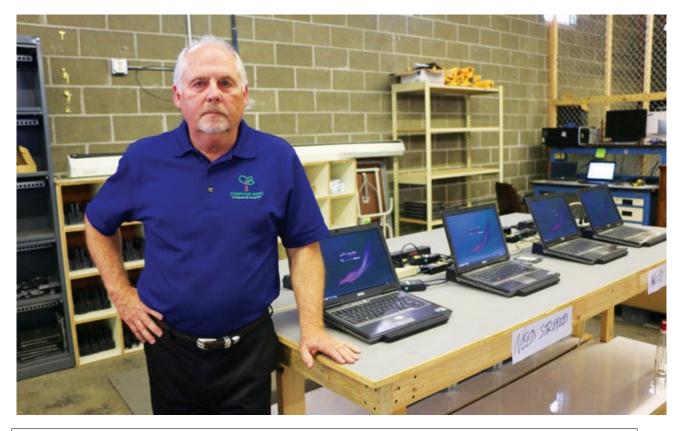Thursday, Aug. 20, 2015 12:01 am

New operating system

Nonprofit gets a new operating system

By [Bruce Rushton](#)

David Fowler, executive director of Computer Banc, says a new type of laptop developed by his agency could help school districts cut computer costs. Meanwhile, donations of surplus computers (inset) pour in.

Photo by BRUCE RUSHTON

When Computer Banc first moved into its new headquarters on East Groth Street last spring, the 12,000-square-foot facility, formerly used by United Cerebal Palsy as a sheltered workshop, seemed huge.

No longer.

Now, the charity that recycles and refurbishes computers is storing donated computer gear in trailers that haul as much as 13,000 pounds of unusable digital scrap at a time to a Granite City recycling center. Workers, many of them sent to Computer Banc by the Springfield Urban League and Capital Township, tear apart the innards of desktops to salvage what can be used again. More than 1,000 refurbished laptops and desktops, once considered obsolete, are sent out each year to schools, seniors, nonprofit agencies and other deserving recipients.

It's a long way from the basement of First Presbyterian Church, where Computer Banc was launched in 1999. Just six years ago, Computer Banc, out of money and lacking computers, shut down for two weeks. David Fowler, the agency's executive director, now works full time at Computer Banc, a step up from the part-time hours he once worked. He is one of four full-time employees who work alongside two part-time employees. The agency, which ran a deficit just a few years ago, now has an annual budget of $320,000, Fowler says.

 "When I came here six years ago, we had a $48,000 budget," Fowler says. "We've gone from 120 computers a year to 120 per month."

Fowler credits corporations for the turnaround. Computer Banc once relied on individuals to donate computers. Now, the charity relies on big business to donate devices en masse and sees opportunity where others see problems.

The demise of Windows XP, for instance, might have been a headache for a lot of us, but it was a blessing for Computer Banc as corporations got new computers instead of swapping out operating systems in devices that were nearing the end of their useable lives in terms of depreciation. Computer Banc simply replaced Windows XP, the digital equivalent of a buggy whip, with current software, and computers that had been considered junk were useful again.

"Memorial (Medical Center) has 2,500 computers in their system," Fowler says. "You can bet, on any given day, close to 2,000 of them are identical – the big corporations all work that way. Switching from XP to Windows 7, we would get, literally, hundreds of identical computers. … The quality of what we're offering consumers is much higher. A lot of these computers are only three or three-and-a-half years old, just off lease in most cases."

What was once a Springfield-centric collection strategy has now stretched throughout central Illinois, with companies as far away as Jacksonville and Bloomington donating computers to Computer Banc, which has widened its distribution strategy. In the old days, the charity concentrated on providing low-cost computers to low-income families. Now, Computer Banc also provides computers to schools,

nonprofit agencies, veterans, low-income college students, adults with special needs and military personnel and their families. And the agency aims to get even bigger.

Photo by BRUCE RUSHTON

Look out, Microsoft

For years, Computer Banc, by necessity, swore by PCs.

Unlike Microsoft, Apple doesn't have reduced software licensing fees for nonprofits that provide low-cost computers to the poor. Without access to low-cost operating systems, Computer Banc couldn't exist, given that a legally licensed Windows operating system typically costs at least $100.

"Other than being altruistic, they're (Microsoft is) trying to keep the Linuxes of the world at bay," says Bob Pietras, a retired Horace Mann IT manager who once served on Computer Banc's board and remains a volunteer at the agency.

