Intelligent Buildings for Varsity

Case study:

Singapore Management University

Why the need for intelligent building?

- To enhance Total Building Performance (TBP).

Ultimate goal of TBP

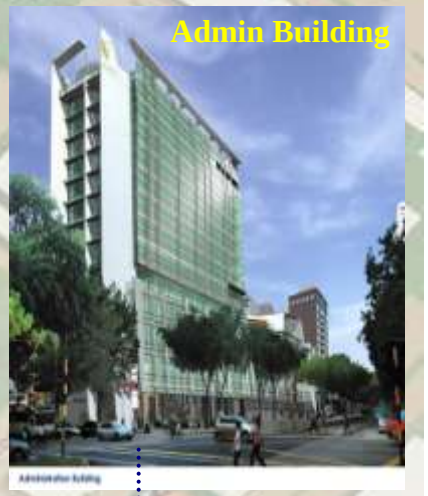
- To achieve the high performance of building while minimizing energy and resources use.

Passive Approach

- Passive design / features that help to reduce the dependency on air-conditioning, lightings and etc.

Active Approach

- Active design / intelligent building systems that effectively and efficiently manage the usage of air-conditioning, lightings and etc.



SINGAPORE MANAGEMENT UNIVERSITY

Singapore Management University locates at heart of city and occupies 4.5 Hectare of land .

Type of Intelligent systems

- ACMV system.
- Fire protection system.
- Integrated security system.
- Carpark management system.
- Energy / Power management system.
- Lighting management system.
- Facilities Booking and Charge-back system.
- Master clock system.

System Requirements

- Open Architecture to enable IP convergence.

  -*Based on Multi-Vendor industrial Open Platform (TCP/IP and Lonworks).*

- Interoperability.

  -*Open Platform is capable of accommodate multiple systems / applications, such as ACMV, Lightings, lifts and Elevators, Card Access, Blind Control, Cisco telephony and etc.*

System Requirements

- Scalability.

  -*Non reliance on a specific vendor enables multiple manufactures to provide more ingenuous product features.*

- Mobility.

  -*Capable of access to IBMS from desktop or wireless notebook any where in the campus to enhance response time.*

System Requirements

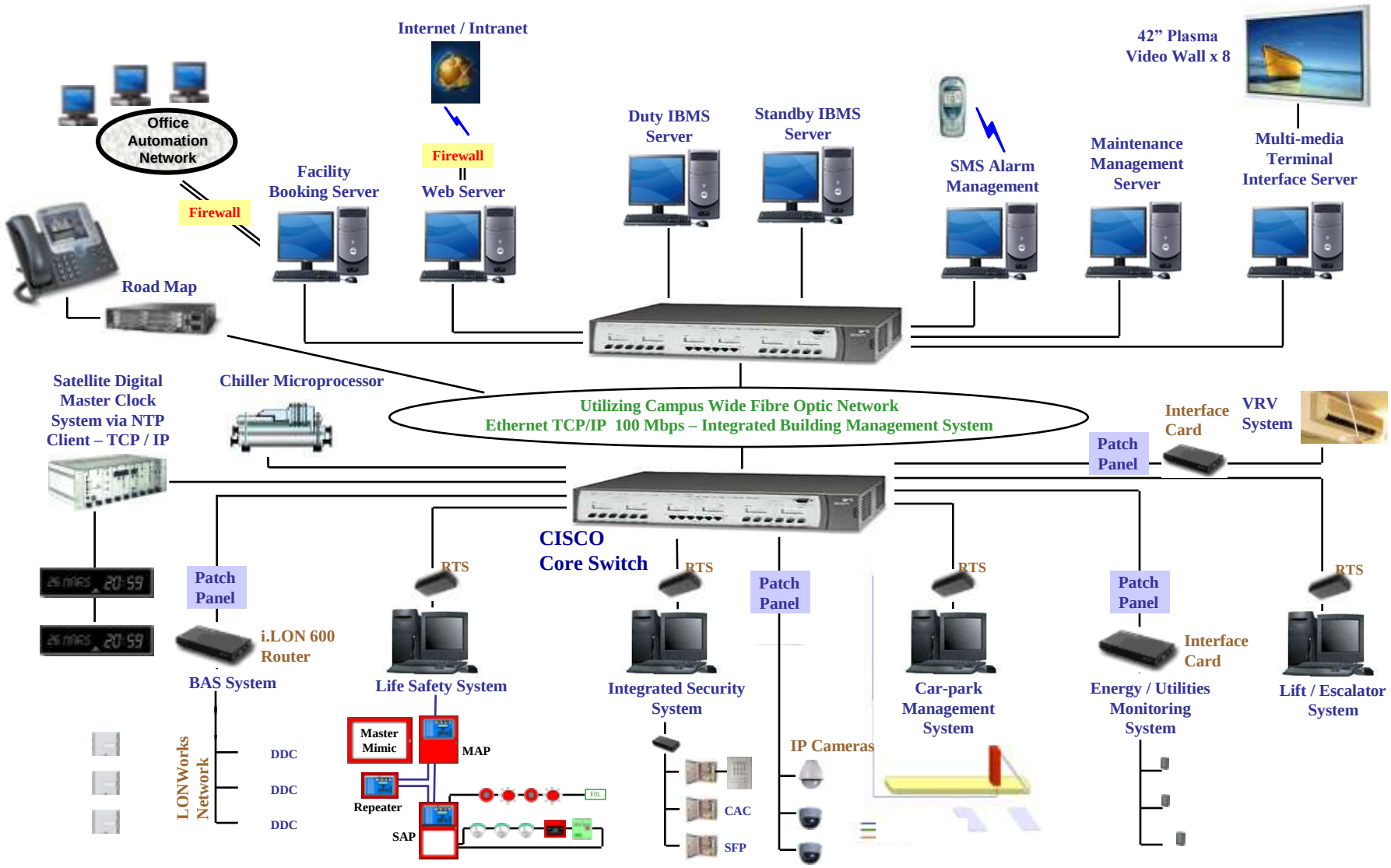
- Minimize life-cycle cost.

  - Open (non-proprietary) system provides options for future maintenance and replacement.

- Maximize infrastructure investment.

  - Integrate each independent system into a holistic and coherent system via the campus network.

SMU City Campus BMS / IBMS Architecture



Chiller operation

- Cross Matrix operation with flexible configuration.
- Auto change-over for effective chiller sequencing.
- Equipment lead/lag control ensure smooth operation.
- Self-balancing derive from de-coupling system facilitate optimum selection of chiller based on actual loads requirement.

AHU operation

- Optimal start/stop based on ambient temperature.
- Supply air temperature to modulate return valve to achieve desirable room temperature.
- Return air temperature to reset supply air set-point temperature.
- Static pressure to modulate VSD to maintain required pressure within duct.

Lighting control

- Alternate lighting circuits for mid-night operation.
- Link power and lighting with security access control enables automatic turn on/off power and lightings when access to facilities.

Achievements

- An holistic building automatic system.

  -*Fully automated operation for all systems by interfacing them via thru campus IT network.*

- A fully charge-back space system.

  -*All spaces are charged for usage to ensure they are optimum used.*

Holistic building automation.

- Operability.

  - *Ensure no disruption to building functionality that supports business activities conducting within it.*

- Efficiency.

  -*Enable efficient management of building services to optimize energy and resources used to sustain building performance.*

Charge-back space system

- **Effectiveness.**

  -Optimum usages of spaces reduce occupancy costs.

- **Sustainability.**

  -optimization of resources use enhances total building performance and improves productivity at workplace.

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