



Case Study

Predictive Enterprise

Intel® vPro™ Processor

Technology

Intel® Core™2 Duo Processor

Intel® Centrino® Processor

Education

Campus IT Infrastructure

Fusing Technology And Arts Education

Taipei National University of the Arts has tertiary education built-in with Intel® technologies

As one of the leading arts education institutions in Taiwan best known for cultivating multi-faceted artistic talents, Taipei National University of the Arts (TNUA) knows that technology is key to sustaining quality tertiary arts education today.

This emphasis on technology complementing arts education is what led TNUA to constantly seek new upgrades and infrastructure expansion for its Computer Centre. However IT upgrades and expansion often come at the expense of manpower, time and energy resources.

For TNUA, the answer to this issue came in the form of PCs running on vPro™ processor technology¹, Intel® Core™2 Duo and Intel® Centrino® processor technology, allowing the university to reap the greater benefits at lower costs.



“Intel® technologies have been instrumental in helping TNUA achieve our goals of delivering quality arts education with greater productivity and cost efficiency.”

Paul Yang
Division Head
Teaching Support and
System Development

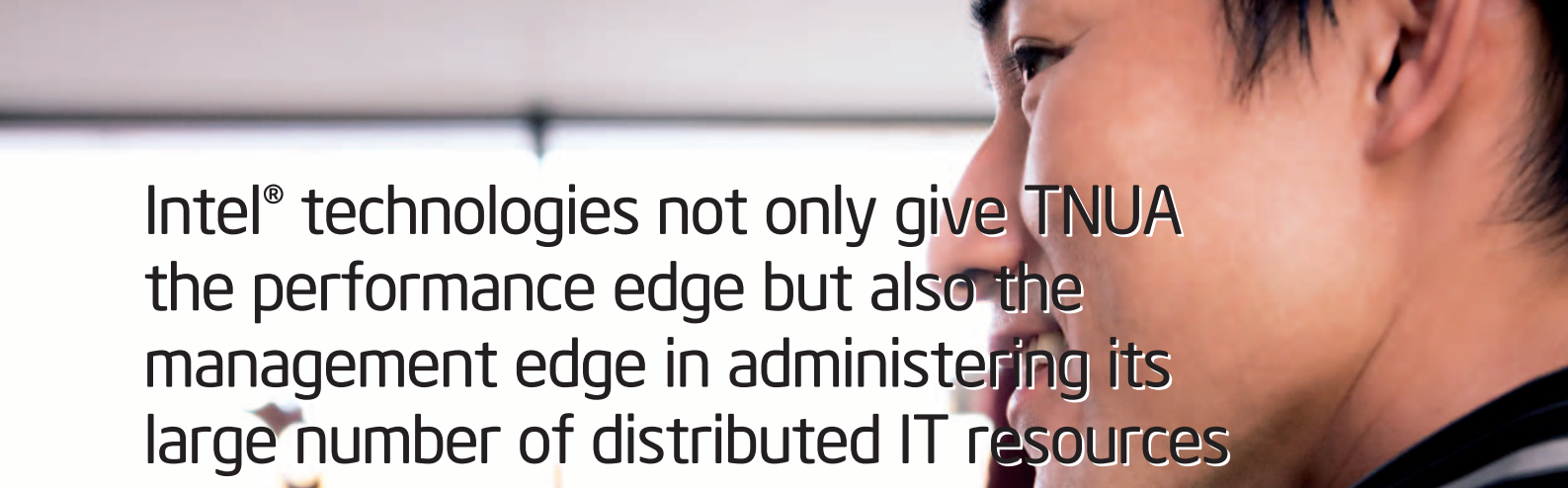
Taipei National University
of the Arts

Challenge

- **Sustain quality arts education with technology**
TNUA needs to complement its arts education curriculum with technology in order to maintain high standards and industry relevance.
- **Match technology acquisitions with available resources**
TNUA also needs to ensure that technology upgrades and expansion does not overwhelm its existing manpower resource, which is growing at a slower rate than its IT infrastructure.
- **Lower energy consumption costs across the board**
Additionally, TNUA is also looking to curb excessive energy costs as a result of its technology acquisitions, lowering overall ownership costs in the long run.

Solution

- **Develop a long-term IT strategy**
To meet its challenges, TNUA needs to develop a Predictive Enterprise strategy that can sense, predict and act on current and future technology needs to maintain high standards and industry relevance.
- **Work with Intel on the latest computing technologies**
Turning to Intel® multi-core architecture and hardware-based PC management technology, the university found a powerful, robust computing solution that works perfectly alongside its IT strategy.
- **Acquire the right tools for the job**
Systems running on vPro™ processor technology, Intel® Core™2 Duo and Intel® Centrino® processor technology form the backbone of TNUA's enhanced IT Infrastructure.



