops, providing consultant services and providing technical support.

Organization

At the time Berkshire Advisors, Inc. conducted its onsite visits (August through October 2000) the Associate Superintendent who leads the Office of Information Technology reported to the Deputy Superintendent of Schools. Since that time the Deputy Superintendent of Schools has retired and the Associate Superintendent now reports to the Chief Financial Officer. The Director of Instructional Technology, on the other hand, is assigned to the Education unit. She reports directly to the Associate Superintendent for Curriculum and Instruction who, in turn, reports to the Deputy Superintendent Education.

Exhibit 6-4

Division of Instructional Technology and Media Support Services
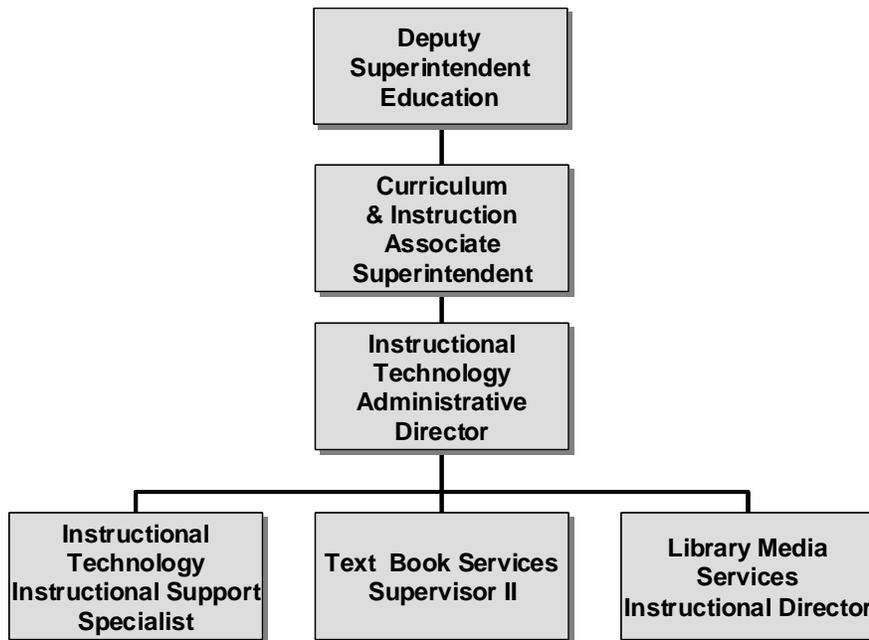
Source: Miami-Dade County Public Schools

Division of Instructional Technology and Media Support Services. The Administrative Director who leads the Division of Instructional Technology and Media Support Services oversees three units – Instructional Technology, Textbook Services, and Library Media Services. The Instructional Technology unit oversees the integration of technology into the curriculum. The Textbook Services unit is responsible for ordering and distributing textbooks to the schools. Finally, the Library Media Services unit – which is led by an Instructional Support Supervisor – has primary responsibility for providing an array of services to its users.
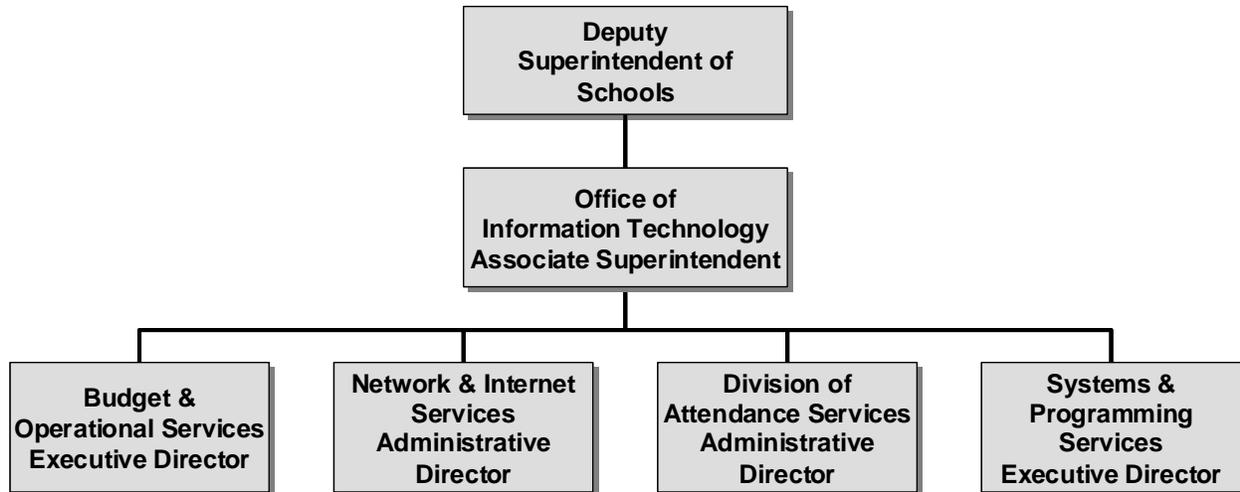
These services include:

- Providing professional resources in a variety of formats;
- Offering professional growth opportunities;
- Networking with community connections offering diverse resources; and

- Providing leadership in evaluating and improving school library media programs.

Exhibit 6-5

Office of Information Technology

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                        ┌─────────────────────┐
                        │      Deputy         │
                        │  Superintendent of  │
                        │      Schools        │
                        └─────────────────────┘
                                   │
                        ┌─────────────────────┐
                        │     Office of       │
                        │Information Technology│
                        │Associate Superintendent│
                        └─────────────────────┘
                                   │
        ┌──────────────┬───────────┴───────────┬──────────────┐
┌──────────────┐ ┌──────────────┐ ┌──────────────┐ ┌──────────────┐
│  Budget &    │ │Network & Internet│ │ Division of │ │  Systems &   │
│Operational Services│ │  Services   │ │Attendance Services│ │ Programming │
│Executive Director│ │Administrative│ │Administrative│ │  Services   │
│              │ │  Director    │ │  Director   │ │Executive Director│
└──────────────┘ └──────────────┘ └──────────────┘ └──────────────┘
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Source: Miami-Dade County Public Schools.

Office of Information Technology. The Associate Superintendent who leads the Office of Information Technology oversees four units – Budget and Operational Services, Network and Internet Services, Attendance Services, and System and Programming Services. The Budget and Operational Services is responsible for management and operation of the District's computer systems. This includes long-term planning and responsibility for developing the department's budget. The Network and Internet Services unit provides technical guidance and support to schools and administrative offices. This guidance and support includes the areas of Local Area Networks, connecting to the District's Wide Area Network and developing web sites. The Division of Attendance Services' responsibilities include posting student attendance information, truancy referrals and student transfers. The System and Programming Services' responsibilities include supporting legacy systems.

Benchmark Comparisons [5]

Comparisons of the staffing and costs of technology operations in the Miami-Dade County Public Schools (MDCPS) technology departments with the staffing and costs of technology operations in other large Districts suggest that the quality technology services the District receives are being provided at a very reasonable cost.   For the purpose of this analysis MDCPS staffing and costs were compared with staffing and cost in five large Districts[6] (Palm Beach County, Hillsborough County, Dallas Independent School District, Houston Independent School District, and Clark County [Nevada]) ranging in size from approximately 154,000 students served (Palm Beach County) to approximately 245,000 students (Clark County). [7] The average number of students served by these Districts is approximately 219,000 students. By comparison, the MDCPS serves approximately 360,000 students. (A summary of these benchmark comparisons is presented in Exhibit 6-3.)

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[5] Information is the result of an email survey and a fax response. All information is for school year 2000 – 2001 with the exception of Clark County, Nevada, where it is for school year 1999–2000.

[6] The selection of these Districts was suggested by the consultants and approved by both OPPAGA and the District.

[7] While MDCPS is larger than the Districts used for comparison it is closer in size to these Districts than to larger Districts (e.g., Los Angeles, Chicago, and New York).
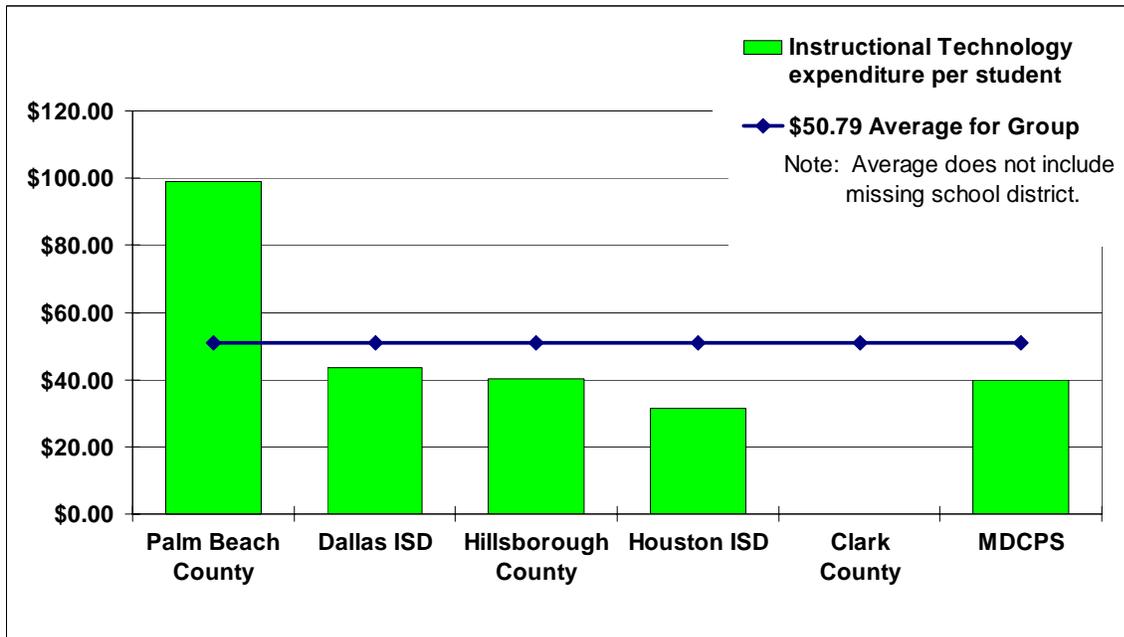
Exhibit 6-6

MDCPS Provides Information Technology Services for Fewer Dollars Than Most Benchmark Districts
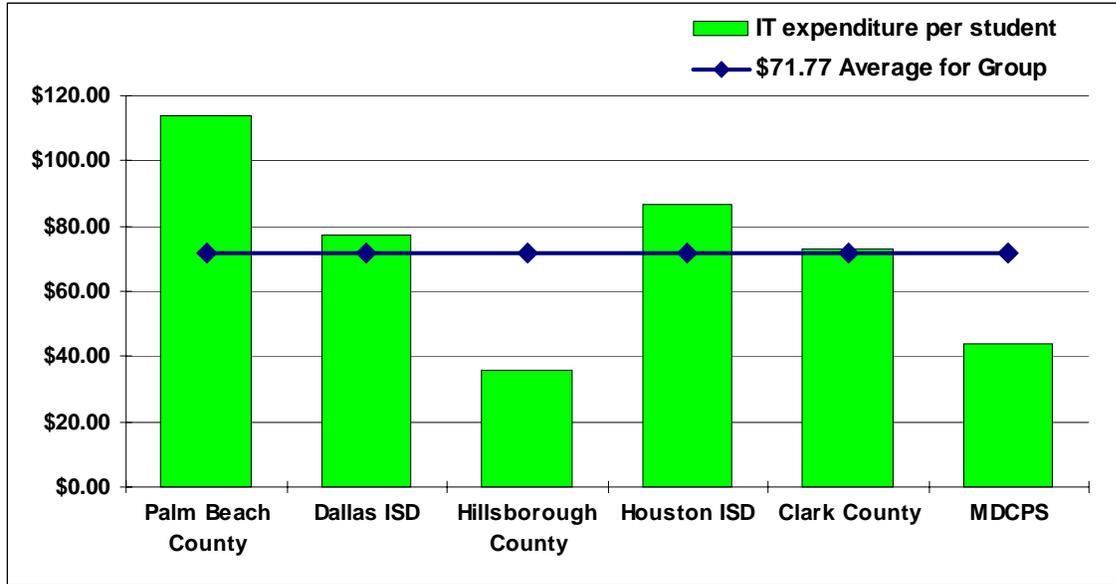
Source: Berkshire Advisors, Inc., based on information from an email survey and a fax response

Exhibit 6-7

MDCPS Instructional Technology Budget Per Student is Comparable to Most Benchmark Districts

Source: Berkshire Advisors, Inc., based on information from an email survey and a fax response.

