

Review of statement made to BOE (13Mar.2003):
“MMSD can realize savings by using Macintosh computers”

Presentation by Tina Murray:

Ms. Murray compared costs associated with 4 Macintosh and 4 PC computers and then extrapolated to deduct a savings of \$7,300,000 per year if MMSD made a one-time purchase of 2,037 Macintosh computers. The table below, reflecting Ms. Murray’s data, is edited to reflect the same costs used in her presentation, except all costs presented here have been divided by 4 to present data for single machines. [Each itemized expense has been numbered to aid references to discussion below.]

Ms. Murray’s data:	\$/PC	\$/Mac
direct costs:		
1. hardware	\$1,050	\$1,400
2. software	\$1,400	\$25
3. direct technical support	\$1,025	\$250
Indirect costs:		
4. lost teaching time	\$1,700	\$575
5. file mgmt	\$800	\$125
6. learning OS	\$600	\$50
7. staff training	\$950	\$625
8. trouble-shooting	\$425	\$50
total costs:	\$7,950	\$3,100

Note: Ms. Murray extrapolated savings by multiplying her cost calculations, times 2,037 units. Per table below, regardless of her calculated tech support costs or indirect costs, this implies MMSD would spend nearly \$5 mil for just over 2,000 PCs.

	PC	Mac	ex all funding sources: F02:
hardware	\$1,050	\$1,400	851 new PCs were purchased avg = \$902
software	\$1,400	\$25	764 refurb PCs were purchased avg = \$276
unit cost	\$2,450	\$1,425	23 Macs were purchased avg = \$1,855
x 2,037	\$4,990,650	\$2,902,725	

Conclusion: The most objective parts of Ms. Murray’s data, dealing with hardware and software costs, do not reflect MMSD’s purchasing experience or computer pricing structure. (see below)

Technical Services’ response to cost calculations:

- Hardware costs presented by Ms.Murray are in error: Per MMSD’s Intranet site <http://dww.madison.k12.wi.us/purchasing/computers.htm>], Technical Services has the following machines posted as district standard configurations:

Entry pt PC	Dell: Celeron, 1.7 GHz, 256 MB RAM, 20 G HD, 15” monitor	\$689
alt. Entry pt PC	same as above, but w/ 512 MB RAM	\$749
Deluxe PC	Dell: Pentium 4, 2.26 GHz, 512 MB RAM, 40 G HD, read/write CD ROM, 10/100/1,000 NIC, 17” monitor	\$995
Entry pt Mac	Apple G3, 500 MHz, 128 MB RAM, 20 G HD, 15” monitor	\$699
Deluxe Mac	Apple G4, 733 MHz, 256 MB RAM, 40 G HD, 17” monitor	\$1,199

Note:

- Entry point PCs are already more than 2 times the speed, with twice the memory of comparable Macintosh machines [which have to be the deluxe Mac to be comparable], and the Macs cost nearly 75% more; however, to do video editing, some instructional requests have been made to purchase newer eMacs (800 MHz, 256 MB RAM, 60 G HD, 17” monitor) priced at \$1,249, which are significantly under-powered, compared to a Deluxe PC, while still 20% more expensive
- in an effort to stretch limited technology funds over the past 3 years, MMSD has often replaced oldest computers with refurbished PCs, at a cost of ~ \$350 per unit (for 200 to 400 MHz speeds; price has included hardware + MS Suite + 3rd party imaging + delivery on rolling racks)

Conclusion: PCs are significantly less expensive in purchase price than as presented to BOE, and significantly less expensive than comparable Macintosh products.

- Software costs presented by Ms.Murray are in error: A cost comparison of software follows:

	PC	Mac
MS Office Suite Pro (w/ Word, PowerPt, Excel, Access)	\$51.00	upgrds from Off.97/98 no longer available, plus, the Mac office suite can not run Access
AppleWorks: x-platform site lic.purch in 2001 for \$40,000	site lic.	site lic.
FrontPage	\$35.00	n/a
Project 2002	\$39.00	n/a
Quicken	\$33.00	\$54.00
Acrobat	\$55.95	same as PC
PageMaker	\$248.95	same as PC
PhotoShop	\$258.75	same as PC

Illustrator	\$86.95	same as PC
KidPix	\$57.95	same as PC
Kidspiration	\$54.00	same as PC

Since only the professional version of the MS Office Suite is the standard software deployed on most machines, with other products installed only for special administrative or instructional needs, the cost of application software is generally comparable.

