Singapore Management University may be the new kid on the block, but it could teach organisations a lesson or two when it comes to executing projects that engage users and stick to budgets. By JONATHAN HOPFNER.

Ultra-prestigious institutions like Harvard or Cambridge may wear their lengthy histories like badges of honor, but the story of Singapore Management University (SMU) shows how a relative upstart has its own advantages.

In early 2005, the IT team at the barely five-year-old school viewed an impending move into a new dry-center campus as a chance to turn university mission statements on promoting technology into realities, devising a system that brought the learning experience squarely into the information age and earned SMU an MIS Asia IT Excellence Award for Best Business Enabler. While the traditional classroom layout, where professors typically deliver lectures and presentations from a central location to a mass of students, continues to dominate at universities worldwide, many of SMU's professors and support staff saw it at odds with an institution that was supposed to pride itself on its dynamism. The small classrooms to be installed at the new campus were intended to promote a participatory learning style, but the contributions students could make to a class would still be limited by physical and technological constraints.

With only a single lectern and projector available for use, for example, any student wanting to present or share something on his laptop would be forced to move to the lecture and connect the computer to the projection equipment, then disassemble everything to allow the professor or another student to impose. This is a process the university admitted would be "disruptive, time-consuming and tedious".

Practising what you preach
With providing an "interactive, participative and technologically-enabled learning experience" at the heart of the university's philosophy, SMU's Office of Communications and IT had a clear case for investing in a solution that would help educators and students skirt classroom limitations, recalls the office's director, Foo Yin Kee.

"It's easy for us to look at how we should apply technology to align with the business," he says. "We didn't have to soul-search to decide how we should do it." Initial discussions with the university's faculty did
indicated there was a clear appetite for a classroom revamp that would foster student involvement, with a few caveats.

"[The professors] asked us to reduce or eliminate technology disruptions in the classroom," Foo says. "Technology being technology, if it doesn't work it creates more harm than good, and instead of increasing interaction you kill interaction."

The central message from the future user community, Foo says, was "just give us technology that works, and we'll use it the best way we see how."

Even before the design stage, he says, the IT team was well aware of the importance of having "pedagogy drive the classroom design, including the technology, not the other way around."

Foo was also acutely conscious of the need to keep the solution as simple and accommodating as possible, to appeal even to those professors who rarely used IT to reinforce their lessons. "The classroom should be generic and should accommodate all professors using all pedagogies," he explains. "To do that you may have multiple pieces of technology, and some professors will use more and some will use less. That all has to coexist, and when there are too many technologies sometimes it can be confusing—it's almost like you've got too many buttons to press. [The IT department's] job is to simplify and enhance, so that people are encouraged to use [the solution]."

"I don't think it's professors alone, but the world over, people always ask 'Can you not schedule training that I have to follow? My time is not best spent learning how to use your technology?" Foo adds.

Seeking input
To come up with a design blueprint, the office decided to seek advice from the experts, dispatching staff on a study tour to find out how some of the top universities in the United States put the latest
equipment and software to use. When they returned they were able to draw up tentative classroom designs, but took pains to ensure the teaching community would have a chance to weigh in on these before the framework was finalised.

The office asked each of SMU's schools to appoint a minimum of two professors to form "special interest groups" that would evaluate and provide input on the various options. After the office had incorporated their feedback, the designs were presented to the university's IT Steering Committee and Faculty IT Advisory Board, which together govern SMU's technology strategy. Even the institution's president had to comment and sign off on the office's plans.

The IT team had every reason to be confident in the final "classroom technology design blueprint" that emerged from this lengthy consultation process, but Foo still wanted to test it out before it became the norm. The office set aside one of the classrooms at the university's soon-to-be-vacated campus in Bukit Timah and designated it an "experimental" teaching facility, where design ideas could be tested and put through their paces.

"We wanted innovation, but we were also mindful of the risks of innovation," says Foo. "We didn't want to have 50 or 60 classrooms equipped from day one. If an innovation doesn't quite work, we're better off not implementing it because it causes more disruption. And if it involves 50 classrooms, the damage could be huge."

After close to one year of experimentation, most of it in close co-operation with faculty, the office had a template that could be rolled out across the new campus downtown. Foo says he was grateful for "the chance to get it at least half-right, if not fully right, rather than just carry all the inefficiency, all the inadequacy, from the old campus over here."

**Platform for interaction**

The result of the team's labour was christened the "virtual canvas". Developed with the help of Singapore-based IT services firm NCS, the solution uses SMU's wireless infrastructure to link students and professors' laptops to networked LCD projectors, allowing anyone who's interested to beam presentation material to the large screens found in each classroom.

The office also created a stripped-down interface, linked to the university's servers, that allows users to operate most of the equipment installed in the classroom remotely. With a click or two professors or students can broadcast usage requests or turn a classroom's screen over to a colleague. Professors are also now equipped with tablet PCs that allow them to add notes or diagrams to PowerPoint presentations on the spot. Administrators, meanwhile, are afforded regular reviews into the health of the system and its various components.

