Intelligent Buildings
System Integration
An Overview

By
Ken Gray
Performance Building Partnership

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The principal terms of reference are;

- Assessment of whole life value of intelligent buildings.

- Innovative approaches such as smart materials and nanotechnology, and embedded sensor technology.

- Development of strategy for healthy and sustainable buildings using appropriate levels of technology

- Integration strategies for products (systems), processes and people

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- An intelligent building is one that provides a productive and cost-effective environment based on three basic elements:

1. People (services users/facilities management)
2. Products (fabric, structure, facilities)
3. Processes (automation, control, systems, maintenance, performance) and the interrelationships between them.

- Intelligent Buildings help building owners, property managers and occupants realise their goals in the areas of costs, lifetime energy management, well-being, convenience, safety, long term flexibility and marketability to achieve buildings which have high social, environmental and economic values.

1970's - Hard Wiring, Switches and Levers

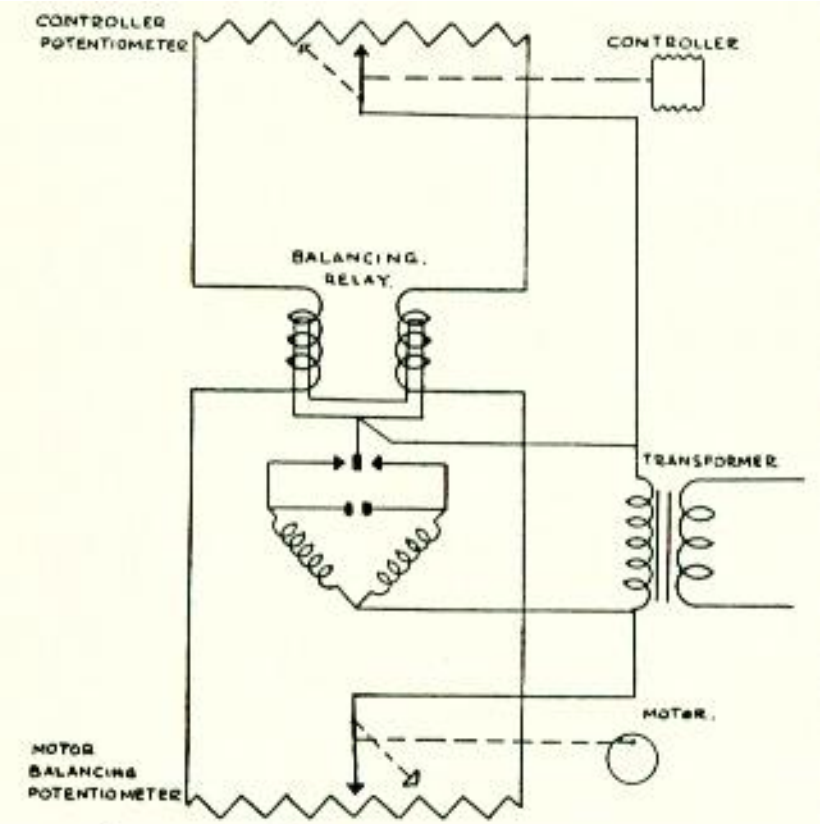
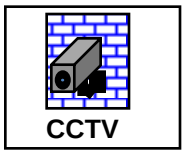


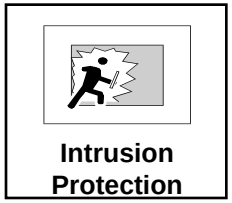
FIG. 17-35.—Electrical Circuit for Potentiometer Modulating Control.

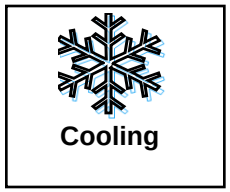
Electrical Controls
Pneumatic Controls
Hydraulic and oil

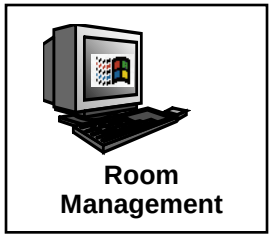
Adjustments on control parameters via screwdrivers and magnetic contacts.