Conclusion: The cost of PC software used at MMSD is generally comparable to Macintosh software but some products (such as Access, or client SW described on p.5, #4) are not available on Macs.

3. **Direct technical support costs presented by Ms.Murray are in error:** MMSD's own data contradict Ms. Murray's statement. In F01, when 42% of MMSD's desktop computer inventory was represented by Macintosh computers, requests for Macintosh computers represented 55.6% of all computer work orders performed by Electronic Repair. In F02, when Macs represented 28% of MMSD's inventory, Macs represented 36% of all desktop Work Orders performed by Electronic Repair.

Conclusion: MMSD's own data contradict evidence cited by Ms.Murray. MMSD Micro-Computer Technicians and Specialists agree that managing Macintosh computers within MMSD's computing environment is more challenging and time consuming than managing PCs.

4. **Lost teaching time costs presented by Ms.Murray are in error:** In the past 2 years, 18 of MMSD's schools have been converted from mixed platform sites (both Macintosh and PC computers) to all PC sites [plus, Black Hawk, Chavez, Hamilton, Lapham, Shorewood and Spring Harbor were set up as all PC schools]. The 24 all PC schools are listed below:

Black Hawk		Kennedy Elem.	2001	Sandburg Ele.	2002
Chavez Elem.	2001	Lake View Elem	2002	Sennett Elem.	2002
Elvehjem Elem.	2001	Lapham Elem.		Shorewood El.	
Falk Elem.	2001	Leopold Elem.	2002	Sherman Mid.	2002
Gompers Elem.	2001	Lowell Elem.	2002	Spring Harbor El.	
Hamilton Mid.		Marquette Elem	2002	Stephens Elem.	2002
Hawthorne Elem.	2002	O'Keeffe Mid.	2001	Thoreau Elem.	2002
Huegal Elem.	2002	Randall Elem.	2001	Wright Mid.	2001

Statements from building staff on Mon.17Mar. regarding their technology environment follow:

- ◆ **Huegel:** Teri Hedges (Computer Contact):
 - The PC platform is convenient for all of the staff and students; all support staff, administrative staff, instructional staff and students can use any PC in the building to do their job or assignments; previously they could not because Macs do not have the software needed by all staff
 - More cost effective. PCs can do equal or better.
 - More options for the instructional software.
 - Better selections for peripherals
 - Better to prepare the students for the future. The majority of the companies have PCs. Only very limited specialized fields (Graphic arts) have Mac workstations.
- ◆ **Falk :** Kim Dahl (Library Media Specialist)
 - The programs that are most heavily used by teachers and students--Appleworks, Netscape -- are available in the PC format. Some things that we had only on the PCs, like Word, are already familiar to many, who probably have something compatible on their computers at home. Having the same platform makes it much easier to train and administer. It makes it much easier to work at home and either send documents in an attachment or save them to a disk and bring them to school. In the past, teachers and students would come in with a disk and need help, but not even know what platform they needed! Having two platforms was confusing to many and took up lots of my time when trying to troubleshoot.
 - I think PCs are meeting student and teacher needs as well or better than the Macs did. (I also think that many teachers would benefit from some training in basic word processing and file management, but they would have needed this training no matter whether we had switch to PCs or not!)
 - Students don't have any trouble that I have noticed.
 - I have not heard any negative comments here about switching to one platform. Some teachers were frustrated at first with not knowing how to manage files, and not knowing the details of Word, but those problems were fairly easily solved with a little one-on-one help. More training would be helpful, though, just to keep our teachers up-to-date with current technology. I think our Technical Services must find it much easier to maintain our computers when we're all running from one platform. I think printing is less troublesome now, too.
- ◆ **Thoreau:** Linda Allen (Principal)