A key comparison is the ratio of students to information technology (IT) staff[8]. MDCPS serves more students per IT employee than three of the benchmark Districts (Palm Beach County, Dallas, and Houston) but fewer than two of the Districts (Hillsborough County and Clark County). It should be noted, however, that Clark County – like MDCPS – is growing at an extremely rapid pace and consequently its IT staff is in constant "catch up" mode. Benchmark comparisons of IT expenditures for administrative support (i.e., support for business systems such as finance and payroll and the related infrastructure) indicate that MDCPS is providing a comparable level of products and services (in some cases more) for fewer dollars than all but one school district. Indeed, the benchmark comparisons reveal that what MDCPS is doing for $43.65 per student, the benchmark Districts are doing for an average of $77.40 (excluding MDCPS) per student.

Exhibit 6-8[9]

Comparisons With Benchmark Districts Suggest the Costs of Administrative and Instructional Technology Services Provided by MDCPS Are Reasonable

General Information	Palm Beach County	Dallas ISD	Hillsborough County	Houston ISD (*)	Clark County	Miami-Dade School District
Students	154,391	161,593	178,269	208,000	245,600	368,453
Teachers	9,511	10,012	11,451	11,674	13,451	19,181
Non-Teachers	18,127	8,666	9,375	11,491	12,372	17,416

(*) All information is for school year 2000-2001 with the exception of Houston Independent School District 1999 – 2000.

Head Count	Palm Beach County	Dallas ISD	Hillsborough County	Houston ISD (*)	Clark County	Miami-Dade School District
Information Technology	185	150	62	194	120	302
Instructional Technology	10	16	134	38		36

Expenditures	Palm Beach County	Dallas ISD	Hillsborough County	Houston ISD (*)	Clark County	Miami-Dade School District
Information Technology	$17,582,600	$12,495,182	$6,425,709	$17,980,567	$18,000,000	$16,083,453
Instructional Technology	$15,277,000	$7,027,593	$7,172,197	$6,558,524	$0	$14,644,367

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[8] The IT staff included in these ratios provides a full range of information technology services, ranging from payroll support to instructional support.

[9] For comparison purposes, the title of Chief Information Officer is used as the head of information technology. For MDCPS, Associate Superintendent is used to convey the head of information technology.

Salaries	Palm Beach County	Dallas ISD	Hillsborough County	Houston ISD (*)	Clark County	Miami-Dade School District
Chief Information Officer	$110,722	$133,000	$108,582	$116,000	$97,500	$142,992
Director Instructional Technology	$69,846	$77,838	$90,479	$82,000	$78,000	$91,471
Director Networks	$75,540	$87,688	$84,522	$90,000	$78,000	$86,258
Director MIS	$77,488	$88,788	$100,623		$90,000	$107,978
Manager Help Desk	$72,039	$97,873	$82,255	$85,000	$78,000	$77,480
Programmer Analyst	$49,120	$48,856	$51,549	$45,000	$64,000	$34,825
Sr. Systems Analyst	$59,180	$58,732	$70,893	$75,000	$74,000	$67,510
Technician PC	$35,204	$31,886	$32,859	$35,000	$58,000	$33,431
Computer Operator	$25,989	$40,542	$35,843	$33,000	$44,000	$32,265

Source: Berkshire Advisors, Inc., based on information from an email survey and a fax response

Planning

1 **The District has solicited and used stakeholder input in developing an integrated learning system and in setting priorities for technology decisions. However, because there is no single point of responsibility, the Office of Information and Technology (OIT) and the Instructional Technology Division have developed separate departmental plans.**

To ensure the development of a cohesive District-wide strategic technology plan and incorporation of various technology initiatives, the District should consider creating the position of Chief Information Officer for the District

Using computers for self-paced learning, research in the classroom, distance learning, processing payroll, hiring an employee as well as a host of other curriculum, classroom and business purposes have a common denominator – technology. As such, the use of technology becomes one of the critical factors senior administrators must consider when planning its use in today's K-12 arena. Coupling the need for technology and the rapid pace at which technology is evolving makes it all the more important that planning be at a senior level. Thus, planning for the use of technology is equally as important as executing against or implementing a technology project.

At Miami-Dade, planning for the use of technology is accomplished on a departmental or programmatic scale. For example, the District has a number of technology committees that accomplish the task of planning for the acquisition, implementation and use of technology. These include the Information Technology Management

Advisory Panel (ITMAP), the Technology Standards Committee and the Instructional Leadership Committee. ITMAP was formed to provide input into key technology decisions made by the Office of Information Technology. Its members include Information Technology Directors from private industry and government entities.

Another District committee is the Technology Standards Committee. The Committee is comprised of Dr. Dan Tosado, Associate Superintendent OIT; Chris Master, Director, Instructional Technology; George Balsa, Chief Auditor; Henry Fraind, Deputy Superintendent Schools (whom has not been replaced since his retirement); and Rose Barefield-Cox, Chief Procurement Officer. This committee establishes standards for the hardware platforms used in the District.

Each committee is staffed relative to the committee's purpose. However, there are opportunities in some of these committees for input by individuals outside of the current committee members (e.g., Instructional Technology does not have representation on the ITMAP committee, but should; Administrative Technology does not have representation on the Instructional Leadership Committee, but should.) Each of these committees clearly operates within the context of either a departmental activity or program objective.

Need for an adopted District Strategic Technology Plan

As discussed in greater length in finding 2 in the next section, Berkshire Advisors is recommending the Miami-Dade County Public Schools Board of Education develop and adopt a District-wide Strategic Technology Plan. The purpose of the plan is to ensure that all District initiatives and plans emanate from this one strategic document. As with all District thinking, the Strategic Technology Plan should focus its strategic goals on student performance and achievement. However, the adoption of the plan without the requisite management oversight would more than likely lead to the plan not being implemented as envisioned by the Board.

Exhibit 6-9

Strategic Technology Plan
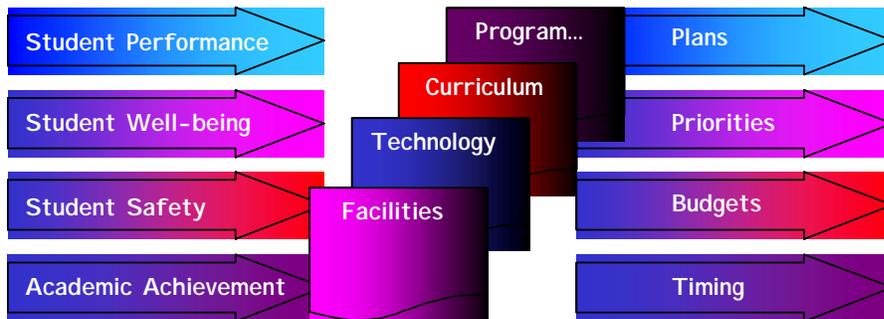
Source: Berkshire Advisors, Inc.

Need for a Chief Information Officer

Although there are a number of methodologies the District could employ to ensure the development and implementation of the Strategic Technology Plan, Berkshire Advisors believes the assignment of this responsibility to a single point of accountability is best.

Technology is evolving at a rapid pace. The World Wide Web and its related technologies have changed the way systems are developed and delivered. The availability of funding (in particular, E-rate) has resulted in the expansion of the District's networks and proliferation of multimedia (e.g., voice, video and data). Departments and individuals are acquiring, using or experimenting with the latest technologies. Conversely, departments and individuals are unaware of technologies that could be of benefit to them and ultimately the District. The challenge to the District at

this time is to select technologies that have the greatest potential for improving the overall effectiveness and efficiency of the District. To achieve these results, the District needs collaboration among all of the stakeholders in setting strategic direction, maintaining a District-wide perspective, and judiciously selecting technologies of the greatest benefit. Facilitating these efforts should be the role of the Office of the Chief Information Officer.

The majority of school superintendents have risen through the ranks of education to reach this most important position - teacher, principal, senior administrator, deputy superintendent, and superintendent. Along the way, most have achieved a level of competence in the areas of curriculum, administration and budgeting (not including the political acumen required to retain one's position). At most if not all stops along the progression, technology was not a required core competency. While it is not critical for the Superintendent of a District to understand the intricacies of the technology being implemented, it is important for the Superintendent to have a broad vision of the available technology and what it can do for the District. Helping the Superintendent to understand and achieve this broad vision is one of the key roles of the Chief Information Officer.

The Chief Information Officer should have a key role in the Superintendent's Cabinet. As strategies are developed at this most senior level of the District, the CIO can provide input on the technology capabilities of the District, as well as align the direction of technology based on the direction of the District.

Exhibit 6-10

Technology Management Hierarchy
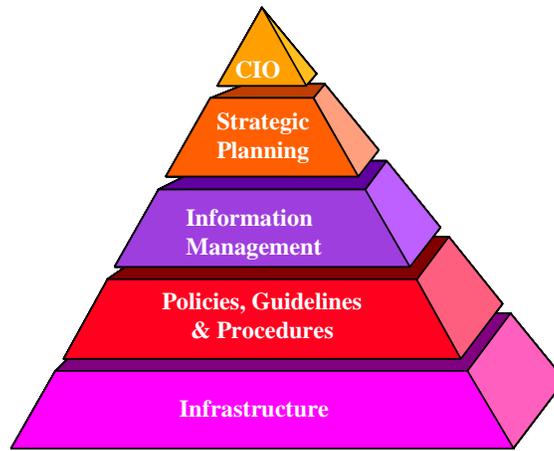
Source: Berkshire Advisors, Inc.

In addition to working closely with the Superintendent and the Cabinet in the role of technology advisor, the Chief Information Officer would be responsible for developing and implementing the District's Strategic Technology Plan; have management responsibility for the District's technology assets; and be responsible for selecting systems that take advantage of the latest technologies and can systematically support the business processes of the District. In essence, the Chief Information Officer must be empowered as the single point of accountability for technology in the District. As such, the CIO would have responsibility for implementing the recommendations of this report.

In lieu of creating the position of Chief Information Officer, the District might consider expanding the responsibilities of the current the position of Associate Superintendent of the Office of Information Technology (OIT) to include those of the Chief Information Officer. If this is the case, the position of Associate Superintendent for OIT would be eliminated.

In developing the organizational structure in which the Chief Information Officer would work in, we recommend that this position not report to an organization for which it has delivery responsibility. As shown in Exhibit 6-11, the position of Chief Information Officer reports to the Chief Financial Officer. In this reporting relationship, there are no check and balance for the processing activity of the Chief Financial Officer.