The online operating system called Linux is free, an f-word that software companies dread. Android smartphones and some netbooks operate on Linux, but it has, historically, been fairly rare in the world

of consumer computers – fewer than 2 percent of the planet's desktop computers run on Linux.

Then came Google.

In 2010, Google debuted the Chromebook, a super-cheap, super-light, super-easy-to-use laptop intended to revolutionize the world of portable computers. Dubbed Cr-48, the first Chromebook was never offered for sale. Rather, Google in a pilot program distributed 60,000 free ones to participants who signed up online and were warned not to expect miracles from the machine that ran on a Linux-based operating system called Chromium.

"The pilot program is not for the faint of heart," the company told applicants who promised to tell the company what they liked and didn't like about the new devices. "Things might not always work just right."

Things worked wonderfully. Within six months of Google's rollout, Samsung introduced its own Chromebook. Acer, Lenovo, Dell, Hewlett Packard and other companies weren't far behind.

Unlike a PC, which relies on a hard drive to store information internally, a Chromebook uses remote servers to store data in the so-called Internet cloud. A Chromebook is, essentially, a portable browser with a keyboard that relies on a free operating system rather than one that costs money. With the same amount of data storage as on a typical smartphone, a Chromebook starts up in seconds, typically weighs less than three pounds and sells for as little as $150.

Without the Internet, a Chromebook is near useless. But they're ideal for folks who don't need a computer for much more than surfing the Internet, sending email and poking around Facebook. And they have taken the nation's education system by storm.

Colin Carden, foreground, and Charlina Thomas salvage useable parts from donated computers.

Photo by BRUCE RUSHTON

Computer Banc goes chrome

Computers in schools have proven both godsends and disasters.

Los Angeles, where taxpayers have spent $1.3 billion to provide every teacher and student with an iPad, has seen one of the biggest debacles. Equipped with specialized software, the iPads, which cost $968 apiece, didn't work as billed, with students able to easily bypass security filters designed to keep them focused on their studies while software glitches made it impossible to access curriculums. The FBI raided Los Angeles Unified School District offices last year as part of an investigation into suspected bidding improprieties, and the district has notified both Apple and the curriculum software provider that it will seek millions of dollars in refunds.

While Los Angeles' experiment with iPads imploded, Chromebooks in the third quarter of last year outsold Apple in the U.S. education market, with Google shipping 715,000 of the devices to schools

compared with 702,000 iPads, according to Financial Times. Suddenly, what seemed like a solid grip by Apple on the educational market for computers wasn't such a sure thing. The trend has not gone unnoticed in the Springfield area.

Starting in the 2013-14 school year, the Rochester School District has issued a Chromebook to every student in grades 4 through 12. Families pay $75 per year for each computer and own the devices after three years. Students eligible for free lunches can use loaner computers free of charge. Only Chromebooks are allowed in classrooms – the district says that all training is geared toward Chromebooks and that use of other devices will consume precious bandwidth.

There have been no FBI investigations or demands that Chromebook vendors refund money in Rochester. Thomas Bertrand, superintendent of the Rochester School District, says that the technology is working well, and he predicts that demand for computers in schools will only grow.
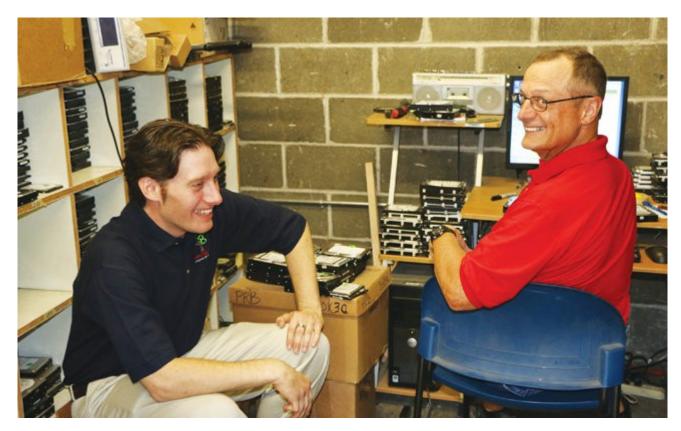
"We're all about career readiness and college readiness," Bertrand says. "Every kid gets a computer. I'm not sure that people would appreciate it if we tried to go back."