- It is much easier for the staff to communicate and use the technology on the same single platform.
- ◆ **Thoreau:** Greg Valle (used to be REACH teacher, now is 4th grade teacher)
 - All of the Thoreau staff wanted to switch from Macs to PCs.
 - The PCs are so easy to use. Some Thoreau staff, who have had very little computer experience, are able to learn with little effort.
- ◆ **Stephens:** Nancy Yoder: (Principal)
 - Referring to the fact that Stephens was migrated to an all PC school last summer: “We had a dual platform so it was hard to teach in a way that was workable for elementary kids.”
- ◆ **Lake View:** Linda Sweeney (Principal)
 - Yes, I’m glad we migrated. The office, special ed, and the custodian were already using PCs ... now everyone is on the same platform, so anyone can go to any machine anywhere in the building and log in and get what they need.
 - PCs are meeting the instructional needs of teachers/students at least as well as the Macs were. It is hard to tell because there are different teachers in the computer lab than when we had Macs.
 - The switch to all PC has met our needs at Lake View. There are no unmet needs.
- ◆ **Marquette:** Jerry Tollefson, (Principal)
 - Yes, I’m glad we migrated. There is much more Internet access than we had with Macs. Email is easier than it was on Macs. We are now using email to communicate with teachers rather than using paper notices. Every Friday our weekly bulletin is distributed electronically.
 - PCs are meeting the instructional needs of students and teachers. Students are making their own PowerPoint presentations in the 5th grade. The teachers have integrated the PCs into their curriculum in ways they never did with the Macs.
 - There is one teacher, a die-hard Mac user, who objected the most to the switch to PC. Because of her strong computer skills, she has transferred her skills and gone further than any other teacher with integrating computers into her curriculum.
- ◆ **O’Keeffe:** Dennis Tande (Computer Teacher)
 - We are glad we migrated to PCs. The learning curve is minimal. Concepts are the same. Students had no problems switching.
 - PCs are definitely meeting the instructional needs of staff and students. Having one platform makes it easier to move about the building and continue with assignments, projects, etc., instead of knowing that if you created it on a Mac you had to find a Mac to continue working on a project. AppleWorks made the transition work well for staff who had a lot of time/lessons invested in ClarisWorks.
 - We chose to migrate because our Macs were old and that way we could upgrade. The curriculum was not affected and in fact things have gone smoothly. A single platform works much better.
- ◆ **Sherman:** Jeff Hattori (Computer Teacher)
 - I am so happy we migrated. Students at Sherman are now better able to move about with their work. Most computers at community centers, computers at home and public libraries are PCs. These students are now able to do work outside of school and then they can then bring work to school and continue work. They were unable to do this when they had Macs in the lab.
 - A single platform has made a big difference at Sherman. Anyone, staff or students, can move around the building to do their work. They can also do work at home where 95% of staff have PCs.
 - The migration has made life easier for students at Sherman. A single platform that conforms with the outside world is important.
- ◆ **Leopold:** Mary Hyde (Principal)
 - Yes, we are glad we migrated to an all PC school. It’s economically better for district; many staff have PCs at home and students will more likely have almost no transition when they go to middle school
 - We have adjusted some of our instructional units in technology to accommodate PCs but it has gone very smoothly. Our Reach teacher has done a super job. She has made all the difference for us. In addition, we have used district training staff and a Reach teacher to train teachers. On our recent staff day we had a very well attended session on KP3.
 - I have appreciated the support provided. My main concern was completing the migration this year! Thank you for your help!

Conclusion: It is not credible that MMSD principals and teachers who have migrated to all PC buildings would make these statements, if they felt teaching time was lost using PCs.

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| <ol style="list-style-type: none"> 5. File management costs 6. Learning OS 7. Staff training | It is reasonable to consider all 3 of these issues, as a cluster, relating to a person’s ability to master basics of a desktop computing environment. Since it is reasonable to conclude that employees mastering a desktop computing |
|---|---|

environment would be critical to any business' efficiency, it is reasonable to conclude that any business such as a Fortune 500 company, would choose a desktop environment easiest for employees to master. If Macintosh computers were significantly easier to use, so much more efficient and ultimately lowered the Total Cost of Ownership (TCO), Apple would own a dominant market share. As the graph to the right shows (data available from

http://www.pegasus3d.com/total_share.html) this is not only not case, but Apple has lost market share from their peak of 12% in 1992, to their lowest point (since 1984), of 2.27% in 2002.

