

HP's Adaptive Enterprise helps Punahou School customize its connection with students – inspiring them to new educational heights

change + hp

“With the use of technology, students are able to gain a deeper knowledge and understanding of concepts through instant responses and more personalized feedback from faculty. Thanks to our HP Adaptive Enterprise, Punahou’s educators and its IT infrastructure are synchronized to capitalize on change and leverage new technologies for student and community benefit.”

– Eric Brown, Chief Information Officer
Punahou School



Solutions for the Adaptive Enterprise.



The HP Adaptive Enterprise infrastructure has allowed faculty to embed technology into core curricula, enabling students to connect with teachers, one-to-one in new and innovative ways, resulting in deeper levels of learning.

Punahou School in Honolulu, Hawaii, was founded in 1841 with a goal of providing quality education to the children of Congregational missionaries, enabling them to stay in Hawaii with their families instead of being sent away for schooling. Today, this coeducational college preparatory day school enrolls 3,700 students, and while now non-sectarian, has retained much of its rich heritage. Testament to Punahou School's success, there are currently over 45,000 alumni, of whom 45 percent still live on the Hawaiian Islands and like to remain in contact with the School.

The focus on providing a quality education remains foremost in the School's mission: "To develop the intellectual, academic and physical potential of each student to the fullest degree, preparing them for college and for challenges facing them now and in the future."

The vision of the School's Chief Information Officer, Eric Brown – combined with support from HP – has brought about the deployment of a truly industrial-level Adaptive Enterprise IT infrastructure, facilitating widespread communication between students, faculty, staff, parents and alumni. Even more importantly, it has permitted faculty to embed technology into core curricula, which enables students to connect with teachers, one-to-one in new and innovative ways, resulting in deeper levels of learning.

Greater communication goals

The School was extremely fortunate to receive a \$4 million donation from one of its alumni, who had been very successful in the computer industry. The donor recommended the funds be used to develop an Internet portal to enable communication among the 50,000+ Punahou School community members.

Brown elaborated, "Punahou School wanted to bring everybody closer together and enable more direct communication, but as every action performed at the School must be in support of the mission statement,

a clear linkage between new technology and student learning needed to be forged. The School Board created the position of Chief Information Officer, and I was hired for my expertise with start-up companies and ability to create, and sustain new and sound IT infrastructures."

One of Brown's first actions was to evaluate the legacy technology, which was primarily Apple Macintosh-based equipment. Upon surveying the parent community, it was evident that the majority of homes had access to Microsoft Windows®-based PCs, making it clear that achieving greater alignment between the families and School environments was critical.

He recalled, "For us to successfully implement a portal, I had to take a step back and assess the infrastructure – technology, organization, governance. The Technology Department had traditionally been operating as a help desk, and because of the requirements of global access via a portal, it needed to evolve to support a 24x7 server environment with industrial-strength processes and procedures."

In looking at the different needs of the Punahou constituents – students, faculty, staff, parents and alumni – Brown recognized that the success of embedding technology in the curricula hinged on effective education of the faculty. "It was critical that faculty be shown how to incorporate and leverage technology into their classes," he noted.

A foundation framework for success

Before engaging in a search for a technological solution, Brown developed a framework to demonstrate the positive effect on student education that could be achieved by spending money on IT. The framework positioned an IT infrastructure at the bottom of a pyramid, and developed clear linkages up to faculty, then to students and curriculum, and finally to the mission statement supporting the goal of fully developing students. For the Board of Trustees and the faculty, this visualization of the connection was an extremely powerful demonstration that the proposed IT

infrastructure would meet the needs and be in support of the school's mission.

Brown remembered, "When I presented the framework to the board, I also had a teacher show how she would use a Tablet PC within her English class. As she logged on, I highlighted the security software, then the wireless network, and next the Internet gateway. She illustrated how the Tablet PC's flexibility – with handwriting, keyboard and voice inputs – helps meet the different

The focus on providing a quality education remains foremost in the School's mission: "To develop the intellectual, academic and physical potential of each student to the fullest degree, preparing them for college and for challenges facing them now and in the future."

learning styles of students, and I was able to connect the technology level in the framework to elements higher up, eventually leading all the way to the mission. By the time we were done, the School's Board fully comprehended how the IT infrastructure would support the mission and improve student learning."

Another critical success factor for the IT infrastructure was to address the issue of professional development. Brown elaborated, "Excellent teachers with good experience can be hired, but the School must offer training and support to keep them performing at peak levels and staying on top of new technologies that can be leveraged in the classroom. The faculty liked the framework because it clearly showed the IT department in support of professional development."

Selecting Adaptive Enterprise components

Having established comprehensive School Board and faculty support for the framework, Brown turned to evaluating infrastructure technologies. He commented, "We knew the portal would need to handle a capacity of 50,000+ people trying to access it. In addition, we wanted a server environment that would allow us to scale to meet changing community needs. After looking at different solutions, we purchased 26 HP ProLiant rack-mounted DL Series servers for Microsoft Windows-based file and print tasks, web, student information and Human Resources (HR) applications. We selected HP's servers primarily because the local support and service are superior to other vendors."

Brown's Chief Architect, David Parrish, assessed the data storage requirements and recommended deployment of a Fibre Channel-connected storage area network (SAN) based on an HP StorageWorks Enterprise Virtual Array. "He specifically selected the HP StorageWorks EVA3000, which interfaced seamlessly with the HP ProLiant servers," said Brown.

With regard to the client layer of the infrastructure, Brown chose the HP Compaq Desktop PCs for their durability and availability of support and is integrating them into the School from the sixth grade upwards. "Obviously with HP's reputation for excellent printers, it was a given that we'd select the HP LaserJets printers – they just don't break," Brown enthused. "We even loved the quality and clarity of HP MP3130 Projectors, so we installed them too!"