Intel® technologies not only give TNUA the performance edge but also the management edge in administering its large number of distributed IT resources

Assessing the Situation

TNUA was first established as the National Institute of the Arts in 1982 before being renamed Taipei National University of the Arts in 2001.

Along the way, TNUA has produced famous alumni such as the likes of cellist and conductor Mstislav Rostropovich, composer Ma Shui-Long, choreographer Lin Huai-min, and theatrical set designer Ming Cho Lee.

Besides its prestigious reputation as an art university, TNUA's Computer Centre was also renowned for being one of the best e-campus amongst art colleges in Taiwan.

Spotlight: Taipei National University of The Arts (TNUA)

- Taipei National University of the Arts is located at Kuandu in Beitou District, Taipei City, Taiwan.
- The university was first established as the National Institute of the Arts in 1982 and was housed in Luchou, Taipei County, from 1985 before moving to its permanent campus in 1991.
- The National Institute of the Arts has since been renamed Taipei National University of the Arts in 2001.
- TNUA currently boasts six faculties, 33 research centres as well as a student and staff strength of 3000 in various faculty disciplines such as music, fine arts, theatre arts, dance, and cultural resources.
- TNUA also houses a state-of-the-art Music Hall, a Performing Arts Center including a theater hall and a dance recital hall, the Kuandu Museum of Fine Arts, a library, an Olympic size swimming pool, a Center for the Study of Traditional Arts, a computer center, and a Center for the Study of Art and Technology.

**Source: <http://www2.tnua.edu.tw/etnua/index.php>

In addition, TNUA was also looking to take steps toward becoming a Predictive Enterprise, using technology to make its business proactive instead of reactive by reducing the gap between knowledge and execution. As a Predictive Enterprise, TNUA would be more agile, maximizing return on investment (ROI). The key to becoming a Predictive Enterprise is learning how to develop business processes and infrastructure that are connected and adaptive.

However, overseeing 1,000 IT assets distributed across TNUA's six faculties, 33 research centres, and 3,000 teaching staff and students was no easy task for TNUA's Computer Centre even with the university's Predictive Enterprise strategy. And TNUA's IT upgrading and expansion initiative would only see the university's IT asset base grow larger over time.

With only five key personnel monitoring such a high usage volume, this was a constant test of the Computer Centre staff's ability to react to administration emergencies in addition to regular system maintenance duties.

"TNUA's campus is not exactly small and the computer equipments are distributed throughout every building on campus. Whenever a need for maintenance and repair arises, Computer Centre staff would have to rush around the campus; and because of this, the school equipped the Computer Centre with a motorbike, hoping to resolve the problems of mobility and efficiency," says Paul Yang, Division Head, Teaching Support and System Development.

However even though the traffic tool could reduce travelling time, it could not solve the fundamental issue of managing TNUA's distributed IT assets efficiently.

"Each time a maintenance problem cropped up, massive manpower and time resources were exhausted to address the issue. This is especially evident whenever new software or a change of settings is introduced throughout the university. Staff at the Computer Centre would then be thrown into a maelstrom of activity addressing IT issues throughout the campus," Yang says.

"Intel® vPro™ processor technology allows TNUA to manage our distributed IT assets without taxing our existing manpower resources."

Paul Yang
Division Head
Teaching Support and System
Development Division
Taipei National University
of the Arts



“PCs running on Intel® Core™2 Duo and Intel® Centrino® processor technology delivers superior computing performance to TNUA.”

Paul Yang
Division Head
Teaching Support and
System Development Division
Taipei National University
of the Arts

To adequately address productivity and efficiency issues in managing TNUA's growing IT asset base, the university turned to Intel for answers.

Delivering the Solution

After much deliberation on its computing performance and IT asset management needs, TNUA's Computer Centre acquired 200 systems, of which 120 were Intel® vPro™ processor technology-enabled PCs powered by Intel® Core™2 Duo and Intel® Centrino® processor technology.

These systems were deployed in areas of software and hardware maintenance, vPro management, iAMT as well as data management of SmartIT* asset management system and information security.

“As soon as we heard that Intel has launched its new hardware-based management technology that could achieve numerous management functions which were previously beyond software capabilities, the Computer Centre enlisted Intel's technical support to test and acquire the new technology,” says Yang.

And the university is not disappointed. According to Yang, the asset function of Intel® vPro™ processor technology can proactively seek out all vPro PCs in the school; Even if the PC is not switched on, it can obtain the software and

hardware data of the particular PC and carry out checks.

Intel® vPro™ processor technology can also alter the power state of vPro PCs with remote control technology and make use of configured schedules to execute system updates and configurations.