Note: Regarding PC training requested at 11 of the 18 schools which were migrated to all PC in the last 2 years: a total of 64.75 hrs of training (avg.5.8 hrs / school) was provided (by Tina Krouth, the computer teacher at Whitehorse Middle School) at the request of building staff. Training covered an introduction to

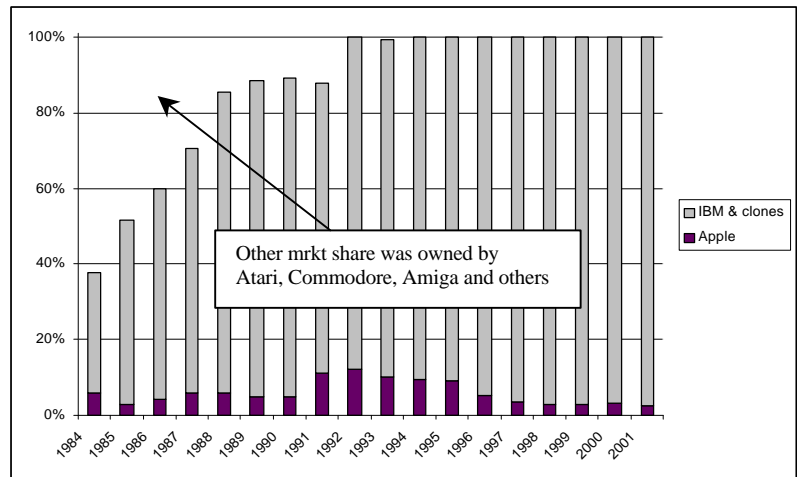
the new operating system features, how to login to the network, and an introduction to basic file management on the network. Many Macintosh users had no previous experience saving files to a file server (since they had previously only saved files to their local hard drives). Offers were made by Tina Krouth and Technical Services staff for any additional training to insure users were comfortable with the Windows environment and no additional training requests were made at these schools.

Conclusion: If Macintosh computers were easier to understand and use, companies would save money by using them and Macintosh computers would dominate the marketplace. Rather, over the last decade, Apple has shown a dramatic loss of market share. Where schools within MMSD have been migrated to an all PC environment, training in the Windows operating system and basic file management has averaged less than 6 hours total, per building.

8. **Indirect trouble-shooting costs presented by Ms.Murray are questionable:** By Gartner definitions, "indirect trouble-shooting" costs are referred to as "shadow support." Shadow support is the calculated cost of end-users seeking technical support from peers who are not normally trained in technology and who are paid to perform other functions. Indeed, this area of technical support is one Gartner recommends being sensitive to, because as end-users rely more on shadow support, shadow support providers become correspondingly less productive performing what they are paid to do. The TCO study done in MMSD in the spring of 2001 did not differentiate between shadow support required for Macintosh vs PC users. It did, however, conclude that within MMSD, shadow support is higher than expected and negatively impacts teaching and prep time. (see conclusion #11, slide 20 of PowerPoint presentation given to the Management Team on 27Apr.2001: <http://www.madison.k12.wi.us/ts/tco.ppt>)

Conclusion: MMSD has no evidence differentiating costs of shadow support for Macintosh vs. PC desktop computers, however, MMSD evidence does indicate teaching time with students suffers from peer support for technology.

% Market Share: Apple vs IBM clones: 1984-2002



Technical Services' response to supporting citations:

Citations used to support conclusions presented to the BOE included the following:

- A. **TCO study performed by MMSD:** spring 2001: MMSD's Technical Services Director was the MMSD Project Leader for this study, which was coordinated by an outside vendor, following Gartner Group guidelines; results were presented to the Management Team on 27Apr.2001; this study drew several conclusions including:
- MMSD is under spending on technology #6 (slide 17)
 - shadow support (= peer technical support by staff not trained to provide technical support) is higher than expected and negatively impacts teaching and prep time #11 (slide 20)
 - end-user training is 52% lower than expected #13 (slide 24) [Note: this was when Technical Services had a productivity tools trainer, a position held vacant for the last 2 years to save money]