As shown in Exhibit 6-12, the Chief Information Officer reports directly to the Superintendent of MDCPS. Given the current reliance on technology that the District has and the recognition of its increasing value as a strategic asset, we would suggest that this is the ideal reporting relationship.

Exhibit 6-11

Current Reporting Relationship for the Chief Information Officer

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        Superintendent
           MDCPS
              |
           Deputy
        Superintendent
              |
           Chief
      Financial  Officer
              |
           Chief
     Information Officer
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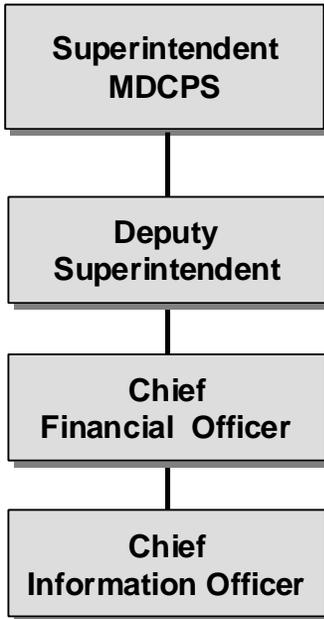
Source: Miami-Dade County Public Schools

Exhibit 6-12

Proposed Reporting Relationship for the Chief Information Officer

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           Superintendent
              MDCPS
           /          \
       Chief          Deputy
   Information      Superintendent
     Officer
```
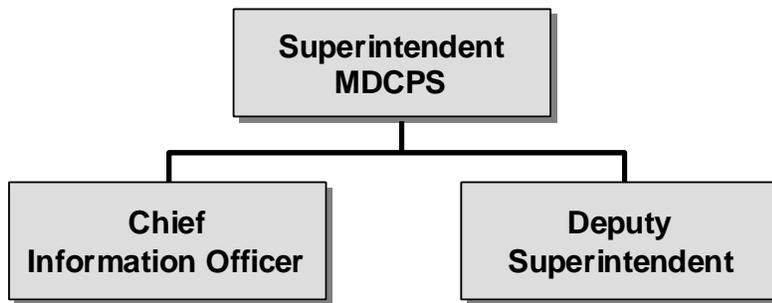
Source: Berkshire Advisors, Inc.

Recommendations ————————————

- *We recommend that the District create the Office of Chief Information Officer to be staffed by the Associate Superintendent for OIT.*

Action Plan 6-1 provides the steps needed to implement this recommendation.

Action Plan 6-1

Create the Office of Chief Information Officer to be staffed by the Associate Superintendent for OIT		
Strategy	The Superintendent creates the Office of the Chief Information Officer and staffs with the current Associate Superintendent for OIT.	
Action Needed	Step 1:	The Superintendent commissions a committee of senior District staff with constituency stakeholder input to develop the job description for the Chief Information Officer.
	Step 2:	The Superintendent with assistance of Human Resources creates the position of Chief Information Officer.
	Step 3:	The Superintendent appoints the Associate Superintendent of OIT to the position of Chief Information Officer.
	Step 4:	The Chief Information Officer begins the process of developing a District-wide Strategic Technology Plan.
Who Is Responsible	Superintendent of Miami-Dade Schools	
Time Frame	May 2002 through October 2002	
Fiscal Impact	This recommendation can be accomplished with existing resources.	

Source: Berkshire Advisors, Inc.

2   The District has not developed a comprehensive technology plan that provides for administrative and instructional technology collaborative decision making. Technology plans were developed independently of each other while sharing many of the same objectives.

To better take advantage of the synergies of Administrative and Instructional Technology, we are recommending that the District develop a District-wide Strategic Technology Plan that is adopted by the Miami-Dade County Public School Board of Education

Administrative Technology (delivered through the Office of Information Technology (OIT)) and Instructional Technology deliver quality, consistent products to the constituents they serve. Both organizations have managed to increase the amount and quality of the delivery of products and services by optimizing the systems they manage and maximizing the resultant purchases through the dollars they spend.

However, Instructional Technology and Administrative Technology function within the framework of disparate organizations. Again, while each is performing admirably within the framework of their own operating organizations, each, in our opinion would better serve the District's needs if they functioned within the same organizational entity, or delivered products and services consistent with a single strategic technology plan.

The Miami-Dade Board of Education expects quality products, best service, consistent delivery and best value from its technology investment. To ensure these expectations are being met, a Strategic Technology Plan must first be developed by the District and adopted by the Board. The plan should chart the strategic direction of the District and provide measurable goals to the organization's delivery of technology services and content.

Berkshire Advisors in reading the District's Strategic Plan 2000 – 2005 cannot find an incidence where Administrative Technology has a strategic deliverable. Yet, a number of the deliverables for the various departments all require significant participation on the part of Administrative Technology. Under the Action Plans, Goal 1, School to Career:

- Objective 1a, Action Step 6 – "Pilot the use of Cognitive Tutor Algebra in three senior high schools. Pilot the use of Cognitive Tutor Geometry in three senior high schools. Pilot the use of River Deep Mathematics in three middle schools."

- Objective 1e, Action Step 1 – "All schools in the District will be retrofitted, connected to the Wide Area Network"…

- Objective 1e, Action Step 2 – "Teachers will have email accounts provided through Miami-Dade County Public Schools."

- Objective 1f, Action Step 8 -- "Acquire up-to-date technology in order to provide distance learning through the Learning Network."

As one can readily see, Administrative Technology's building out of the District's infrastructure seriously impacts each of the objectives mentioned above as well as others detailed in the current District Strategic Plan. Yet, there is no Action Step for a goal of delivering an infrastructure on the part of this organization.

Integral to the success of any District technology initiative is the ability to measure outcomes in the context of the strategic goal. Measuring the results of its technology investment requires that the Miami-Dade County Public Schools Board of Education develop and adopt a strategic technology plan. Embodied in the technology plan are the management and measurement criteria that clearly and simply state the success or failure of a particular technology goal or objective relative to the strategic goals of the District. Berkshire Advisors recommends that a 3rd party vendor be contracted to assist in developing a comprehensive District-wide strategic technology plan. It is our opinion that although District staff should be an integral part of the planning process, they do not have the time or the objectivity to develop a comprehensive, District-wide strategic technology plan.

Exhibit 6-13

Technology Strategic Planning Process
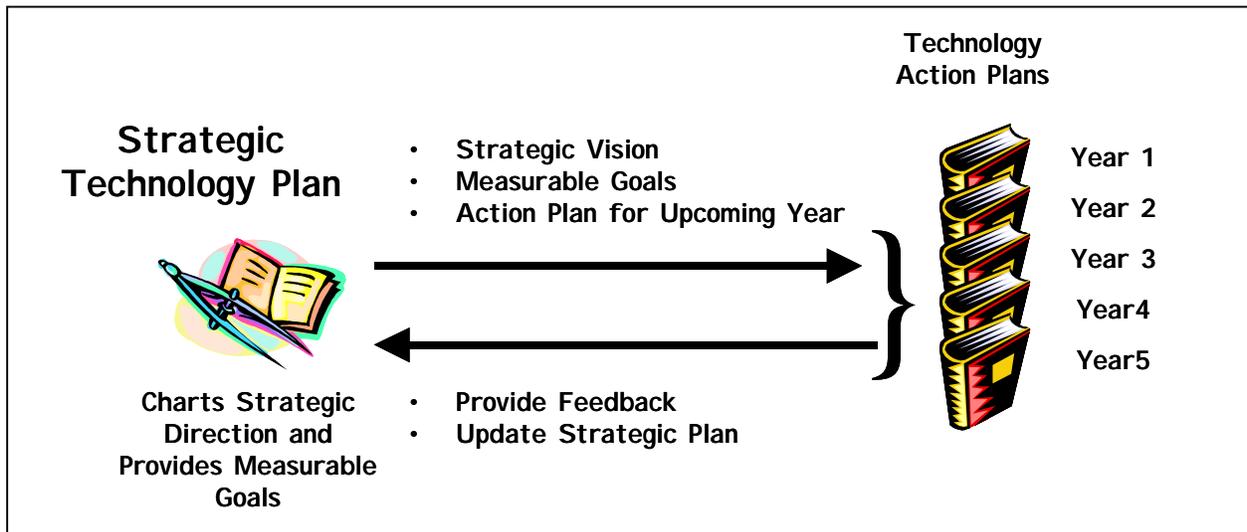
Source: Berkshire Advisors, Inc.

Berkshire Advisors recommends that the District develop a District-wide technology plan. And, that this plan contain within it Board approved annual milestones. Additionally, the Chief Information Officer should develop an

annual Action Plan that details (at a relatively high level) the plan for achieving the milestones and reports on the progress quarterly to the Board of Education.

As mentioned earlier, Administrative Technology and Instructional Technology report to two separate organizations. While not an uncommon reporting relationship among K-12 school districts, this model adds complexity to developing a comprehensive plan with measurable goals. The District should consider aligning Administrative and Instructional Technology within the same organizational umbrella. By aligning the two organizations and by developing a comprehensive District-wide strategic technology plan the District strengthens its ability to manage technology initiatives. Should the Strategic Technology Plan result in not aligning OIT and Instructional Technology under one umbrella, consideration should be given to merging the technical support functions of these two departments under OIT.

Recommendations —————————————————

- *The District should develop a District-wide Strategic Technology Plan to be adopted by the Miami-Dade County Public Schools Board of Education.*

Action Plan 6-2 provides the steps needed to implement this recommendation. As part of this recommendation the District also should implement Action Plans 6-4, 6-5, 6-6, 6-8 and 6-10.

Action Plan 6-2

Develop a District-wide Strategic Technology Plan to be adopted by the Miami-Dade County Public Schools Board of Education	
Strategy	The Superintendent of MDCPS assigns responsibility for developing a District-wide Strategic Technology Plan to the Chief Information Officer.
Action Needed	Step 1: Assign responsibility for developing Plan to the CIO.
	Step 2: The CIO organizes a District Technology Plan Committee of technology stakeholders that include District staff, business and community leaders.
	Step 3: The District Technology Plan Committee develops RFP to be issued for developing the Plan that includes an independent analysis by a 3rd party.
	Step 4: The District Technology Plan Committee presents the proposal to the Technology Steering Committee, which reviews the proposal and makes a recommendation to the Board. Board approves the RFP.
	Step 5: The Technology Steering Committee selects the 3rd party vendor.
	Step 6: Working with the District Technology Plan Committee the vendor develops the District-wide Strategic Technology Plan.
	Step 7: The District-wide Strategic Technology Plan is reviewed by the Technology Steering Committee and presented to the Board for approval. Board approve the plan.
	Step 8: CIO is responsible for implementing the Plan.
	Step 9: CIO updates the Board quarterly on the Plan's progress.
Who is Responsible	Chief Information Officer
Time Frame	May 2002 through May 2003
Fiscal Impact	We recommend that a qualified 3rd party vendor be hired to assist with developing a District-wide Strategic Technology Plan.

We estimate that the one-time cost to the District for a 3rd party vendor to assist in developing the Strategic Technology Plan is $1.3 million. In developing the plan, we believe the District can identify areas of significant savings. We estimate that depending on the approach taken by the District, at least $29 million of savings over a five-year period can be identified. The $29 million in savings is largely due to the District substantially reducing the number of hardware vendors and implementing a seat management strategy, which would enable it to reduce technical support staff positions.

Source: Berkshire Advisors, Inc.

- *The District should perform a cost/benefit analysis of merging the technical support functions of Administrative Support and Instructional Technology Support.*

Action Plan 6-3 provides the steps needed to implement this recommendation.

Action Plan 6-3

The District should perform a cost/benefit analysis of merging the technical support functions of Administrative Support and Instructional Technology Support	
Strategy	The Superintendent of MDCPS assigns responsibility for developing a cost/benefit analysis of merging the technical support organizations for OIT and Instructional Technology to the Chief Information Officer.
Action Needed	Step 1: Assign responsibility for developing analysis to the CIO.
	Step 2: The CIO organizes a committee of technology stakeholders to develop cost/benefit analysis.
	Step 3: Committee of stakeholders reviews current practices and develops alternative technical services delivery methods.
	Step 4: Committee presents alternatives with a recommendation to the CIO.
	Step 5: CIO makes a recommendation to Superintendent of MDCPS.
	Step 6: Superintendent updates the Board on the recommendation.
Who is Responsible	Chief Information Officer
Time Frame	May 2002 through December 2002
Fiscal Impact	This recommendation can be accomplished with existing resources.

Source: Berkshire Advisors, Inc.

Effective Support ――――――――――――――――――

**3** **The District provides formal and informal support to assist educators in incorporating technology into the curriculum. However, the assignment of staff is skewed when comparing secondary schools vs. elementary schools.**

District schools have dedicated technicians responsible for assisting in supporting technology in the classroom

The District is integrating technology at a rapid pace. Teachers and administrators are grasping the technology equally as fast. This is evidenced by the fact that at MDCPS there are approximately 82,000[10] computers in schools. Of these, 63,000 are Personal Computers (PCs) while 19,000 are Apple computers. In the category of PCs approximately 57% or 36,000 PCs are out of warranty and required attention on the part of a District technician when problems arise. This does not include a number of Pentium III PCs that are at the end of their warranty period.

Exhibit 6-14

Computer Types in MDCPS
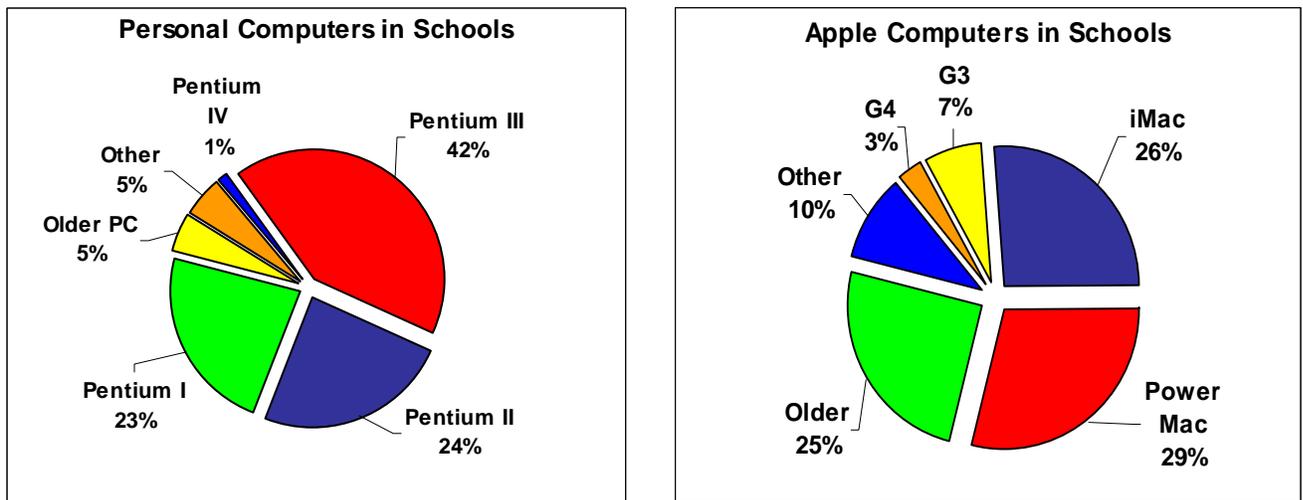
Source: Florida Department of Education *2001 Technology Resources Survey*.

For Apple computers, the numbers look equally as bad. Of the approximately 19,000 Apple computers, 6,500 are out of warranty and require the attention of a District technician when there are problems with the hardware. This number does not include the number of Power Macs that are getting close to reaching the end of the warranty period.

The confluence of the increased usage by teachers (and administrators) and the aging of previously purchased computers is generating the need to ensure that adequate support is available to ensure the highest level of system availability. The most obvious solution is adding additional technical support to the schools. Our preliminary

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[10] Florida Department of Education *2001 Technology Resources Survey*

Berkshire Advisors, Inc.

analysis shows that to staff schools with the appropriate number of technicians it could cost the District anywhere from $4 million [11] to $6.2 million annually or approximately $20 million to $30 million over a 5-year period.

Most schools should have a dedicated technician responsible for maintaining Instructional Technology systems. Currently, there are 154 technicians assigned to support instructional networks in 307[12] schools. All but two secondary schools have a full-time person budgeted and assigned to the individual school, while 205 elementary schools (elementary middle schools included) share the services of 88 staff that rotate from elementary school to elementary school. [13]

Additionally, the Administrative Director for Instructional Technology meets with the region technology specialists on a regular basis to ensure articulation between District instructional goals and school site technology integration.

Recommendations