For a campus-wide wireless network, Brown evaluated Cisco, HP and Foundry, and opted for the HP ProCurve Wireless Access technology. He said, "We chose HP because its architecture is leading-edge."

While Brown and his team evaluated each component of the infrastructure individually, the results kept leading to HP solutions. Brown commented, "I didn't set out to partner specifically with HP at every level of the infrastructure. We have ended up doing so because of its impressive portfolio of solutions backed by excellent support services. HP delivers simplicity, agility and value with its Adaptive Enterprise philosophy and IT infrastructure elements."

Playing in a technology sandbox

Punahou School wants to be on the leading edge of technology. To support this objective, Brown has created two test environments – known as 'sand boxes' – to encourage vendors to allow the School to test new products within the rigor of an educational environment, and have students and staff report back on the performance of the devices.

Brown recalled, "Last year, one of our English teachers wanted to use Tablet PCs in her summer program to evaluate the positive impact they might have. We invited six vendors – HP, NEC, ViewSonic, Fujitsu, Toshiba and Acer – to donate Tablet PCs to our sandbox so that we could assess them via this summer program. The students were asked to try all of the different devices and report back on which ones were more helpful and why. Our goal was to assess how students might learn more efficiently from using these devices – via handwriting recognition, voice recording, etc."

The HP Tablet TC1100 PC uses the Microsoft Windows XP Tablet PC Edition operating system, and users have a stylus to enter text and drawings directly on the screen. That input can then be saved in either text or handwriting formats, and edited or repurposed later.

"The durability of the HP Tablet PC was better, in part due to the hard surface of the screen. The size and pressure sensitivity of the screen also proved easier for the kids to use. It didn't run too hot and the weight was acceptable. Best of all, the kids couldn't lose the stylus! We purchased 200 HP Tablet TC1100 PCs to pilot on a larger scale across the sixth grade during this school year."

The framework comes to life

The HP Tablet PCs are already facilitating different styles of learning – helping with the organization and storing

At a glance

- **Organization:** Punahou School
- **Location:** Honolulu, Hawaii
- **Founded:** 1841
- **Telephone:** 808-944-5711
- **URL:** www.punahou.edu
- **Primary focus:** A coeducational college preparatory day school, reflecting Hawaii's ethnic, cultural and socioeconomic diversity, for students in kindergarten through grade 12.

of hand-written notes, allowing the input modality of choice via voice, typing, speech recognition, handwriting or drawing, and annotation of work via inked or voice notes. Brown said, "This is a technology that the kids embrace immediately. Some kids with learning differences used the voice recognition input, and this helps them stay involved in the classroom activities."

The portal enables students and teachers alike to gain access to work placed on the server for pick-up. School resources are available to the community via the portal, facilitating an even greater connection with the school and learning beyond the standard school hours. Brown has not forgotten the commitment to professional development, and his staff offers a wide range of courses for the teachers.

Leveraging the personal touch

"With teachers now able to annotate student work with voice-based comments, and children able to replay them as much as they wish at times that are convenient for them, the process of learning feels much closer to private one-on-one tutoring," noted Brown. "Inspired by the personal comments, we are seeing kids work harder on their edits. And as it is faster for faculty to make the voice notes versus writing comments, this modality is a win-win

situation, bringing students and teachers closer together and learning more individualized."

Already the underlying technology infrastructure is delivering the agility Brown desired. He explained, "The School is currently constructing a new \$61 million facility for the sixth, seventh and eighth grades. Designed explicitly to meet the learning and developmental needs of this unique age group, the new Case Middle School promises to deliver unparalleled opportunities for learning, growth and discovery. Having constructed our IT environment based on HP Adaptive Enterprise principles – using standard technologies and interfaces, adopting common architectures and implementing standard processes – we are exploiting its ability to adapt to our changing needs."

He concluded, "The more leading-edge the technology, the more the kids will engage with it because 'it's cool.' They don't even realize they're learning! With the use of technology, students attain deeper knowledge more quickly, and receive instant response and personalized feedback, which are essential for increased learning. Thanks to our HP Adaptive Enterprise, Punahou's educators and its IT infrastructure are synchronized to capitalize on change and leverage new technologies for student and community benefit."

Challenges

- Enable more direct communication between students, staff, faculty, parents and alumni.
- Support of curriculum through the use of technology.
- Continue to support the mission statement.

Solution

- A K-12 education portal to scale for 50,000+ people:
 - 14 HP ProLiant rack-mounted DL Series servers for web servers
 - HP StorageWorks Enterprise Virtual Array disk array (EVA3000) and Fibre Channel connected storage area network
- Framework for IT infrastructure – demonstrating support for teaching, learning and school mission encompassing:
 - 440 HP Compaq Desktop PCs
 - 200 HP Tablet TC1100 PCs
 - HP ProCurve Wireless Access network
 - 14 HP ProLiant rack-mounted DL Series and four NetServer LP2000R servers for file and print, student information and Human Resources applications
 - 110 HP LaserJet 2000 Series and 4000 series model printers
 - One HP MP3130 Projector
- Professional development

Results

- School resources are available to the community via the portal – enabling an even greater connection with the school and learning beyond the standard school hours.
- A wide range of learning modalities is available to students, helping them learn as optimally as possible.
- Teachers receive a broad range of professional development training, encouraging the support of curriculum through the use of technology.
- The School's mission statement is supported and fueled by the HP Adaptive Enterprise.

For more information on how working with HP can benefit you, contact your local HP sales representative, or visit us through the Internet at our world wide web address: <http://www.hp.com>

© Copyright 2004 Hewlett-Packard Development Company, L.P. The information contained herein is subject to change without notice. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.