PROPOSED PROJECTS USING LOW-COST WIRELESS SOLUTIONS FOR NUST, ZIMBABWE

Clifford Sibanda, Trieste, February 2012

Background

- National University of Science and Technology (NUST) is one of the best universities in Zimbabwe due to the programmes on offer
- About 6000 students
- Established in 1991 as 2nd University in Zimbabwe
- Established on completely new site, so no inherited buildings or infrastructure
- I joined the ICT Services Department 2009- inherited ambitious 2006-2010 Strategic Plan

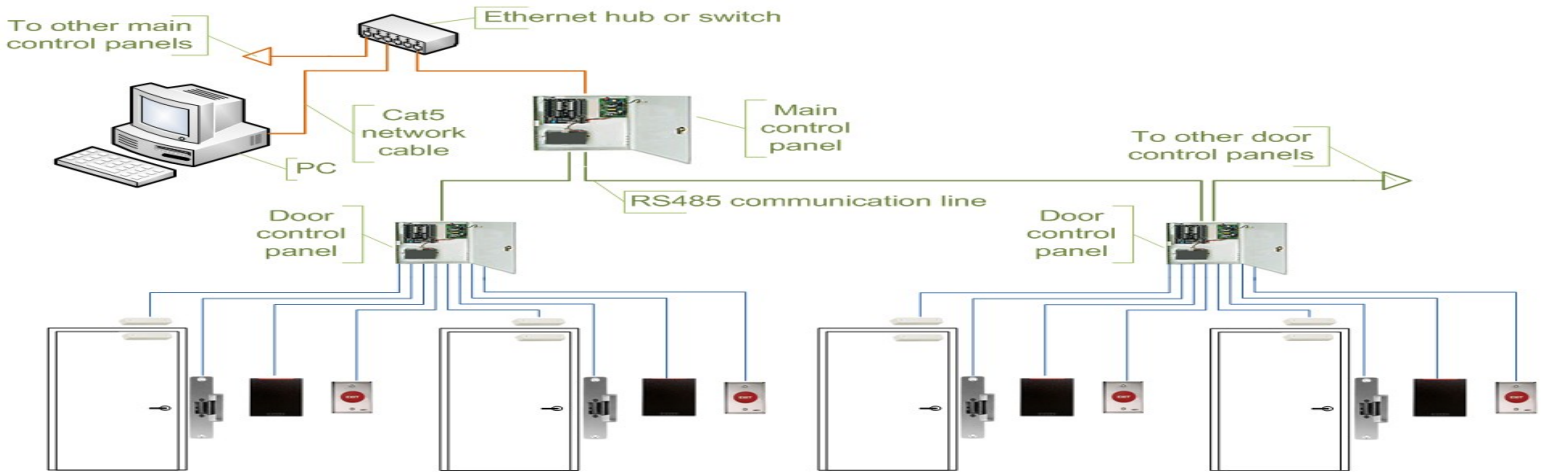
Problems

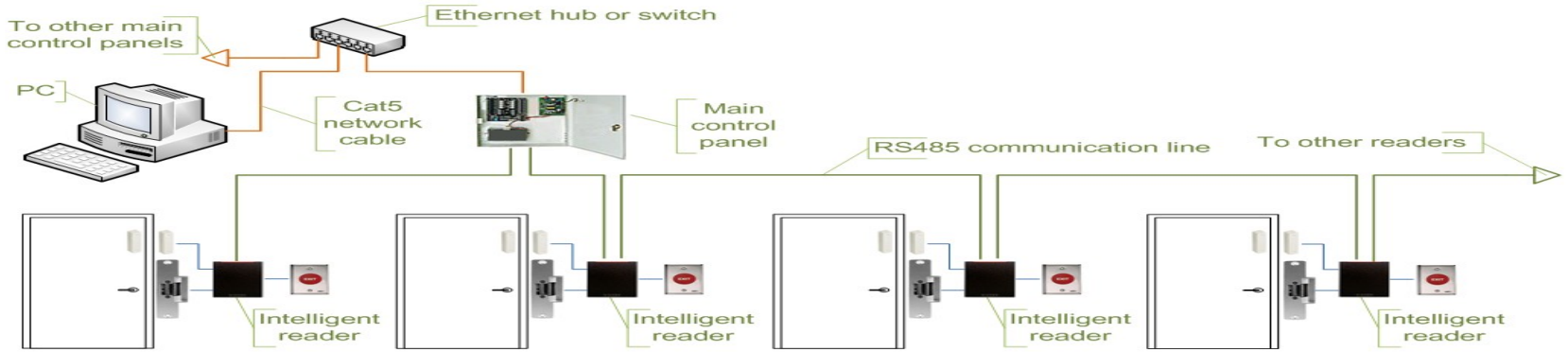
- Currently only 4 buildings usable and other buildings still incomplete or yet to be started
- No funds to complete the buildings
- No funds for projects
- Security in and around the buildings is minimal
- Power cuts –lasting up to 8 hours
- Very high electricity bills compared to income

