San Jose State University students learn mobile computing first-hand with HP

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— Malu Roldan, Assistant Professor, Management Information Systems, San Jose State University

San José State
UNIVERSITY

Carnegie Mellon

Solutions for the Adaptive Enterprise.

hp
invent

San Jose State University wanted to explore ways in which it could more closely engage with the local community and businesses to expand their students' learning opportunities

Located in the heart of Silicon Valley, San Jose State University (SJSU) is known for its cutting-edge programs, award-winning faculty, and private sector collaborations. Above all, it is committed to educating its students to compete in, and contribute to, today's increasingly complex global economy.

Given its unique stature in what is considered "the high tech capital of the world," it is not surprising that SJSU has a strong focus on technology.

"We really want to equip our students with the skills they will need in today's and tomorrow's business world," commented Malu Roldan, Assistant Professor, Management Information Systems at SJSU. "Our students need to be capable of working with technology in a business setting and working in teams, across functions, to apply technology to solve business problems."

Help from HP
According to Roldan, "In 2002, SJSU started to explore ways in which it could more closely engage with the local community and businesses to expand our students' learning opportunities. We wanted to explore how mobile computing could facilitate the breaking down of barriers to collaboration within campus and with the general community, and how that might impact education."

Community involvement has been a mainstay of HP's corporate objectives since the company was founded in 1939. The objectives of HP's Applied Mobile Technology Solutions in Learning Environments grant initiative was a perfect match with SJSU's goals. This initiative was designed to influence teaching and the learning experience of students on campus through the innovative application of mobile technology. SJSU received its first grant from HP in 2003.

Building mobile computing solutions
Roldan described SJSU's program involving mobile computing, "We put students into cross-disciplinary teams and pair them with community contacts in an entrepreneurial style. They are assigned to build mobile computing solutions to meet the different needs of their community partners. Then, the students develop business cases for those mobile computing designs. The community partners evaluate the value of the mobility solutions, and many seriously explore the students' proposals for their viability and potential in their organizations," she explained.

One student team, partnered with the San Jose Convention Center, was assigned the task of developing a solution to support convention attendees needing immediate access to presentation materials. By studying how mobile technology could be ported to the convention center, the students developed a prototype mobile solution.

Roldan commented, "Fundamentally, we are looking at how mobility solutions can be deployed to make everyday processes more efficient and easier to execute and distribute across individuals and settings. We also want the students to consider both the social and economic impacts of some of these projects."

Adaptive books enhance mobility
An integral component of the mobile computing solutions involved the use of electronic book software developed by TextCentric, Inc (www.textcentic.com) with a research base at Carnegie Mellon University (CMU.) The creator of the Adaptive Book project, Ananda D. Gunawardena, an Associate Teaching Professor of Computer Science at CMU and a textbook author, started to look for ways to make books more useful. He explained, "I separated my books into chunks – paragraphs and graphics were indexed, allowing them to be manipulated independently.

"Once users have access to the online text book, the Adaptive Book software we have developed can be used to highlight, annotate and link content in the electronic version, add handwritten notes to the book and organize them on the Tablet PC, or even make voice recorded notes."

– Ananda D. Gunawardena,
Associate Teaching Professor of Computer Science,
Carnegie Mellon University

The study of human/computer interaction and its direction – looking into the usability of software, and the communication between the professor and students – and data mining – analyzing how people interact with electronic content – are both research areas that are contributing to the development of the Adaptive Book software."

Gunawardena described, "SJSU wanted to use three books from one publisher, but only needed to leverage specific sections from each, so we approached the publisher requesting a custom book – comprising three chapters from one book, two from another etc. – in electronic format and they were gracious enough to oblige. We used an authoring tool to automatically generate the table of contents and then we loaded the files onto a central repository so the students have to authenticate with the server to gain access to the textbook copy. Once users have access to the online text book, the Adaptive Book software we havedeveloped can be used to highlight, annotate and link content in the electronic version, add handwritten notes to the book and organize them on the Tablet PC, or even make voice recorded notes."

Via the Adaptive Book software, note-taking and annotating tools allow teachers to organize their personal notes alongside the textbook copy. During class presentations the book can be displayed in one window on the HP Tablet PC and the notepad can be used to enter in explanations associated with the relevant section. A digital link to the central server enables these notes to be attached to the location within the textbook, as a dynamic HTML file, which can be accessed later and shared with students at any time to re-live the lecture by following the annotations.

In addition, the Adaptive Book software helps in the creation of assignments or projects because it facilitates the linking of relevant references in the textbooks to specific steps in the project so that students understand exactly where to go for more information.

Technology honor roll
"The students got really attached to the HP Tablet PCs," Roldan said. "They liked the portability, and the wireless connectivity throughout the SJSU campus and other areas around San Jose. The biggest impact was the ability to use the device in settings where they were most comfortable – some of them became very popular in coffee shops! The students discovered that they could multi-task very comfortably with these devices. And, the 'inking' capability meant that they could be paperless and even leave the keyboard behind."

Roldan concluded, "HP mobility products are exceeding my expectations, particularly the HP Tablet PC TC1100. The design is perfect for helping both students and professors process the huge amounts of information they encounter on a daily basis. The connectivity makes it easy to conduct research on-demand and the screen resolution is such that I can really work with it as a paperless book. I'm beginning to see this as a multipurpose tool that can replace the PDA, my laptop, the whiteboard, and all of my stacks of paper. I think of it as a portable whiteboard. It can have a huge impact on education."

At a glance

- **Organization:** Carnegie Mellon University
- **Founded:** 1900
- **Location:** Pittsburgh, Pennsylvania
- **Faculty:** 3,000
- **Students:** 7,500
- **Telephone:** 412-268-8525
- **URL:** www.cmu.edu

Challenges

- Equip students with skills to work in today's and tomorrow's business environment.

- Teach students to be able to apply computing technology to solve business problems.

- Help students explore how mobility solutions can be deployed to make everyday processes more efficient and easier to execute.

- Explore methods to make conventional paper-based text more useful and accessible in the education environment.

Solution

- 48 HP Tablet PC TC1000s.

- 20 HP Tablet PC TC1100s.

- Adaptive Book software from TEXTCENTRIC, INC.

- 42 HP iPAQ Pocket PC model 5450s.

- 10 HP iPAQ Pocket PC model 4350s.

- 10 HP iPAQ Pocket PC model 1945s.

- Two HP Applied Mobile Technology Solutions in Learning Environments grants.

- One grant from Engineering Projects in Community Service (EPICS), a Purdue University program supported by HP and the National Science Foundation.

Results

- Students can multi-task and be more efficient with mobile technology.

- HP Tablet PCs and HP iPAQ Pocket PCs used to solve business challenges.

- Both teaching and learning benefit, via the HP Tablet PC and Adaptive Book software, by being made more efficient, by experiencing an enhanced educational environment, and by massively reducing the need for paper.

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: www.hp.com

The Adaptive Book is marketed by TEXTCENTRIC, INC (www.textcentric.com)

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