These tools have been supplemented with additional inventions like an all-in-one lectern that has largely eliminated the tangle of cables formerly needed to sustain a laptop. The adjustable podium is equipped with a whiteboard and overhead camera—also linked to the classroom's main

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**SYSTEM ARCHITECTURE**

![System Architecture Diagram](image-url)

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Source: Managing Information Systems, MIS Asia
screens, so those professors who still insist on writing out their notes can do so, just one example of the concessions the project leaders were careful to make to keep the user base engaged.

“What we definitely don’t do is preach only one way of teaching. Some people have certain styles. We try to be flexible, but at the same time we encourage faculty to try new things,” explains Themin Suwardy, an associate dean at SMU’s School of Accountancy and a member of the university’s Faculty IT Advisory Board.

Foo says the office’s consistent efforts to seek the input of the user base and design the solution to their requirements proved to be the project’s “critical success factor,” even if the feedback was not always positive.

“(The professors) were not that abusive, they were just a bit demanding,” he laughs. “But they didn’t sit back and let us do our job, which I’m thankful for. We don’t teach, so we never know what they need. If they had not been supportive, we would still be trying to guess what it is they want. And of course if you’re guessing most of the time you probably get it wrong. [IT] merely facilitates, we don’t know how to make it work.”

Leong Kwong Sin, an associate professor of accounting who chairs SMU’s Faculty Advisory Board, says the teaching community highly appreciated the office’s “user-centric philosophy. One of my greatest grouses against IT in the past was that every time you wanted something they would ask why you couldn’t adapt to their system. I’m the user, please adapt your system to my usage?”

Pricing pressures
While the office, staff and students may have been united in advancing the project, it faced several hurdles, including a tight schedule dictated by the university needing to open for the new academic year in August 2005. But finding the right vendor to implement the school’s visions proved one of the most persistent challenges. According to Foo, many of the providers approached with its design were either disinterested, seeing the school as a small customer, or came up with packages that were prohibitively expensive. It took time and some out-of-the-box thinking to cement the right partnership.

While the IT team may have been able to develop more components of the virtual canvas in-house, Foo dismissed this option, believing it would be more efficient in the long run for the office to assemble off-the-shelf solutions. “We don’t want to create technology because we can’t sustain the cost,” he says.

Benefits all round
Instead, SMU reached an arrangement with key vendors involved in the project through which some of the intellectual property (IP) developed by the school could be incorporated into their solution sets and marketed to other institutions. This had a direct impact on the pricing and support schemes the university was offered.

“The IP was intentionally surrendered to the vendors, and if they can use it successfully, sell it a lot, it will cost us less to operate,” he explains. “Our competition in the market is not the technology, our competition is in the professors, in the way they teach. We let the vendors own the IP, but we get the right to use it and enjoy future enhancements without having to pay the development costs.”

The office is aware that some of its innovations could even be marketed in a different form to competing schools, but remains largely unconcerned.

“You can’t worry about things outside your own core competency,” says Leong. “We are not in the market to create state-of-the-art things to sell to others. If we help some vendors define some of their users’ needs, we benefit, and they benefit.”

Costs are also being kept in check by the conscious decision to keep the system as small as possible, a decision that has also pleased end-users. “We could have made the systems ten times bigger and more complex by hooking it up to registration, enrolment, payment, the library, and a whole lot of other things, but we wanted to make sure it was easy to use,” says Themin.

Payback time
So have the office’s efforts been worth it? The answer from the students, who are the intended beneficiaries of the project, has been a resounding yes. Through regular surveys the IT department has learned that a vast majority feel the virtual canvas has enhanced their studies by making it easier to contribute to lectures and share and compare their work. Desmond Wong, a student at SMU’s School of Information Systems, says the solution has resulted in more dynamic group presentations and drastically reduced the amount of time professors and students alike used to spend fumbling with cables and connections.

The project has also had more tangible benefits. According to the office, the new, intelligent classrooms have eliminated the need for staff to test equipment manually each morning, allowing the university to assign fewer staff to support duties and shave operational costs by over US$35,000 per year. The auto-shutdown capabilities boasted by some equipment have cut electricity bills to the tune of nearly US$81 million annually.

With other schools and government delegations now paying regular visits to SMU to learn from the institution’s experiences with integrating technology into the learning process, the university is apparently not short of recognition. But some involved in the project still seem pleasantly surprised by its achievements.

“We were lucky to have all the combinations in place: the pioneering student spirit, the knowledge that we would have a city campus and that we all had a role to play, and the professors’ and IT’s support and willingness to do certain things differently,” Themin says. “If we didn’t get this right, we would have suffered for many, many years to come.”