- *Berkshire Advisors recommends that the District review the criteria for determining the assignment of full-time technical support staff for elementary schools. We believe that the review will indicate that most elementary schools should be staffed with technical support based on the same criteria as that for secondary schools.*

Action Plan 6-4 provides the steps needed to implement this recommendation.

Action Plan 6-4

Review the criteria for determining the assignment of full-time technical support staff for elementary schools		
Strategy	The District should develop a detailed analysis to determine whether adequate technology resources have equitable distribution among all schools.	
Action Needed	Step 1:	Assign responsibility for analysis to the Director for Instructional Technology.
	Step 2:	The Director heads a committee to determine the equitable distribution of technical resources and if and how many additional staff are required.
	Step 3:	The Director makes a recommendation to the Deputy Superintendent.
	Step 4:	The Deputy Superintendent presents the recommendation to the Superintendent and the Board of Education.
	Step 5:	The recommendation is adopted for implementation.
	Step 6:	The Director reports progress on the recommendation implementation.
Who is Responsible	Administrative Director of the Division of Instructional Technology and Media Support Services.	
Time Frame	May 2002 through May 2003	
Fiscal Impact	This recommendation can be accomplished as part of the District-wide technology planning process.	

Source: Berkshire Advisors, Inc.

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[11] Based on information received from the District on February 26, 2002

[12] These do not include special schools such as Charter Schools

[13] Based on information received from the District on February 26, 2002

4 The District provides technical support for educational and administrative systems in the District. However, it can leverage its purchasing power and reduce the total cost of ownership by streamlining technical support.

The District provides quality support for its administrative and educational systems; however it should consider establishing standard hardware platforms that reduce the total cost of ownership by standardizing on one or two vendors

In our opinion, the District provides an acceptable level of service to the schools and departments it serves. To accomplish this, the Office of Information Technology and Instructional Technology have applied various methods of delivery including developing District hardware, software, and process standards that support District technology initiatives. OIT understands that the more standardized the Information Technology (IT) environment becomes, the more it is able to minimize downstream support costs.

The District's commitment to standardization is evidenced by the formation of the Technology Standards Committee that is comprised of individuals from OIT, Instructional Technology, Procurement, Finance, and Management Audits. This committee approved the issuance of an RFP that resulted in a list of 25 qualified pre-approved vendors that provide desktop computers to the District. By developing this standard list of suppliers, the District saves the time and expense of competitively bidding out potentially thousands of desktop computers one or two at a time. However, the savings derived from increasing competition by keeping 25 vendors on the list is negated by the costs associated with supporting a variety of aging computers from multiple vendors.

Standardize hardware platforms to one or two vendors

By standardizing on fewer vendors, the District can still "gain purchasing leverage but also reduce incompatibility issues, support costs, vendor liaison requirements, testing of new technology, as well as reduce the administrative costs of vendor management." [14] By limiting qualifying vendors to one or two the District can realize a reduction in the total cost of ownership (TCO). In so doing the District can reduce the purchase price by 10-15%, eliminate the need for redundant RFPs, minimize Help Desk costs as support is streamlined toward a standard hardware environment, lengthen the life of systems as technicians can cannibalize interchangeable parts, and reduce technical training costs because technical support staff will support a fewer number of platforms.

At Miami-Dade County Public Schools, technology growth is evolving at a rapid pace. Since May 1999, more than 21,000 computers have been added to the District's Instructional Technology inventory. [15] An escalating customer demand on the part of administrative and instructional computer users and a rapid acceleration of the complexity of the desktop computer results in insufficient staff to service the demand for support. The result is a situation where staffing levels increase and/or the level of service declines.

Multifunctional Devices

During our office visits to the District, it was not unusual for groups of offices to have one or more printers per individual office. Berkshire Advisors believes in addition to developing standards for desktop computers, the District should actively look at standards for printers, file servers, copy machines, and facsimile machines. The District should place a moratorium on buying new printers until an assessment has been made of the most efficient

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[14] Compaq White Paper - *Total Cost of Ownership*

[15] Number provided by the MDPCS Division of Instructional Technology and Media Support Services

distribution of its existing printers. If it is determined that new printers are to be purchased, the District should consider standardizing purchases based on District-wide use of multifunctional devices (MFD). MFD devices are all-in-one devices and have the capability to print, copy, fax and scan.

By using multifunctional devices, savings can be realized in supplies and power usage as well as the initial investment of the printing, copying, faxing or scanning device. In addition to adopting the use of multifunctional devices, the District should give serious consideration to having an independent firm perform an analysis of the District's and individual school's document requirements. Technology has evolved to a point that in many instances, hardcopies of documents are no longer required. With a little training and the correct equipment, the District has the potential of realizing substantial savings.

In the next section of this document, Berkshire Advisors recommends that the District study the possibility of implementing a seat management strategy to reduce the total cost of ownership of technology acquisitions. We believe a seat management program is the most cost effective approach.

Recommendations ———————————————

- *We recommend that the District standardize hardware acquisitions to one, or possibly two, vendors.*

    Action Plan 6-5 provides the steps needed to implement this recommendation.

Action Plan 6-5

Standardize hardware platforms acquisitions to one, or possibly two, vendors	
Strategy	ITMAP assigns the Technology Standards Committee with the task of standardizing workstations, file servers, and printer platforms and assigns Procurement and Materials Management staff with the task of writing the RFP.
Action Needed	Step 1: The Committee develops specifications for desktop computers, printers and file servers.
	Step 2: Procurement and Materials Management staff develops an RFP to accommodate the hardware specifications and the vendor requirements.
	Step 3: The Information Technology Management Advisory Panel (ITMAP) reviews, approves and issues the RFP.
	Step 4: ITMAP reviews the proposals.
	Step 5: ITMAP recommends one or two vendors for the various platforms.
	Step 6: The District begins purchasing from the standard hardware vendor platforms.
Who is Responsible	Information Technology Management Advisory Panel (ITMAP)
Time Frame	May 2002 through May 2003
Fiscal Impact	This recommendation can be accomplished as part of the District-wide technology planning process.

Source: Berkshire Advisors, Inc.

5   The District provides technical support for hardware, software, and infrastructure in a timely and cost-effective manner. However, given the proliferation of technology, the District should consider alternative methods of technical support.

The District provides adequate support; however, given the increase in technology and the age of the computer inventory, it should analyze the costs and benefits of implementing a seat management strategy

The District does a good job of providing technical support to schools and administrative offices within the existing infrastructure using available resources. This support is delivered from two organizations, the Office of Information Technology and Instructional Technology.

At a minimum, all schools share technicians. For larger schools a dedicated resident technician is onsite to address the technical support needs of the school. Currently, there are approximately 18 individuals who provide support to Administrative desktops via OIT Field Support Services, while 154 individuals provide support to instructional desktop computers. However, as pointed out earlier, the proliferation of desktop computers in the District is driving a demand for more technicians.

Using reports that are produced from the Peregrine Help Desk System[16] and reviewed daily by OIT, help desk staff decisions are made on prioritization of calls and escalation of call tickets if needed. (At this time, there is no formal help desk for Instructional Technology. However, the Peregrine system can handle the added volume.) Meetings are scheduled on a regular basis with the appropriate individuals or vendors to proactively discuss with technical support staff upcoming requirements as well as ad hoc meetings to discuss immediate issues or problems.

The District Technology Standards Committee developed a standard that includes a three-year on-site service agreement with all computers purchased. Also, prior to computers being ordered, the department receiving the technology contacts OIT to have a field technician determine how much (if any) wiring work is required. If the computer ordered is for Instructional Technology, the cost of setting up the computer is included in the cost of the technology.

While the processes in place adequately accomplish the task of recording a call ticket and assigning a technician to fix the problem, as the proliferation of desktops, printers and servers continues, the ability of both OIT and Instructional staff to maintain a satisfactory service level will diminish. The District estimates that in order to provide adequate technical support to District schools, 117 technicians should be added to the staff, which increases the total cost of ownership.

Seat Management Program

In order to reduce the total cost of ownership, Berkshire Advisors recommends that the District look into implementing a seat management program. A seat management program is the process by which one or two vendors is responsible for acquisition, setup and installation of desktops and peripherals. In addition, the seat management vendor(s) would be responsible for help desk and technical support on all desktops installed under the agreement. Berkshire believes that to evolve the unit cost of a seat management program is one of the most critical components to consider in selecting a vendor within a seat management strategy.

Because all desktop computers come with a three-year warranty, any break/fix activity on newer desktops or peripherals is taken care of by the supplying vendor, thus leaving only out-of-warranty desktops and peripherals

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[16] Peregrine is the help desk application used by OIT to track user calls requesting support services.

requiring support by District technicians. In most instances, for a minimal fee, the vendor supplying the seat management program will take on the task of supporting out- of-warranty equipment. This can translate to significant savings on the part of the District when one considers the number of technicians currently employed to accomplish this activity.

Currently, the District has a mix of newer and older technologies. As the proliferation of desktops, printers and file servers continues, the estimated cost of adding the appropriate number of technicians is $4.8 million a year. [17] Outsourcing the acquisition, setup and maintenance of desktop technology can not only eliminate the need for additional technicians but also reduce the number of permanent technicians needed in the future. If timed appropriately, the District can realize additional savings by using E-rate dollars to purchase server and network support. [18]

Berkshire Advisors recommends that the District contract with a 3[rd] party vendor (as part of developing a District-wide strategic technology plan in Action Plan 6-2) to assist the District in its ongoing effort to analyze the costs and benefits of implementing a seat management strategy in technology acquisitions. We believe that the study will reveal that by implementing a seat management strategy the District can realize substantial savings by reducing the cost of owning and maintaining its technology inventory.

Berkshire Advisors believes that the analysis will reveal that by implementing a seat management strategy, the District can save between $25 million and $47 million over a 5-year period. The success of the seat management program will require that the District standardize hardware platforms to one or two vendors (see Action Plan 6-5), saving 10-15% on hardware and equipment, and in so doing can realize savings in support costs of $29 million over the same 5 years.

Exhibit 6-15

Cost Savings Calculations With a Seat Management Implementation

	Current Situation		With Seat Management	
	No. of Technicians	**Cost @ $26K (fringe benefits not included)**	**No. of Technicians**	**Cost @ $26K (fringe benefits not included)**
Current Technicians	154	4,004,000	46	1,196,000
Needed Technicians	117	3,042,000	0	
Total	271	$7,046,000	46	$ 1,196,000
Savings over 5 year period:				**$29,250,000**

Source: Berkshire Advisors, Inc., based on data from MDCPS

