



# MOBOTIX

## CASE STUDY

### Republic Polytechnic In Singapore

#### Education Of The Future – Paperless, Wireless And Safe

The Republic Polytechnic (RP) is one of five polytechnics in Singapore – and one of the most modern in the world. First established in August 2002, the number of students increased from 800 in 2003 to 3,600 in 2005. The courses of study include communications and automation technology, information technology and applied sciences such as biotechnology and new media.

All students and staff at the RP have notebook computers that are connected with the campus network via wireless LAN. Course information is exchanged using the polytechnic's own e-Learning system and even tests can be taken online. The RP represents the education of the future - paperless, wireless and safe.

#### Biotechnology Center

Singapore has one of the most deregulated, privatized economies in the world. The country is developing into the biotechnology center of Asia, supported by A\*STAR (Agency for Science, Technology and Research), a government agency devoted to promoting research in Singapore. With such courses of study as biomedical electronics and biotechnology, the Republic Polytechnic is one of the polytechnics which produce qualified professionals for this dynamically growing sector of the economy.

#### A Model Of Education

The polytechnic built a mobile computer infrastructure in order to implement its concept of the paperless campus. In addition to the wireless data network, this also means that all the stu-



dents and staff use either a notebook or a tablet PC. This mobile computing infrastructure also serves as a basis for a comprehensive range of communication tools, including Internet applications, e-mail, Instant Messenger applications and IP telephony (Voice over IP), which are installed on all laptops/tablet PCs. Using their computers and the connection to the wireless networks, staff and students have everything they need to do all their work. Numerous network cameras supplied by German manufacturer MOBOTIX have been part of this high-tech environment since March 2005. The cameras are used for security and administration tasks and were easily integrated into the existing network infrastructure.

Security Vision Systems





The Republic Polytechnic combines modern architecture and state-of-the-art security equipment.

### Spacious Campus

The polytechnic first opened on the former premises of the Data Storage Institute in 2002 and now has two sites. The Tanglin Campus and the Phoenix Campus are separated by a street. The spacious grounds are home to all the polytechnic's buildings and outdoor facilities. 300 staff members alone are responsible for the administration and the management of the buildings and other facilities. Since the Republic Polytechnic has been designed to hold up to 13,000 students in the future, the administration has been looking for ways to reduce the staff needed to monitor laboratories, special areas and sports facilities. In addition, the polytechnic was also interested in increasing on-campus security. In order to meet these goals, the administration decided to have modern network cameras installed.

After a number of different offers and systems by various manufacturers were evaluated, the decision was made in favor of German manufacturer MOBOTIX, which is represented in Singapore by its distributor, Spiraltech Pte Ltd ([www.spiraltechpl.com](http://www.spiraltechpl.com)). Michael Tan, who was in charge of the polytechnic project, commented: "The Mobotix solution ensures high return on investment in the long run. Because this solution is 100% software driven, the cameras can be easily upgraded at no additional cost to provide better features and software enhancements." Another criteria that spoke in favor of MOBOTIX products was the high degree of user convenience and the fact that this solution requires no additional back-end software – not even on the FTP server.

### Increased Security With Less Staff

The cameras were installed to monitor the laboratories, the student cafeteria, sports facilities, the entrance, the service area and the library. The labs were outfitted with cameras primarily to reduce the staff requirements, while increased security was the main reason for having the cameras in other areas.

### Easy Access To Images

A total of 75 MOBOTIX network cameras were installed in March 2005, and all are connected via the Republic Polytechnic's fast fiber-optics LAN backbone. The recorded image data is transmitted in encrypted form and stored externally on the polytechnic's file server with a NAS storage capacity of up to 2 terabytes. Thanks to the ring buffer concept, it is possible to retrieve the recorded images over a period of several months.





### Day And Night, Indoor And Outdoor

The system uses different indoor and outdoor models of the MOBOTIX M10, including the dual lens M10Di-Night, which is able to deliver brilliant, detailed images during the day as well as at night. The outdoor models are IP65-certified and do not require any additional casing. All cameras are equipped with an integrated image memory of 64 MB (for up to 2500 JPEG images in VGA quality) as well as FTP, e-mail and audio functionality.

### Time-Controlled Recording

The polytechnic staff can monitor the current images transmitted by up to 25 cameras on a single monitor. They can also control and configure the system for event-controlled or time-controlled recording via a central management console without requiring any special training. Each camera, for example, can be set individually to record a specific time before and after events, including the sound from the camera microphone. Upon events, the cameras send emails with attached video clips. To prevent unnecessary event emails, the cameras are using the built-in weekly schedules to report incidents only during off hours. The weekly program also handles holidays and specific times of day. Because the images are already processed (i.e. the data is compressed) in the camera, the network load caused by the transmission is very low as it is.