“Previously, any PC-related configurations and maintenance within the campus must be handled in person on the spot. And on numerous occasions, Computer Centre staff and teaching staff were unable to coordinate their schedules, limiting the time available for maintenance,” says Yang.

After the deployment of Intel® vPro™ processor technology, the Computer Centre displayed significant improvements in management efficiency.

Yang remarked that with regards to processing computers by timed batches, the Computer Centre could now even shift maintenance schedules to off-peak night periods to avoid disrupting users' work.

And in real-time online obstacle removal, when a computer displayed a problem in hardware settings, the Computer Centre personnel could now address the issue via Intel® vPro™ processor

Key Technologies

- Incorporating Intel® Active Management Technology (Intel® AMT), part of Intel® vPro™ processor technology, allows the Computer Centre to remotely administer TNUA's distributed IT assets. This helps the university meet its Predictive Enterprise goals by sensing and analyzing changing flows and demands for infrastructure or storage consumption, predicting resources needed to maintain transactional performance, and acting to meet capacity demands.
- Intel® Core™ microarchitecture forms the next fundamental platform for TNUA's computing needs.
- Intel® Core™2 processor technologies, based on Intel® Core™ microarchitecture, deliver superior processing power to TNUA.
- Intel® Centrino® processor technology leverages on enhanced communication capabilities and delivers reliable performance to TNUA across the board.

Integral Answers

- As part of TNUA's IT upgrading and expansion drive, the university's Computer Centre acquired 200 PCs recently.
- Out of these, 120 PCs running on Intel® vPro™ processor technology, Intel® Core™2 Duo and Intel® Centrino® processor technology form the Computer Centre's frontline hardware deployment.
- In all, the 120 PCs were deployed in software and hardware management and maintenance as well as data management and information security solutions.
- With advanced sensing capabilities, TNUA is now able to predict its needs and act to produce both energy and cost savings. These are the key steps to becoming a Predictive Enterprise.

technology's Serial over LAN connection and execute repairs to system settings and operating system, greatly reducing the time and manpower expenditure on on-site maintenance.

Apart from this, vPro PC also sped up checks. As software data could now be obtained even if the power state of the computer was off, a significant amount of time could be saved for asset checks and queries; and even power consumption could be cut down.

In all, TNUA's Predictive Enterprise strategy yielded these improvements:

- Sense: Intel® vPro™ processor technology's remote asset resource management capabilities allow TNUA to sense and analyze changing flows and demands in infrastructure usage.
- Predict: Intel® vPro™ processor technology provides energy-efficient capabilities that allow TNUA to predict which resources it will need and switch off unused systems or transfer processing capacity to another service. The results are faster, more stable and energy-efficient computing platforms.
- Act: In all, Intel® Core™2 Duo and Intel® Centrino® processor technology deployment also contributed features such as lower energy consumption to boost the overall stability and reliability of TNUA's daily operations. It is now possible for the university to boost processing capabilities more effectively while significantly boosting system responsiveness and reducing overall energy consumption.

Post deployment, TNUA's Computer Centre assessed that yields had indeed doubled and effort halved in the area of IT asset management.

"Due to the remote management functions of Intel® vPro™ processor technology, we prevented close to 40 percent of on-the-spot maintenance cases and can now speedily and efficiently achieve systems update, giving TNUA a secured network environment!" said Yang.

And that is another feather in the cap for arts education in Taiwan.

Find a solution that is right for your program. Contact your Intel representative or visit the Intel Business/Education Web site at:

intel.com/go/education

or visit the industry solutions-specific sites at:

www.intel.com/business/bss/industry

For more information on Intel vPro technology, visit:

www.intel.com/vpro

Return on Investment

- By adopting a Predictive Enterprise strategy, TNUA's Intel® technology deployment allows the university to sense, predict, and act rapidly on its IT challenges.
- With the successful deployment of Intel® vPro™ processor technology, TNUA can now realize lowered maintenance and manpower costs from the remote administration of its distributed IT assets.
- PCs enabled with Intel® vPro™ processor technology are able to remotely administer, control and batch schedule off-power checks on TNUA's distributed IT resources.
- As such, Intel® vPro™ processor technology-enabled PCs deliver ultra-high returns to TNUA, not only ensuring that the Computer Centre's manpower resources will no longer be spread thin but also saving TNUA 30 to 40 percent in manpower costs.
- Intel® Core™2 processor technology also delivers a faster and more stable, energy-efficient solution to power TNUA's computer systems.
- Additionally, Intel® Centrino® processor technology delivers enhanced communication capabilities and reliable performance to TNUA.

***Taipei National University of the Arts



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¹PCs with Intel® vPro™ technology include Intel® Active Management Technology (Intel® AMT). Intel AMT requires the computer to have an Intel AMT-enabled chipset, network hardware and software, connection with a power source, and a network connection.

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