The District currently employs 154 technicians to support computers and networks in the classroom. The annual cost of these technicians is conservatively $4 million. The District has identified the need for hiring 117 additional technicians as permanent staff. However, if a seat management strategy is employed, we believe that the District can eliminate the need to hire new technicians and reduce the current number of technicians over time. Assuming the District will have to retain 30% of the technicians currently employed to perform non-warranty work, 46 of the technicians would remain. This would save approximately $5.8 million annually, or $29 million over five years.

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[17] Based on information received from the District on February 26, 2002

[18] E-rate is a federal program that provides funds to school districts for connecting students to the information highway. As the District is aware, filing of the correct documentation during the months of November and December with the Schools and Library Division of the FCC can result in the approval of E-rate funding for the upcoming fiscal year.

Recommendations

- *The District should analyze the costs and benefits of implementing a seat management strategy. We believe that a study of this kind will reveal that the District can realize significant savings by implementing such a strategy.*

Action Plan 6-6 provides the steps needed to implement this recommendation.

Action Plan 6-6

The District should analyze the costs and benefits of implementing a seat management strategy		
Strategy	Assign responsibility to the CIO for developing a seat management strategy.	
Action Needed	Step 1:	The CIO brings together a committee to review a seat management strategy. The review should incorporate the research done by OIT, the Technology Standards Committee and the Procurement and Materials Management staff.
	Step 2:	As part of developing a District-wide strategic technology plan (in Action Plan 6-2), create a component of the plan to perform a cost/benefit analysis of a seat management strategy. This component will include District staff working with the 3rd party vendor used in Action Plan 6-2.
	Step 3:	ITMAP approves the proposed component, which should have a heavy emphasis on approach to evolve a per unit cost of the seat.
	Step 4:	The component is integrated into the RFP in Action Plan 6-2.
	Step 5:	ITMAP and the vendor perform the analysis.
Who is Responsible	CIO and Seat Management Committee	
Time Frame	May 2002 through May 2003	
Fiscal Impact	This recommendation should be accomplished as part of the District-wide technology planning process.	

Source: Berkshire Advisors, Inc.

6 The District has a professional development plan that reflects the District's vision of integrating technology to enhance and enrich the learning environment, as well as to improve administrative support. However, to fully take advantage of the efficiency gains that can be realized by technology, we recommend that the District mandate certificated staff attend scheduled technology training.

The District should review current policies in place that prevent it from mandating that instructional staff attend scheduled technology training

The District has done an admirable job in training teachers to integrate technology into the classroom. However, like most school districts across the U.S., the District does not mandate technology training for its certificated staff. The District has expended billions of dollars in hardware, software, and infrastructure and yet teachers are not required to demonstrate computer competency relative to integrating technology into the curriculum nor are they required to attend scheduled training programs. We are clearly at a point where student technology use in schools

should no longer be based on individual teacher choice, but rather on what pedagogy best prepares students for future success in the workplace.

The District's Professional Development Department sends out a general survey annually to District departments. The survey determines what type of training will be required for the upcoming year. As a result of the survey and the District's experience, the District offers a comprehensive catalog of training programs. Types of classes could include technology training, training on developing a budget, clerical training, safety, etc.

However, training is not mandatory. Once the classes are set up, all too often, training is scheduled but the teacher does not attend. Mandatory training will assist the District in increasing the percentage of teachers in the Stage II – Adaptation (42.01%) and Stage III – Transformation (16.23%) phase of technology literacy as it relates to the classroom. [19]

Additionally:

- Presently, the District recommends rather than mandates performance criteria.

- Professional development is based on Goal Three of the District technology plan that is approved by the state but is not approved by the school board.

- Professional development uses a three-phased approach to technology training. All courses offered are in support of improving the skill level of participants. The three phases of training are: Entry level, Adaptive level, and Transformation level.

- The District maintains nine training facilities with no apparent scheduling conflicts.

Recommendations

- *Berkshire Advisors recommends that the Technology Proficiency Plan developed by the Division of Instructional Technology and Media Support Services be forwarded to the School Board for approval to mandate that all teachers attend scheduled technology professional development.*

Action Plan 6-7 provides the steps needed to implement this recommendation.

Action Plan 6-7

Mandate that certificated staff attend budgeted technology training		
Strategy	Assign the task of mandating scheduled technology training for teachers to the Deputy Superintendent for Education.	
Action Needed	Step 1:	The Deputy Superintendent commissions a committee to review any barriers to training attendance for academic staff and to review the Technology Proficiency Plan.
	Step 2:	The committee presents preliminary findings to the Deputy Superintendent.
	Step 3:	The Deputy Superintendent reviews the findings with the Superintendent and provides a recommendation.
	Step 4:	The Superintendent takes the recommendation to the Board for adoption.
Who is Responsible	Deputy Superintendent for Education	
Time Frame	May 2002 through October 2002	
Fiscal Impact	This recommendation can be accomplished with existing resources.	

Source: Berkshire Advisors, Inc.

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[19] Percentages based on the reported Professional Development statistics, *2001 Technology Resources Survey*, Florida Department of Education.

7 The District provides professional development for the instructional technologies.

Instructional Technology is doing a commendable job in delivering professional development

All professional development provided by Instructional Technology is geared to integrating technology into the curriculum. Teachers leave training with a product – "what they learned." – the conclusion of a training session. Most training is at least two-days where teachers engage in dialog to discuss and to demonstrate the product they created during the session. In addition, Instructional Technology offers online teacher training.

While the District offers a comprehensive catalog of training courses, professional development time is a site-based decision. The District offers opportunities for staff to attend regional and national conferences in addition to its own Technology Conference. Moreover, the District encourages attendance and participation at conferences and training seminars outside of the District, as well as offering onsite and online training. Again, although doing a commendable job in delivering professional development, the lack of mandatory attendance hampers the District's ability to increase the percentage of teachers attaining Stage II and Stage III level of proficiency.

Appropriate Technologies───────────────

8 The District bases technology acquisitions on instructional needs and makes technology acquisitions based on those needs.

The District's technology acquisition process is founded on sound research, planning and evaluation methodologies

Instructional Technology performs extensive research in developing recommendations for adopting instructional technology needs. The research is focused on evolving the best solution for the program under consideration at the best possible price. Research includes networking with other educators across the U.S., attending conferences by Instructional Technology staff, research on the Internet and meetings with vendors explaining their approach and solutions.

As the entity responsible for managing public school technology funds, Instructional Technology demonstrates using the results of research to initiate new programs. For example, to benefit from economies of scale, District-wide purchases of software and other electronic resources are initiated based on instructional program needs. Instructional Technology is also responsible for managing the replacement of instructional computers. As such, this department has initiated large computer purchases for the replacement program. Otherwise, the majority of technology acquisitions in the District are initiated at the individual schools.

The District's Technology Standards Committee performs the function of adopting and updating technology platforms. The committee is composed of Dr. Dan Tosado, Associate Superintendent OIT; Chris Master, Director Instructional Technology; George Balsa, Chief Auditor; Henry Fraind, Dep. Supt. Schools (retired); Rose Barefield-Cox, Chief Procurement Officer. Recommendations are made to this committee by District staff. This committee has been in place for two years.

The Technology Standards Committee meets, as needed, which generally equals once or more a month. The trigger for the committee to meet is a single anticipated order over $70,000 and/or a request for a particular vendor, or a specific circumstance identified by a committee member or by an individual or office in the field. The $70,000 threshold was determined by analyzing computer purchases from all locations over a period of time. Single orders below $70,000 can be made without going to bid. Further, there is a flag in place on requisitions to preclude locations from splitting orders to avoid the threshold. The Procurement Advisory Committee oversees purchases.

9   The District bases technology acquisitions on the results of research, planning, and evaluations of previous technology decisions to ensure technology decisions are cost-effective.

The District's technology acquisition process is founded on sound research, planning and evaluation methodologies. However, the District should consider alternatives to developing and maintaining custom software

The Office of Information Technology has developed processes for acquiring new technology for the District. The process is documented and solicits input from Instructional Technology staff as well as other stakeholders. To further its research, the District actively participates in a number of organizations that provide information and national standards on technology acquisition.

Software Technology Acquisition

The Office of Information Technology utilizes both in-house development and packaged software in providing solutions to meet District needs. Every request for a new application is reviewed on a case-by-case basis using the following method.

OIT researches available packaged software first. If a package is found that meets requirements and is within budgetary constraints, a pilot is implemented at no cost to the District.

Upon a successful pilot, package purchase and subsequent deployment follow.

If the software is found unsuitable during pilot or is cost prohibitive, OIT analyzes the scope and cost of an in-house developed solution.

Hardware Technology Acquisition

The District Technology Standards Committee determines hardware specifications for the District. Input to this committee is provided via input and feedback from individuals within the District, input from external sources and research on the part of OIT and Instructional Technology staff. All purchases conform to legal requirements and are subject to purchasing department oversight. In addition, the Procurement Advisory Committee oversees the purchases.

Two recommendations previously made in this chapter affect the District's purchasing strategy. By implementing the recommendation to standardize desktop, printer and server acquisitions to one or two vendors, the number of vendors to manage would shrink. Additionally, in the event a seat management strategy is employed, the District will no longer be required to purchase the hardware.

Business Systems Acquisition

Berkshire Advisors believes the District should review its strategy of developing customized software. At this time, the District develops software to maintain legacy business applications that were originally installed in 1982. The systems are no longer supported by the implementing vendor and have been modified extensively by the District. Furthermore, the District has chosen to custom develop an assessment management application even though an existing system already has the functionality users need.

Evolution in Technology

Early computer systems were designed by replicating the workflow of each department they processed data for. A system was designed for human resources, one for finance and so forth. Each contained redundant data (e.g., employee name, number, etc.). Later systems reduced redundant data but failed to study workflow in the context of all departments. Systems today have been designed to encourage users to redefine their business processes to reduce and/or eliminate redundancy.

We commend the Office of Information Technology (OIT) for its excellence in keeping legacy systems operational. However, we believe the District should rethink its strategy of developing customized software.   The District should consider an Enterprise Resource Planning (ERP) [20] solution that enables the District to reduce its dependence on customized software and to streamline its business processes which can result in significant productivity gains.