It's that kind of thinking that grabbed the attention of Computer Banc, which had never strayed from PCs and Windows.

"Six months ago, we decided, 'If you can't beat 'em, join 'em,'" Fowler says.

So began an effort to convert castoff PC laptops into Chromebooks.

While Chromebooks are thin, light and available in all sorts of colors, Computer Banc chose the tried-and-true Dell Latitude D620 to become what Fowler and his colleagues call the cbook – the "C," they say, stands for "cloud," not "chrome."

Joshua Hawkes, left, who developed the cbook's operating system, takes a break with Bob Pietras, a Computer Banc volunteer.

Photo by BRUCE RUSHTON

Once the darling of corporate America that needed laptops en masse to distribute to employees, a black-and-grey Dell Latitude D620 is not anyone's idea of sexy. An optional extended-life battery plugs into the outside and hangs off the unit below the keyboard, like some sort of electronic tumor. Even when they debuted nine years ago, with an MSRP of nearly $900, they weren't considered elegant. In a 2006 review, notebookreview.com described the appearance as "an industrial and muscular look."

"The industrial looking aesthetics are true to the actual build of this business laptop," the reviewer wrote. "The D620 is very sturdy. It uses an all magnesium-alloy case. This results in strong overall physical protection of the notebook, worry-free of case cracks appearing or problems with excessive flexing. The hinges are constructed of steel. Dell claims they have been tested for up to 20,000 cycles (openings and closings) to assure freedom from loosening and wobble."

In short, Fowler and his cohorts figured, the perfect beast to withstand punishment only a sixth-grader can deliver, and they are quick to point out that Chromebooks used by school districts are often made from plastic. Districts also tend to use Chromebooks with 11-inch screens. A Dell has a 14-inch screen.

"Which would you rather look at all day?" Pietras asks.

Corporations snapped them up, and Dell D620s have become cheap and easy to find now that they've been surplused. They sell for as little as $35 apiece online.

"If I had the funds in my pocketbook, I guarantee I could buy 10,000 in 90 days," Fowler says.

Parts are also ubiquitous. And a Dell D620 is simple to fix if something goes wrong. Joshua Hawkes, lead technician, boasts that he can completely disassemble one with a flathead screwdriver and a Phillips screwdriver.

"Put it this way: I was in management for 20 years," Pietras says. "Even I can take one of these things apart."

Inventing software

Once a computer was chosen to become Computer Banc's version of Chromebook, the next step was creating an operating system to mimic the Google-designed system used on bona fide Chromebooks. The task fell to Hawkes.
"First off, the term 'hacker' is a bit of a misnomer," Hawkes said.

Hawkes, in fact, didn't do anything illegal. Linux, the open-source software on which the Chromium operating system is based, comes with a significant string attached.

"If anybody asks 'How did you do this?' you have to provide code," Hawkes says.

With the inner workings of Chromium available for anyone to see online, Hawkes figured out how to clone Chromium so that a cbook would work exactly the same as a Chromebook. Converting PCs to Chromebooks had been done before – as long ago as 2011, software geeks were posting how-to instructions on the Internet. But Computer Banc developed a way to do it on a scale that makes it possible to produce large numbers of devices at a low cost.

"No one out there has offered to take on any kind of mass production, even a small mass production like ours, where you're selling the hardware and the software as a package," Fowler says. "No one in the country, except for Computer Banc, has been able to do this. Here in your little backyard of Springfield, you've got a nonprofit that's doing something revolutionary."

In addition to developing a copycat of Chromium, Computer Banc says that it has also made it virtually impossible to remove, alter or replace a cbook's operating system, an important factor for school officials and parents who want to make sure that everyone uses the same operating system and that security devices work. Similarly, USB functions and DVD players on the Dells have been rendered inoperable to mimic true Chromebooks, which have no such functions.

There is a way to turn a cbook into a PC again, but Hawkes is confident that kids won't be able to figure it out, nor will they be able to disable security functions the way that students in Los Angeles were able to bypass security functions on iPads designed to keep the darker reaches of the Internet off limits.

"Nothing's bulletproof – anything can be hacked," Hawkes says. "But you have to have experience to know how to do that. We have a lot of experience figuring out how to prevent that. We don't make it easy."

The cbook has inspired a new way of thinking at Computer Banc, which has divided its production floor in half, one side for PCs, the other for cbooks. Fowler dreams of the day that he'll be purchasing Dell laptops in bulk to meet demand for cbooks instead of relying on donations. But first, Computer Banc needs customers.