- multiple hardware and operating system platforms increase technical support staffing requirements and places greater strain on already lean technical staff #15 (slide 24)
- B. Gartner Group's Web sites cited by Ms. Murray: both <http://www4.gartner.com/init> and <http://www.gartner.com/public/static/consulting/tco/tcobb.html> are sites that are not available ("The requested object does not exist on this server. The link you followed is either outdated, inaccurate, or the server has been instructed not to let you have it.")
 - C. Urbana School District's, Platform Cost Study site: <http://www.cmi.k12.il.us/Urbana/ymac.htm> contends that the district technology plan "specifies purchasing Macintosh for the classrooms because it is the base the Urbana School District already has installed in the elementary and middle schools. The High School will be given more freedom on which platform the individual teachers prefer." This Web site further states that, "Gartner Group estimates that even elementary measures such as hardware and software standardization and remote management of desktops and servers can cut overall desktop costs by 25%." This article goes on to state (in red and with capitalization, for emphasis), "The SKILLS necessary to be productive in the information society are universal regardless of the platform."
 - D. International Data Corp Web site: <http://www.idc.com/> : this cited URL is the home page of IDC but does not provide any relevant information to the topic presented by Ms. Murray
 - E. Queues Enforth Development, Inc Web site: <http://www.qed.com/> : this cited URL is the home page of Q.E.D. CAD/RMS Public Safety Software but does not provide any relevant information to the topic presented by Ms. Murray
 - F. The CA K-12 schools Web site: http://www.library.ca.gov/crb/99/in_association/01/ia99001.pdf (is a 76 pg document, written over 4 years ago for the 1999-2000 school year) suggests that schools within a district be directly responsible for their prorated portion of the district's technology budget and bare their own costs of support; In MMSDs case, this would require a disaggregation of technology infrastructure and support costs, when so many services currently in MMSD are being standardized, consistent with Gartner Group guidelines for Best Practices.
 - G. Gistics ROI Techbrief: this was published 6 years ago, which makes any technical information or assessments significantly out-of-date
 - H. Due to time limits, did not check all other citations

Additional Technical Services' staff observations:

1. None of MMSDs GUI AS400 applications work on Macintosh computers; these applications currently serve over 1,000 MMSD staff, including teachers, psychologists, social workers, and administrators responsible for managing and reporting on student data (Note: as of fall 2003, this will include all elementary teachers who will be completing on-line report cards to help the district meet NCLB Act requirements).
2. Macs can not use ZenWorks (which allows remote software deployment on PCs). Therefore, on Macs, software must be installed locally rather than remotely or via automated install at next network login
3. Software products that are dual platform are designed to have the same look and feel on either Macs or PCs to make it easy for end-users to use products on either platform. However, installation and configuration often require unique, operating system specific installation steps [this is not simply a difference between Mac and PC but often requires configurations unique to Mac System 7, 8, 9 or X, as well as Win.98, NT or 2000]; therefore technical support skills for trouble-shooting become broader and are more expensive to maintain when we service more versions of desktop operating systems.
4. Many software products currently widely used in MMSD can not run on the Macintosh platform: e.g.: no client software is available for GroupWise, AS400 applications or OneUp for data warehouse access.
5. Currently, for server and desktop anti-virus protection, MMSD uses Command FProt (anti-virus software), version 4.75.x. This product works on Novell servers, all Windows operating system versions and Linux boxes. (It does not work on any Apple products.) Technical Services is auto-notified of FProt updates (at least weekly). Updates are auto-downloaded from the vendor and auto-deployed to all Novell servers and then auto-updated to all PC desktops at next login. For Apple computers, we have a mix of ShareWare anti-virus software products that require hands-on local installs by micro-computer technicians.
6. Microtech technicians hired in the past few years must be trained, after being hired, to work with Macs, as skills brought to the job tend to focus on certifications with Intel platform machines and Novell networks.
7. Currently, 13 MicroTechnicians service 8,600 computers, a ratio of 1:662. The industry standard is ~1:250.