At this time, most of the Fortune 500 companies use 3[rd] party systems to meet their business needs – finance, human resources, payroll, purchasing. Companies implement these systems to take advantage of best practice business processes and integrated workflow. In so doing, the District can reduce the demand for programming staff, freeing valuable technical resources to support newer, more efficient systems. Many school districts also have or are in the process of implementing ERP solutions – some successful, some not. San Francisco Unified School District implemented PeopleSoft [21] with limited success. Houston ISD implemented a combination of PeopleSoft and SAP[22] with success. Dallas ISD is in the process of implementing Oracle Financials [23]. Clark County is considering replacing its legacy systems with an ERP solution. These are but a few examples of activity in progress at other school districts.

Summary

Information technology is a powerful tool for achieving the District's educational goals. Acquiring equipment and launching websites, while extremely helpful, does not address an underlying problem in the District – the perpetuation of customized software to develop new applications and to maintain or enhance existing ones. In our opinion, there has to be a paradigm shift from merely meeting the customer's request to understanding the customer's request in the context of total workflow.

Relying too heavily on customized software puts the District at risk by perpetuating the need for more customization. Because software has evolved dramatically since 1982, we recommend that the District consider an ERP solution as an alternative to perpetuating the development of customized software. Coupling reduced or level budgets with an increasing demand for products and services we believe should induce the District to consider alternative ways to enhance the delivery of its products and services.

Berkshire Advisors recommends that the District include, as part of developing a District-wide strategic technology plan, a detailed study to determine the upfront costs and eventual savings that can be realized by a packaged ERP solution. To accomplish this, the District should hire a qualified firm to review current legacy systems and make an independent recommendation regarding the available alternatives. Berkshire Advisors believes that while the cost to

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[20] The process of looking at the total solution, not standalone systems.
[21] 3[rd] Party ERP Solution
[22] 3[rd] Party ERP Solution
[23] 3[rd] Party ERP Solution

replace systems may seem exorbitant, one can assume that the useful life of any system implemented would be 10 years. Couple the life of the system with the total monies that will be managed through its use (MDCPS budget over 10 years is approximately $45 billion - $50 billion), an investment in a new system of $100 million represents 2/10 of 1% of the $45 billion. [24]

Recommendations

- *We recommend that the District review its strategy of developing customized software and consider alternative methods such as an ERP solution for delivering IT products and services.*

Action Plan 6-8 provides the steps needed to implement this recommendation.

Action Plan 6-8

Review the strategy of developing customized software and consider alternative methods such as an ERP solution for delivering IT products and services		
Strategy	The District and an independent consultant review alternative methods for delivering IT products and services.	
Action Needed	Step 1:	The CIO forms a committee to develop a component of the strategic technology plan (in Action Plan 6-2) that includes reviewing alternative methods for delivering IT products and services with the objective of minimizing the District's dependence on developing customized software.
	Step 2:	The committee develops the component.
	Step 3:	The component is integrated into the RFP in Action Plan 6-2.
Who is Responsible	CIO	
Time Frame	May 2002 through May 2003	
Fiscal Impact	This recommendation should be accomplished as part of the District-wide technology planning process.	

Source: Berkshire Advisors, Inc.

10 The District has established standards for acquiring new programs and digital content that promote the integration of technology into everyday curricular needs.

The District's Instructional Leadership Committee and the Technology Standards Committee take a lead role in establishing digital content standards and integration policy

The District has established minimum standards for hardware and software procurement, which are detailed in the acquisition contract of which there is two years remaining. Additionally, given that technology is moving at a rapid pace, these standards are constantly reviewed and updated when required. Also, prior to the acquisition of newer

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[24] Dallas Independent School district has budgeted $30.3 million to accomplish this objective. MDCPS can expect this number to possibly exceed $40 million.

technology, the Office of Instructional Technology takes a lead in testing the new standard prior to agreeing to make it available for general procurement.

For educational content, District curriculum specialists publish lists of recommended instructional courseware that is compatible with existing systems and aligned with District and state standards. Previously the District had a software preview center but because it was underutilized, curriculum specialists and regional technology specialists now attend monthly software presentations.

The Office of Information Technology developed and currently maintains the official District portal www.dadeschools.net. Within the District portal, the Division of Instructional Technology and Media Support Services has created an instructional portal, which includes online professional development, instructional software resources, tools for assessment, and lesson planning. The instructional portal is used by a significant number of certificated staff. The portal approach ensures equitable access across the District and at the same time gives the District the benefits of economies of scale. Currently, the portal demonstrates an attempt to meet the needs of all members of the learning community, yet its organization is clearly fragmented.

We recommend that a comprehensive, cohesive approach to the continued development of the portal should continue. This should include procuring and developing integrated applications and resources, which are driven by instructional needs.

Recommendations ———————————————

- *We recommend that the District develop standards and procedures by which the portal should be populated and managed.*

   Action Plan 6-9 provides the steps needed to implement this recommendation.

Action Plan 6-9

Develop standards and procedures by which the portal should be populated and managed	
Strategy	Evolve standards and procedures to continue populating the District's portal.
Action Needed	Step 1: Both the Administrative Director for Instructional Technology and the CIO puts together a committee to oversee portal standards and procedures development.
	• Clearly define areas of responsibility
	Step 2: Review existing portal activity
	Step 3: Present Portal recommendations to the Technology Steering Committee.
	Step 4: Adopt and implement recommendations.
Who is Responsible	Administrative Director forInstructional Technology and the CIO
Time Frame	May 2002 through May 2003
Fiscal Impact	This recommendation can be accomplished with existing resources.

Source: Berkshire Advisors, Inc.

11 The District has a stable and efficient infrastructure; however, as part of the District-wide technology planning process, the District should assess future infrastructure needs and develop cost effective strategies to maximize service delivery.

The District has implemented a solid standards-based infrastructure that meets today's basic data communication needs; however, it should consider making future changes in Wide Area Network (WAN) methodologies and strategies that result in better performance and increased capacity [25]

Stable Network Infrastructure

The District has a stable infrastructure in place that achieves the current objectives it has set for itself relative to connectivity. However, schools with larger student populations will require greater bandwidth availability and reliability beyond what is currently provided. Currently the District uses protocol prioritization to ensure access to mission critical business application bandwidth availability across the Intranet. The District should better posture itself for the growth of applications delivered to the classrooms and business offices that will require more bandwidth, and for greater reliability of Internet and Intranet connectivity. The District should measure and evaluate current bandwidth utilization at the largest population schools, typically found at middle and high schools, and adjust bandwidth delivery for these schools to average around 50% utilization or less to insure peak periods don't negatively impact response time.

At this time, E-rate dollars are available to the District for infrastructure enhancements. As a result, the District should be proactively planning the growth of the network based on E-rate available dollars (in some cases 10 cents to 20 cents on the dollar). Taking advantage of E-rate dollars can mean that the network infrastructure will be available as bandwidth requirements increase, placing the District in a position to accommodate future growth in the network.

The District should address Internet and web access reliability. The weakest link in reliable Internet access by the schools rests with single-point-of-failure WAN links between each site and the OIT backbone. Currently, the District installs a second T1 line for schools reaching bandwidth capacity. The average bandwidth consumption at peak times during the day remains stable at 60%. [26]

There are definite overall cost benefits in simplifying the existing WAN network. One of the ways is to simplify through eliminating Frame Relay encapsulation and treating the WAN links as point-to-point connections using High-level Data Link Control (HDLC) encapsulation. Frame Relay networks are more complex and difficult to troubleshoot the larger they get compared to treating each WAN link as a point-to-point connection.

Frame Relay is designed for WAN network links consisting primarily of short bursts of traffic. Internet browsing traffic, telnet sessions and terminal emulator traffic are good examples of this type of traffic and are present components of network traffic at the District. However, with the increasing reliance on Internet and Intranet resource use in the schools, such as large file downloads, streaming video and audio, as well as the District's business applications, the nature of this traffic is better suited to T-1 circuits that use HDLC encapsulation rather than Frame Relay. Provisioning this change provides a good opportunity to further simplify the WAN infrastructure while providing a better model for scalability. The conversion, once determined to have little cost impact, should be relatively easy.

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[25] A Wide Area Network is a network that uses common carrier provided lines. The various types of common carrier connections determine the speed at which you connect to the Internet and the World Wide Web.

[26] Based on information received from the District on February 26, 2002.

The real downside to Frame Relay is that a point can be reached where data integrity is not guaranteed when a threshold called the Committed Information Rate (CIR) is surpassed. Passing the CIR threshold can also cause valuable bandwidth to be consumed by the retransmission of data. Since the District currently uses multiple DS-3 circuits to distribute communications from the WAN backbone to the remote sites via Frame Relay T-1s, the configuration change away from Frame Relay to HDLC is relatively easy and inexpensive.

It is important that the District monitor all Frame Relay circuits on a regular basis to check if the CIR threshold for each circuit is surpassed. When the CIR is surpassed regularly on a circuit, it is time to raise the CIR level on that circuit. This increases the circuit reliability and the circuit cost.

Infrastructure design should include desired performance under worst-case scenarios. Reducing the complexity of the network will help reduce operational costs and simplify network configuration and trouble-shooting time. Any cost savings would provide revenue to implement redundant network connections to all remote sites thereby ensuring remote site communication reliability while reducing network congestion.

Network Integrity

The District is proactive relative to maintaining the integrity of its network. The District utilizes a firewall and anti-virus software to ward off the most commonly known potential threats of unwanted network incursions. Virus cures are updated on servers and workstations at the District on a regular basis. However, the District is not using best practices in the deployment of its firewall.

A firewall is a critically important network component for individuals and organizations that connect to the Internet. The firewall is a system or group of systems that enforces an access control policy between two independent networks. The two networks are typically the Internet network and a local private network such as a school district. The actual means by which firewall access control policy is accomplished may vary. The firewall can be thought of as two security guards standing at the gate that joins the two networks. One guard blocks traffic from entering, the other permits traffic to leave. Only traffic with specific permission can enter or leave through the gate. Each guard makes the determination of who can enter or leave based on specific access control policies. In addition, there are usually one or more special access points through a firewall that common access from the public network (the Internet) is allowed to go. This is typically referred to as the Demilitarized Zone (DMZ). The District does not currently have a DMZ configured on its firewall.

Software viruses are cleverly designed to enter or leave through firewalls on permitted traffic or travel across private networks on the information sent from computer to computer. Viruses are hidden programs that infect computers and perform undesirable results. Their capabilities range from being minor nuisances to stealing any information on the computer and sending it to a prescribed recipient.