Making the sale

Stockpiling cbooks and waiting for customers isn't practical for an organization the size of Computer Banc, which perfected the cbook last spring and has so far produced only a handful.

"We need purchase orders," says Fowler, who figures Computer Banc could produce 1,000 or so cbooks in relatively short order. "The schools need to, at least, seriously look at what we're doing. If they're going to make a major purchase, why wouldn't they test our computers? … I'm not saying Chromebooks are bad. But there is an alternative. These guys can save money."

Fowler made his pitch last April at a regular meeting of area school superintendents organized by the Sangamon-Menard Regional Office of Education. It was, Fowler recalls, a promising start.

"One of the superintendents looked at me and said out loud, 'Sold,'" Fowler recalls.

But, aside from the regional superintendent's office, which has ordered 17 cbooks for students who

have been suspended or expelled and attend special classes at Capital Area Career Center, no school system has, so far, ordered a cbook.

Jeff Vose, regional superintendent, said that low cost was behind his decision to buy cbooks. The regional office got a reduced price and is scheduled to receive 17 cbooks and five desktop computers for $2,000.

"It's a cost-effective way to provide laptops or computers to students and to districts versus a traditional way of getting a bid from a large contractor," Vose said.

Vose said his only concern is service and response time in the event a computer breaks.

"If they can do those two things, I'm pretty confident we've made the right decision," Vose said.

If a cbook breaks for any reason within two years, Computer Banc will replace it for $45. If the cause is a defective part or workmanship, repair or replacement is free. That's a lot less than most three-year Chromebook warranties that typically cost about $100 and may never be used, Fowler says. A cbook equipped with a new battery, hard drive and charging cord costs $148, and if it doesn't break, a district pays nothing further. The cheapest Chromebook costs about $150, plus the cost of an extended warranty, plus a $30 fee to register the device with Google, Fowler says.

On the other hand, a cbook weighs more than 5½ pounds, nearly twice the weight of a Chromebook. Battery life is mediocre, with the battery on a cbook tested by Illinois Times lasting four hours, half the time that a typical Chromebook will run on battery power.

For Vose, such issues aren't major, given that cbooks won't be going home with kids or straying far from electrical outlets. But it can be an issue for districts that want computers that kids can tuck under their arms and take between classes before toting them home.

"The hardest thing in the middle of the day is to find a charging station," says Jennifer Gill, superintendent of Springfield School District 186. "The heaviness, I think, is a factor."

Fowler has no illusions. There are 11,000 students enrolled in Springfield schools, and there is no way that Computer Banc could produce enough cbooks for all of them. But he says that Computer Banc could be part of the solution for the district that is now considering computer options for students and staff.

"We can't save you money on all of your computers, but we can save you money on some of your computers," Fowler says.

The district in 2014 dramatically cut computer expenses due to budget concerns, opting not to renew a deal with Apple, which had supplied the district with 6,000 computers, upgrades and maintenance at an annual cost of nearly $2 million. But computer purchases are expected to pick up again. The district has experimented with Chromebooks, distributing eight different types to students in fifth grade to high school in a pilot project to see which brands work best.

Gill praises the affordability of Chromebooks, and she isn't ruling out Computer Banc. What's best for students, she emphasized, has to be the priority.

"It certainly isn't anything we want to shut the door on," says Gill, who met with Fowler for an hour last week to talk about cbooks.

Other superintendents, however, are wary about large computer purchases.

In the Williamsville School District, students have access to computers, but there are not enough for everyone. During last year's state-mandated standardized testing that required computers, every available unit was used for tests, leaving no computers available for classroom instruction, said David Root, superintendent of Williamsville schools.

"It was almost two months where teachers who wanted to use computers, they couldn't because the computers were being used for the (standardized tests) the state has imposed on us," Root said.

Root is a fan of Computer Banc and has acquired computers from the charity in the past. But he's not certain that spending money to provide every student with a laptop is a wise use of resources for cash-strapped school districts. He also says that computers have to be used wisely. It's not enough for students to know how to use a computer to find the answer to a question, he says. Rather, they must know how to find the answer without a computer. Root says that he would never choose a machine over a teacher.

"Nothing will replace one-to-one instruction with your students – human contact is a priority," he says.

*Contact Bruce Rushton at **brushton@illinoistimes.com**.*