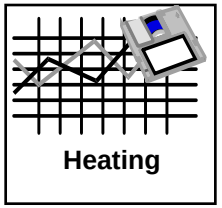
1980's and 90's -Lots of Island Solutions

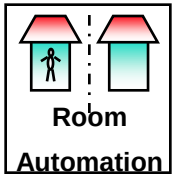


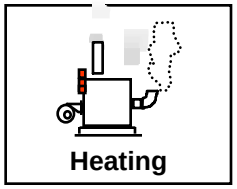


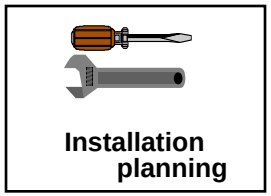


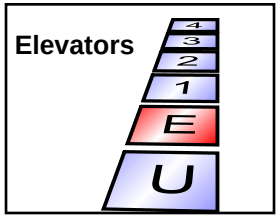












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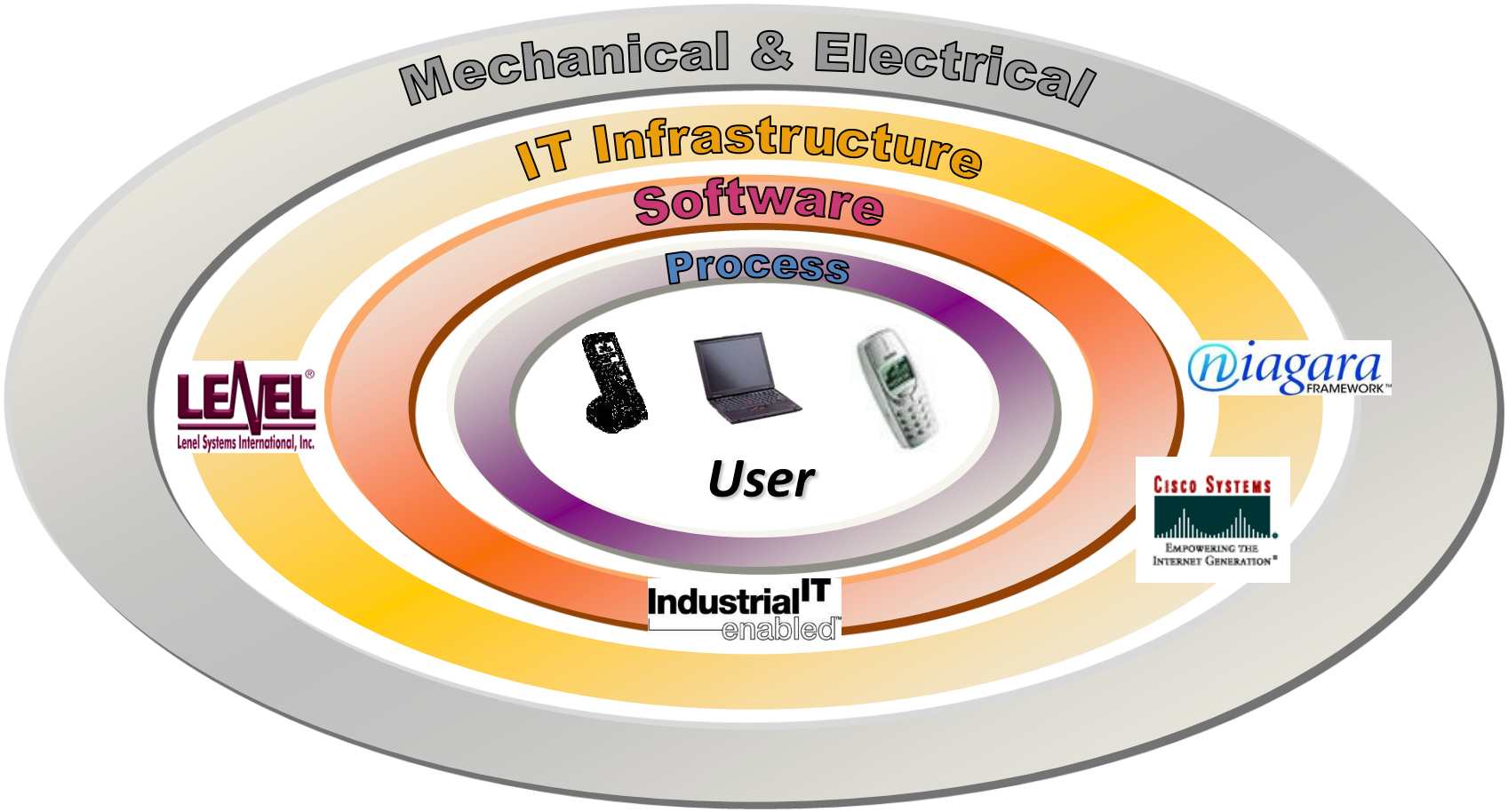
1980's and 90's - The Digital Revolution

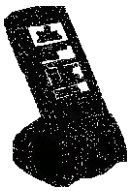
Building systems controlled via independent electronic or pneumatic systems .