Plans

- Set up the following systems at minimal cost
  - Access control systems
  - Security monitoring systems
  - Security alerting systems
  - Power saving systems
  - Disaster Management and Avoidance Systems
- Noting –Approved Budgets for the past 3 years have been below 40% of proposals submitted – these projects shelved in all these budgets

Access control Systems

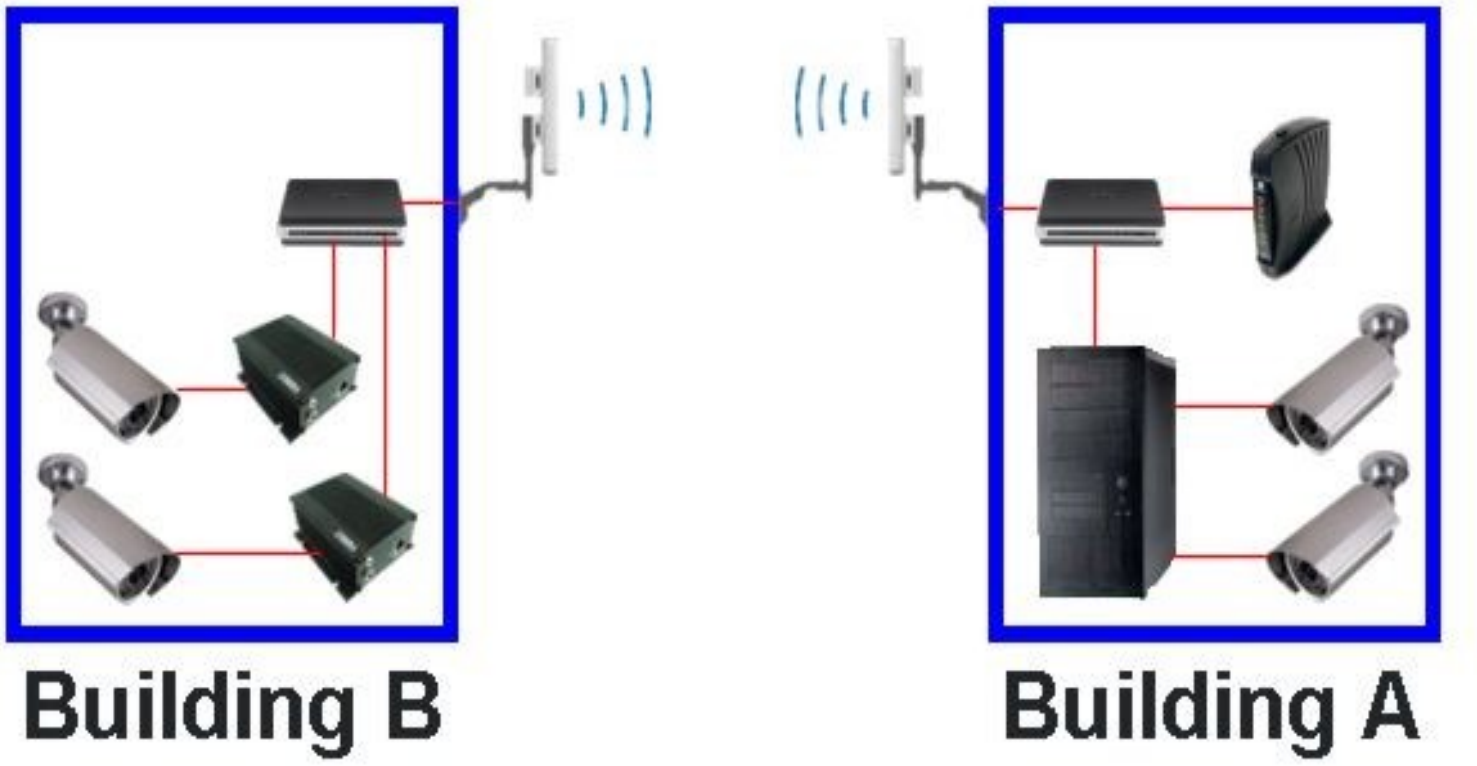




Access control Systems

- The aim is get authorised users of facilities utilise their IDs for access into facilities such as labs
- Simple technology that locks all doors after time X as determined by the authorities and allows access at time Y