### Moving Plans

Since the RP was initially designed for 13,000 students, plans for a completely new campus were made early. The new Woodlands Campus, with a total area of 20 hectares and capacity for about 5,000 students, will be completed in 2006, when the RP will move into the new buildings. The network cameras will also make the move to the new location. And since the new systems proved their usefulness in a very short time, the polytechnic administration plans to install additional cameras on the new campus.

### Digital Campus

The polytechnic of the future will continue to take advantage of all the modern opportunities that computer technology and data transmission have to offer. This means

that the RP students and staff can use their notebooks to complete most of their tasks via the Campus network. Security is also an important issue on the new polytechnic grounds – and modern network cameras from Mobotix supply that.





## MOBOTIX Technology – Cost Savings in Every Aspect

### High Resolution For Sharp Images

All MOBOTIX cameras are high-resolution cameras with integrated image storage and 960 lines (1280x960 pixels) resolution. The **stored image** thus contains 12 time more detail for creating zoomed sections of the image than regular cameras with 240 or 288 lines (CIF, 2CIF). This is why one single MOBOTIX camera with a 90° wide-angle lens is sufficient to monitor an entire room and yet provides more detailed images than traditional technology. The MOBOTIX Day/Night cameras feature zero maintenance with one color and one B/W image sensor.

### Intelligent Storage Technology Uses Fewer DVRs

The new, decentralized storage technology pioneered by MOBOTIX reduces the number of recorders that store the smooth high-resolution video by up to 90%. 40 cameras store smooth video streams including audio on a single PC, each managing its own ring buffer and database. Intelligent search features provide swift access to the stored events. There is no software required for storing and managing video, eliminating license fees and the need for expensive software. Event-controlled recording and automatic increase of frame rates upon detecting movements drastically reduce the storage requirements.

### Low Power Consumption Means Enormous Savings

Since MOBOTIX cameras are anti-fogging, do not require heating and only use 3 Watts each, power can be injected into the network cabling using standard PoE products, year round. This drastically reduces the amount of cables and the power requirements for backup power.

### Integrated Telephone Features

All MOBOTIX IT and Secure models feature bidirectional audio support. The built-in microphone and loudspeaker are used for live audio transmissions and storage purposes. Voice messages with PIN confirmation and call forwarding via IP or ISDN telephony have been integrated as well. Using the switch outputs, you can switch lights or open doors from the phone or from the computer.

### Robust and Well-Protected

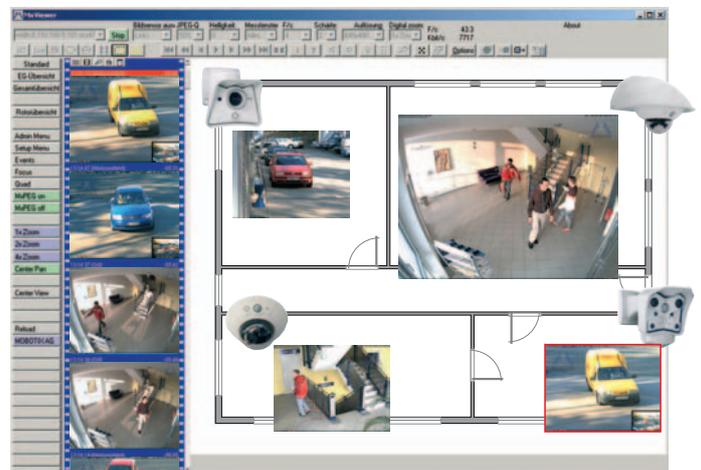
The fiberglass-reinforced housing is shockproof and the SecureFlex mount protects the network cabling as it completely conceals the cables (M12/D12 models). Weatherproof (IP65) from -30° to +60°C (-22° to +140°F).

### High Return on Investment

Since the number of cameras and storage capacity are freely scalable and any kind of data connection can be used (ISDN, DSL, Ethernet, Wireless, GSM, copper, optical), MOBOTIX means high ROI, even years after installing.

### State-Of-The-Art Technology

Developed and manufactured in Kaiserslautern, Germany, MOBOTIX produces image-storing weatherproof high-resolution cameras, including lens and wall/ceiling mount for as little as 598 EUR excl. VAT. To date, more than 100,000 cameras have been sold worldwide.



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