Anti-virus software resides on network servers and workstations. The anti-virus software for known virus types analyzes all traffic, sent or received, by these devices. The traffic viruses may be in the form of e-mail, an e-mail attachment or a file downloading from the Internet or some other storage device. When a virus is detected, the virus is removed by prescribed methods contained in a virus definition file. In some cases the infected file may be quarantined until manual action is taken. Thousands of new viruses are produced every month. Many are variations of existing viruses while some may be new. Anti-virus software companies produce updated virus definition files on a bi-weekly or weekly basis as new virus threats are discovered and their cures produced. Therefore, it is imperative that servers and workstations are updated bi-weekly or weekly with the latest virus definition file to ensure pro-active protection.

Special types of viruses, such as the Code Red virus, target specific weaknesses of computer operating systems. These viruses require special software updates to the computer operating system. Prior to the onslaught of the Code Red virus, the OIT staff warned the schools of the upcoming problem and spoke with school site personnel explaining the potential of Code Red problem and the security patches that should be applied to servers and workstations.

Efficient Network Infrastructure

Each District facility contains a Local Area Network (LAN) that controls traffic flow within the facility. Wide Area Networks (WAN) connect Local Area Networks together with telecommunications links and routers. Routers are high-speed computing devices that serve as network traffic travel agents and determine how the information sent over the network gets to the intended receiver. Routers have the ability to also send their status information to monitoring devices that know how to ask for it.

The District utilizes a number of commercially available tools to monitor its network infrastructure. The District uses HP Open View, an industry standard, to monitor network devices down to the router level and uses Cisco's NetRanger for intrusion and malicious activity detection. HP Open View is a status-monitoring program that runs on a UNIX or NT server. The program polls each router for its status information on a regular basis, usually every 5-10 minutes. HP Open View also has the ability to interface directly with many popular help desk trouble-ticket systems such as Peregrine and Remedy. This enables the help desk system to automatically open a work order, with all of the location information about the failed router and automatically assign the ticket, and/or send a page to the appropriate technician. The District utilizes Peregrine to track help desk calls and issue work orders to perform work that cannot be resolved by the help desk. The District demonstrated effective and efficient operation of the help desk operations through the use of Peregrine. However, the generation of statistical reports on a regular basis was impaired due to technical problems with the system.

Integration of Open View with Peregrine is highly recommended and will result in better customer service, provide for accurate reporting from the Peregrine database on network failures, equipment problems and service trends. These types of reports will enable the OIT department to be more pro-active in network performance, analysis, and maintenance, while providing metrics for assessing quality of service delivery.

The District has standardized its purchase of network equipment. The standard identifies Cisco router products for use in the WAN and either Cisco or Nortel products for Layer-2 Ethernet Switches in the LANs. The LAN standard is acceptable for today's purposes but could result in cross-platform problems resulting in higher support costs if the District implements application or devices which require Layer-3 switching in the future.

Recommendations ————————————————————

- *The District should assess future infrastructure needs and develop cost-effective strategies to maximize service delivery.*

Action Plan 6-10 provides the steps needed to implement this recommendation.

Action Plan 6-10

The District should assess future infrastructure needs and develop cost-effective strategies to maximize service delivery		
Strategy	Determine the value to students, teachers, and District staff for having a more robust, scalable and highly reliable WAN infrastructure.	
Action Needed	Step 1:	Identify stakeholders to sit on a review committee.
	Step 2:	As part of developing a District-wide strategic technology plan (in Action Plan 6-2), include a component that assesses future infrastructure needs and cost-effective strategies to maximize service delivery.
	Step 3:	Determine whether there are circuit cost savings in changing T-1 methodologies and whether Florida has an Education House Bill that puts service fee caps on regulated carriers.

	Step 4:	Develop funding and E-rate discount strategies.
	Step 5:	Integrate the component into the RFP in Action Plan 6-2.
Who is Responsible	CIO and stakeholder review committee	
Time Frame	May 2002 through May 2003	
Fiscal Impact	This recommendation should be accomplished as part of the District-wide technology planning process.	

Source: Berkshire Advisors, Inc.

- *The District should review the installation of redundant WAN links.*

Action Plan 6-11 provides the steps needed to implement this recommendation.

Action Plan 6-11

The District should review the installation of redundant WAN links		
Strategy	Determine the value to students, teachers, and staff for having a more robust, scalable WAN infrastructure, and highly reliable WAN links due to WAN link redundancy for schools and administrative sites.	
Action Needed	Step 1:	As a charge of the same stakeholder review committee as the recommendation above, determine the benefit to students, teachers and staff if access reliability to Intranet and Internet resources is improved significantly by implementing dual links to facilities.
	Step 2:	Adjust RFP deliverables accordingly.
Who is Responsible	OIT and stakeholder review committee	
Time Frame	May 2002 through May 2003	
Fiscal Impact	None, as it would be part of Action Plan 10.	

Source: Berkshire Advisors, Inc.

- *The District should conduct a network performance baseline assessment on the backbone and all WAN links every two to three years. Yearly performance metrics should be compared to the last baseline study to project accurate infrastructure scaling and budget requirements. Yearly performance metrics should also identify percentage of bandwidth used by each network application. Application network performance tools should also be used to ensure that all network applications planning to be deployed or already deployed are efficient users of bandwidth. Errant applications should be discarded, replaced or re-engineered.*

Action Plan 6-12 provides the steps needed to implement this recommendation.

Action Plan 6-12

The District should conduct a network performance baseline assessment on the backbone and all WAN links every two to three years		
Strategy	Perform baseline assessments in order to provide a clear point of reference in time for defining network and application performance metrics and deficiencies in LAN and WAN infrastructures in order to predict and plan for network capacity growth and its impact on fiscal budgets.	
Action Needed	Step 1:	Develop Request For Information (RFI) to identify qualified vendors for network performance baseline assessment and determine the various tools, methodologies and best practices used by qualified vendors in such an assessment.

	Step 2: Develop Scope of Work (SOW) document with clearly identified objectives, deliverables, recommendations and knowledge transfer expectations.
	Step 3: Embody SOW within an RFP.
	Step 4: Review and award the RFP to qualified vendor.
	Step 5: Perform assessment.
Who is Responsible	OIT Department
Time Frame	May 2002 through October 2002
Fiscal Impact	We estimate the one-time cost to the District to be no more than $150,000.

Source: Berkshire Advisors, Inc.

- *The District should consider implementing a firewall strategy with an isolated demilitarized zone (DMZ) segment to make hacking into host servers that reside in a DMZ strategy more difficult. The District could then move the District Internet name server, web server and e-mail gateway to a DMZ subnet. The existing firewall product used by the District is capable of providing this functionality with programming modifications.*

Action Plan 6-13 provides the steps needed to implement this recommendation.

Action Plan 6-13

The District should implement a firewall strategy with an isolated demilitarized zone (DMZ) segment to make hacking into host servers that reside in a DMZ strategy more difficult		
Strategy	Use the existing firewall product with the addition of an isolated, access rule controlled, demilitarized zone (DMZ) network segment where external Domain Name Server (DNS), Internet E-mail Gateway Server and Internet Web Servers are located.	
Action Needed	Step 1:	Use the existing firewall product with the addition of an isolated, access rule controlled, demilitarized zone (DMZ) network segment where external Domain Name Server (DNS), Internet E-mail Gateway Server and Internet Web Servers are located.
	Step 2:	Review existing firewall configuration and identify configuration changes required on affected routers, switches and firewall.
	Step 3:	Create a sequential "actions to be performed" list.
	Step 4:	Schedule time for implementing changes.
	Step 5:	Execute changes.
	Step 6:	Test hosts on DMZ for proper access and restrictions from Internet and Intranet networks.
Who is Responsible	WAN Department within OIT	
Time Frame	May 2002 through October 2002	
Fiscal Impact	The District estimates the one-time cost for this recommendation to be no more than $75,000.	

Source: Berkshire Advisors, Inc.

- *The District should continue with its plan to implement web-cache servers. This would speed up Internet traffic and conserve on average 50% of the available 100Mb bandwidth to the FIRN Internet connection thereby prolonging the need to increase Internet bandwidth. Currently, according to its data, the District is consuming 60% of its available Internet bandwidth. Web-cache servers would drop this to around 30% consumption, thereby extending growth headroom.*

Action Plan 6-14 provides the steps needed to implement this recommendation.

Action Plan 6-14

The District should continue with its plan to implement web-cache servers		
Strategy	Implementing web cache servers will result in greater efficiency of available bandwidth utilization of Internet traffic.	
Action Needed	Step 1:	Identify products to evaluate and review.
	Step 2:	Develop a product comparison criteria matrix.
	Step 3:	Request and schedule product evaluations for multiple cache products testing each for at least 45 days on the District's network.
	Step 4:	Update comparison matrix for each evaluation.
	Step 5:	Determine best product fit for District needs.
	Step 6:	Acquire product through purchasing process.
	Step 7:	Implement.
Who is Responsible	WAN Department with OIT	
Time Frame	May 2002 through October 2002	
Fiscal Impact	This recommendation can be accomplished with existing resources.	

Source: Berkshire Advisors, Inc.

Use of Technologies————————————————

12The District has established and communicated a policy stating appropriate uses of all types of technology resources, including computers, video equipment, software, and the Internet.

The District should modify the Acceptable Use Policy to require supervision while a student is on the Internet

The District has an Acceptable Use Policy that describes appropriate uses of all types of technology resources including computers, video equipment, software, and the Internet. For the most part, this policy is comprehensive and covers a broad range of issues including:

- Appropriate content and classroom use of web pages;
- Guidelines describing the appropriate and inappropriate use of technology (including school computers, the Internet, copiers, facsimile machines, and TV/VCRs); and
- Guidelines describing the legal uses of both instructional and non-instructional video materials.

One shortcoming in this policy, however, is that it does not specify that students are not allowed to access the Internet without supervision. Instead, the District's current practice is for parents to complete a form allowing the student's access to Internet content.

The District has done an effective job of communicating its Acceptable Use Policy

Employee survey results suggest that the District has done an effective job of communicating its Acceptable Use Policy to employees. More than two thirds of the survey respondents (67%) "agree" or "strongly agree" with the statement, "I have been provided guidelines describing the appropriate and inappropriate uses of technology, such as school computers, the Internet, copiers, facsimile machines, and TV/VCRs." Only 8.8% of the survey respondents "strongly disagree" with this statement. Moreover, slightly fewer than three out of five survey respondents (58.7%) "agree" or "strongly agree" with the statement, "I have been provided guidelines describing legal uses of digital materials" and only 11.3% of the survey respondents "strongly disagree" with this statement.

Recommendations

- *Modify the current Acceptable Use Policy to include supervision while a student is on the Internet.*

Action Plan 6-15 provides the steps needed to implement this recommendation.

Action Plan 6-15

Modify the Acceptable Use Policy		
Strategy	Revisit the Acceptable Use Policy (AUP).	
Action Needed	Step 1:	The Administrative Director, Division of Instructional Technology and Media Support Services initiates an amendment to Board rule 6Gx13-6A-1.112. [27]
	Step 2:	The draft AUP is presented to District legal for review.
	Step 3:	Legal approves the AUP as to form.
	Step 4:	The Administrative Director puts adoption of the revised AUP on the Board agenda.
	Step 5:	The AUP is adopted and implemented.
Who is Responsible	Administrative Director, Division of Instructional Technology and Media Support Services	
Time Frame	May 2002 through August 2002	
Fiscal Impact	This recommendation can be accomplished with existing resources.	

Source: Berkshire Advisors, Inc.

13 The District supports compliance with the established policy on safe and legal use of technology resources.