Security Monitoring Systems

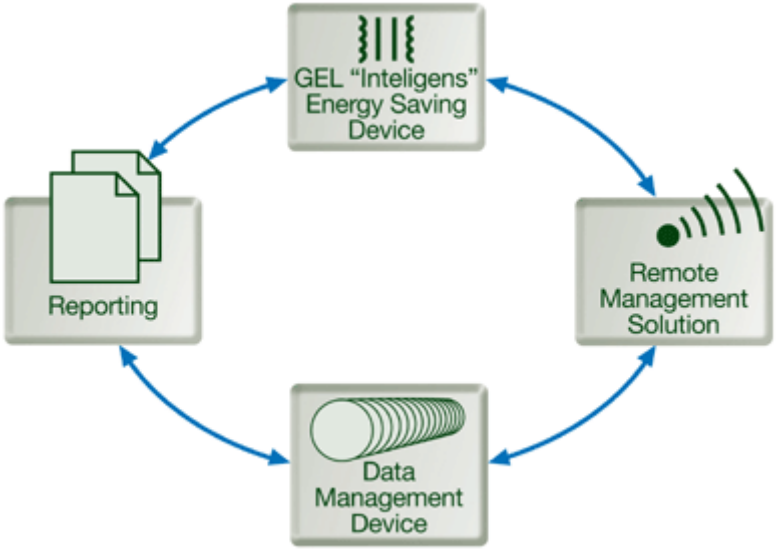


Security Monitoring Systems

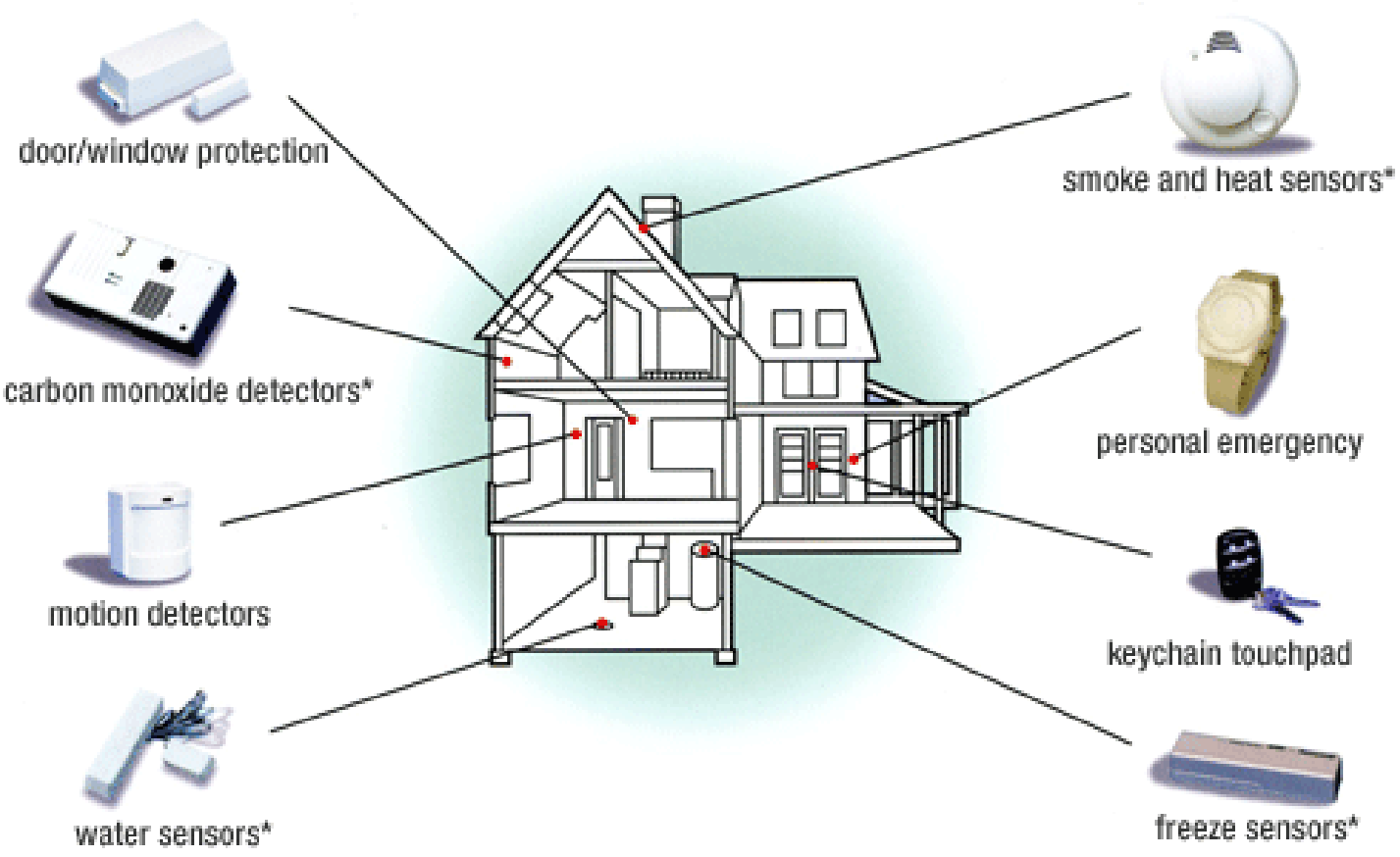
- Camera footage that can be used by University security
- Most building are still under construction even though in use, and thus some areas are not yet even wired up for electricity
- Motion detection and battery powered lights to activate camera footage would go a long way to assist the security

Power saving Systems

- In the buildings that have power, users leave lights, computers, heaters and all sorts of electrical devices on overnight
- Thus the electricity bill is too much for a small university with small income



Disaster Management & Avoidance



Disaster Management & Avoidance

- Smoke detection
- Basement flooding detection
- Over heating in Basement – Server Room

Solutions

- Wi-Fi broadband backbone links between buildings
- Sensors/ Motes deployment in strategic positions
- Infrastructure-less mesh routing of sensors data
- Autonomous management of the network to allow for optimal operation
- Priority & profile based system interaction & notifications

Why Wireless solutions

- Low cost – could use about 20% of the current proposed budget to deploy
- Easy deployment and Quicker
- No cables to cut or tampering access
- Simple solutions that are battery powered always available even when power is cut and little use of electricity – can use solar for recharging
- No need for big infrastructure installations

Way Forward & Conclusion

- Training of Technicians and Engineers by June 2012
- Prototype and lab set-up for demonstration, costing to be presented to management by the next budget proposal in September 2012
- Integrate project activities with postgraduate research
- Actively source supplementary funding & support
- Deploy a fully scaled project by 1st Quarter of next approved budget
- Feedback to interested parties

- THANK YOU !!!

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