The District takes appropriate steps to ensure the safe and legal use of technology resources

The District has established effective practices to ensure the safe and legal use of technology resources. Roles and responsibilities regarding the appropriate use of technology resources have been appropriately defined. The Office of Information Technology develops and implements policy and programs for District systems while system users

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[27] Board Rule Acceptable Use of the Internet, based on information received from the District on February 26, 2002

are responsible for determining who should have what type of access to systems consistent with these polices. Moreover, individual departments, with input from the Office of Information Technology, are responsible for ensuring appropriate controls are in place. Assigning responsibility for the safe and legal use of technology with individual departments and units is sound, especially in an organization as large and diverse as the MDCPS. In addition, the District uses a number of hardware and software tools to assist it in ensuring a safe and secure programmatic and physical environment. These tools include lockdown devices where required, secure rooms when necessary and virus protection software for all systems.

Business Systems

14 While the District generally segregates duties to reduce the risk that unauthorized transactions will be entered and not discovered quickly, the current assignment of the OIT function to the Chief Financial Officer is inappropriate.

Until recently all information technology functions were appropriately segregated

The Office of Information Technology has appropriately segregated duties to reduce the risk that unauthorized transactions will be entered and not discovered quickly. Responsibility for application systems development (i.e., design and programming), maintenance and system software, and operations has all been assigned to separate organizational units. In addition, personnel policies and procedures have been established to ensure the integrity of information systems. Reference checks are performed for all new employees and employee duties are rotated from time to time. Security procedures are in place to eliminate access to the District's data systems immediately after an employee has been terminated.

The current assignment of the Office of Information Technology to the Chief Financial Officer is inappropriate.

While the District generally segregates duties to reduce the risk that unauthorized transactions will be entered and not discovered quickly, the current assignment of the OIT function to the Chief Financial Officer is inappropriate. This reporting relationship is not only in clear conflict with the Commissioner of Education best practices which have been adopted by the state, but also with practices employed in most large K-12 school districts across the United States. When information technology reports directly to one of the operating departments for which it processes data, the independence of the information technology function is compromised and the risk that data might be inappropriately manipulated increases. (Please note, however, that there is no indication whatsoever that anything inappropriate with regard to the manipulation of data is currently taking place in the Miami-Dade County Public Schools.)

Recommendations

- *As discussed in finding 1, Berkshire Advisors recommends that the Office of Information Technology report directly to the MDCPS Superintendent.*

  Action Plan 6-16 provides the steps needed to implement this recommendation.

Action Plan 6-16

Assign responsibility of the Office of Information Technology to the Superintendent MDCPS		
Strategy	Reassign OIT to the Superintendent.	
Action Needed	Step 1:	Assign responsibility for information technology to the recommended Chief Information Officer.
	Step 2:	Assign the Chief Information Officer to report directly to the Superintendent.
Who is Responsible	MDCPS Superintendent	
Time Frame	June 2002	
Fiscal Impact	This recommendation can be accomplished with existing resources.	

Source: Berkshire Advisors, Inc.

15 The District's user controls ensure authorization prior to processing transactions and ensure all output represents authorized and valid transactions.

The District has adequate user controls

School funding is partially based on Full Time Equivalency (FTE) formulas weighted by educational program enrollment as defined by state rules. All the student academic and demographic information required for FTE is stored in the Office of Information Technology (OIT) mainframe, which is secured by Resource Access Control Facility (RACF). [28] This in itself effectively limits access to the data.

A number of large complex MDCPS systems (ISIS for student and course information, DECO for K-12 FTE, and DECA for adult/vocational FTE, and FASTER for permanent record and transcript system, among others) incorporate many on-line screens, and use batch reports to create, store and send the data to the state. These systems produce a number of batch reports for both the schools and central administration to monitor the recording of the data. The sheer complexity of the mainframe systems is also a form of security in that they are not intuitive and simply cannot be entered and used to modify data without a great deal of knowledge.

MDCPS has a full time office (the FTE Office) within the Division of Attendance Services, which audits District and school FTE recording activities. All FTE applicable data and systems are available to FTE staff. This office has a number of FTE specialists who go out to schools and audit teacher grade books, attendance, computer records and other related material on site. This office also conducts a number of workshops every year to keep all District staff apprised of the latest local and state requirements. Staff members at OIT responsible for help desk functions are in constant contact with school personnel and work closely with them to keep data maintained accurately. This staff also has access to all data and would catch most discrepancies. Strict auditing procedures are applied not only by MDCPS but also the state. The state of Florida regularly audits schools looking for discrepancies.

There are five different FTE reporting periods and very specific data is reported in each of these periods. The state requirements are complex and must be followed precisely. Any deviation can result in loss of funding. In the fiscal year ending 6/30/1999, the date of the last audit by the Florida Audit General, MDCPS lost approximately $167,000 out of a total of $991,000,000. [29] This represents an error rate of about .016, which the Audit General's staff said was the lowest error rate of all the Districts in the state.

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[28] RACF is a security application.

[29] Audit dated March 2001, report number 01-083

All school system security policies apply, especially to this type of data, and are to be followed at all times by all staff. These include limiting physical access to the administrative machines that have mainframe connections to authorized staff only and meeting all requirements in the MDCPS Network Security Policy. The Network Security Policy mandates measures such as updated anti-virus software (to prevent access to the machine via Back Orifice and the like), timeouts and passwords. In all aspects, the site supervisor is responsible for seeing that correct procedures are followed and is held liable if they are not. Failure to conform to proper data entry procedures is seen as a serious matter and is punishable.

16 The District's applications are designed to provide users with reliable data.

The District's applications are developed and in compliance with its standards manual

The District has taken appropriate steps to ensure that its applications are designed to provide users with reliable data. Most notably, effective controls have been established and are monitored by the various OIT departments. These controls include programmatic controls that provide for checks at the data element level as well as transactions reports, which are produced by applications and can be used by users to review data quality. In addition, the District has taken steps to ensure that input data is edited and validated. Applications have also been designed to facilitate the tracing of computer output to data source and vice versa.

17 The District has established general controls in the areas of access, systems development and maintenance, documentation, operations, and physical security to promote the proper functioning of the information systems department.

The District has established sufficient controls and procedures to ensure the proper functioning of the Office of Information Technology

The District has documented processes and procedures in place that promote the proper functioning of the Office of Information Technology. (The processes and procedures are summarized in a written policies and standards manual.) The effective processes and procedures that have been established include the following:

- Written specifications are required for new systems.
- Written specifications are required before modifications can be made to existing applications.
- Written procedures have been established to test and evaluate new systems to ensure they are designed to meet the District's information system needs.
- Written procedures have been established to test and implement changes in system software.
- Controls have been established over the use and retention of tape and disk files.
- Procedures have been established to ensure the timely backup of data and to protect against the loss of important files, programs, or equipment.
- A system of badges, restricted access and keyword/keypad access to computer equipment has been established to limit access to data processing equipment, tapes, disks, system documentation and application program documentation to authorized employees.

- A scheduling system has been established to govern the processing of required programs.
- Adequate supervision is required on all shifts.
- Procedures to be followed by computer operators have been documented.
- Controls are in place to limit access to and prevent the release of confidential and sensitive data.
- Procedures have been established within the data processing control function that govern the review and distribution of output.
- A written disaster recovery plan is in place.
- Adequate insurance is available to cover data processing equipment.

18 The District's management information systems provide data needed by administrative and instructional personnel in a reliable and timely manner.

The District provides data in a timely and reliable manner

The District's management information systems provide data identified and requested by management and instructional personnel in a reliable and timely manner. In addition, the data the District sends to other agencies meets generally accepted practices as evidenced by a positive review by KPMG[30] for the District's FTE DECO process.

19 The District should take steps to minimize the number of databases that are independent of its centralized computer systems.

The District has a number of disparate databases and should consider doing a database inventory

As a result of numerous interviews performed by Berkshire Associates, the consultants learned the diversity of database applications used and maintained by various user departments is widely varied. The key advantages to database standardizations and consolidations used within large dispersed organizations such as school districts is realized by providing a single common, fast interface through which data sets can be made relational and accessed across multiple databases by many users. Relational databases that are based on the Structured Query Language (SQL) standards offer the highest performance and cost/benefit.

The District tracks and maintains records relative to OIT operations and data processing. OIT does not track databases that are developed and maintained by the various user departments. Information contained in these databases usually consists of critically important information that is not readily available to central management's decision processes.

Additionally, it is important to note that an increase in standalone databases (in some cases, shadow systems) is in many cases a clear indication of the lack of confidence in the data available in the production systems.

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[30] KMPG audit July 2001 – September 2001

The District should perform a database inventory that would quantify, categorize and identify databases used within the various user departments. The database inventory would be evaluated to identify those databases that contain data important to administrative and business planning decision processes. Databases that are identified to contain important information should be prioritized and scheduled for conversion and consolidation based on the District database standard. The resulting cost and operational benefit to the District would be realized in more efficient business operations, easier reporting capability and wider availability of important data to more people.

Recommendations

- *The District should perform a database inventory that would quantify, categorize and identify databases used within the various user departments.*

Action Plan 6-17 provides the steps needed to implement this recommendation.

Action Plan 6-17

The District Should Perform A Data Base Inventory And Consolidate Where Possible	
Strategy	Collect disparate data base information to determine if capability already exists in OIT or if new systems are required.
Action Needed	Step 1: CIO assigns an individual to develop data collection methodology.
	Step 2: Inventory forms provided to disparate data base developers/users.
	Step 3: Results collected and analyzed.
	Step 4: Report provided to CIO, OIT for action.
Who is Responsible	CIO
Time Frame	May 2002 through March 2003
Fiscal Impact	This recommendation can be accomplished with existing resources.

Source: Berkshire Advisors.

20 The District has established appropriate controls related to electronic data exchange transactions processed through electronic media, and image processing systems.

The District does not do any Electronic Data Interchange (EDI) transactions.