- HVAC
- Fire
- Security
- Access control
- Car Park Management
- Lighting
- Etc

2000 onwards – IT and integration



Office Worker Performance



Workplace

Meeting Room

Remote (Home)

eLearning

MS Office

Office Tools

Virtual Meeting

IP TV

Unified Messaging

Collaboration

Room Environment Settings

Room Booking

Buying

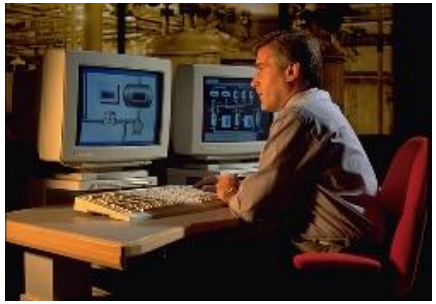
Convenience Services

Facility Manager

On Site

Remote (Mobile)

Enterprise



Energy Management

Climate Control

Energy+Comfort

Inventory

Space Planning

Assets

Access Control

People

Work Orders

Network Management

Security

Servers

IT

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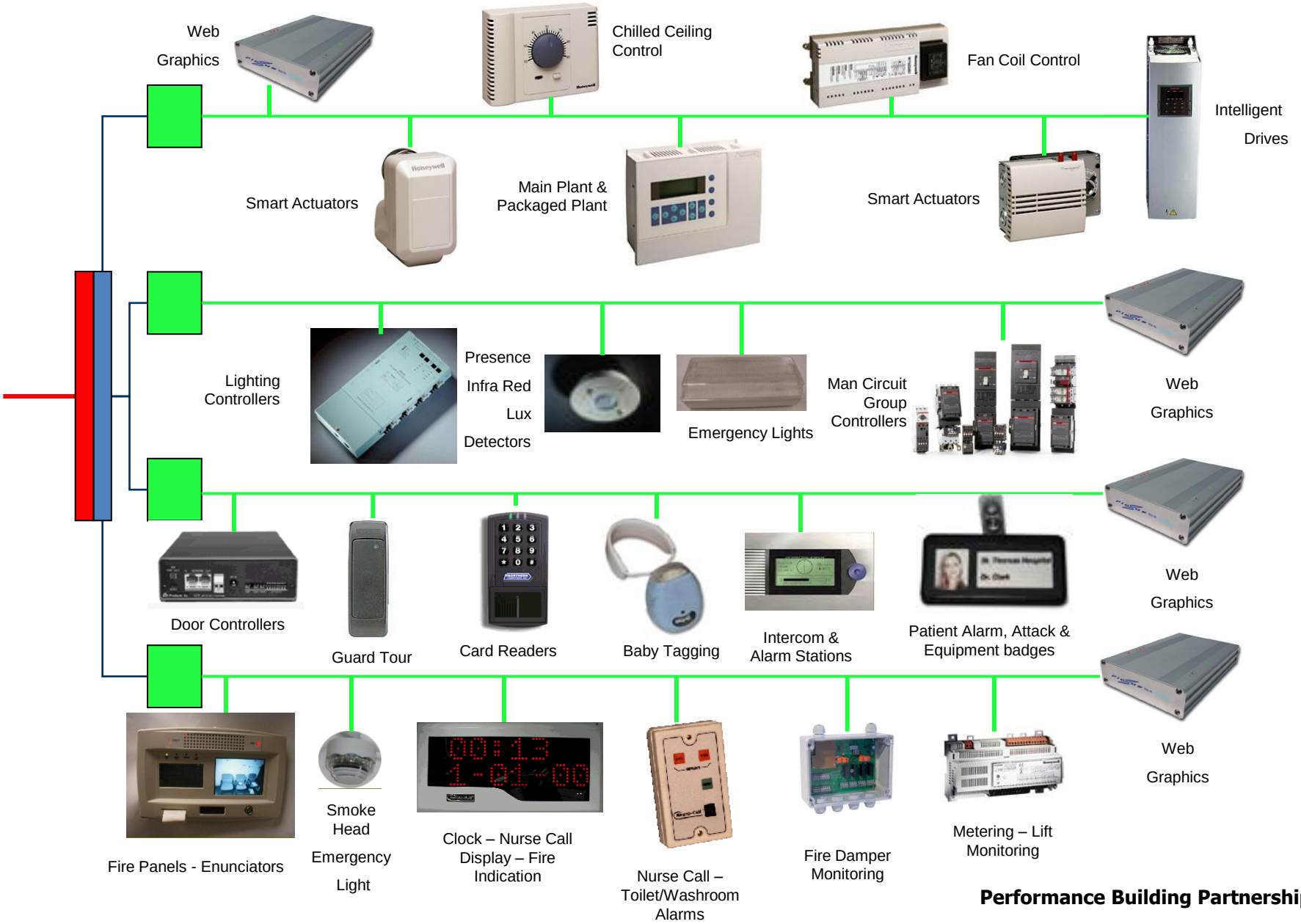
Typical Building Zone



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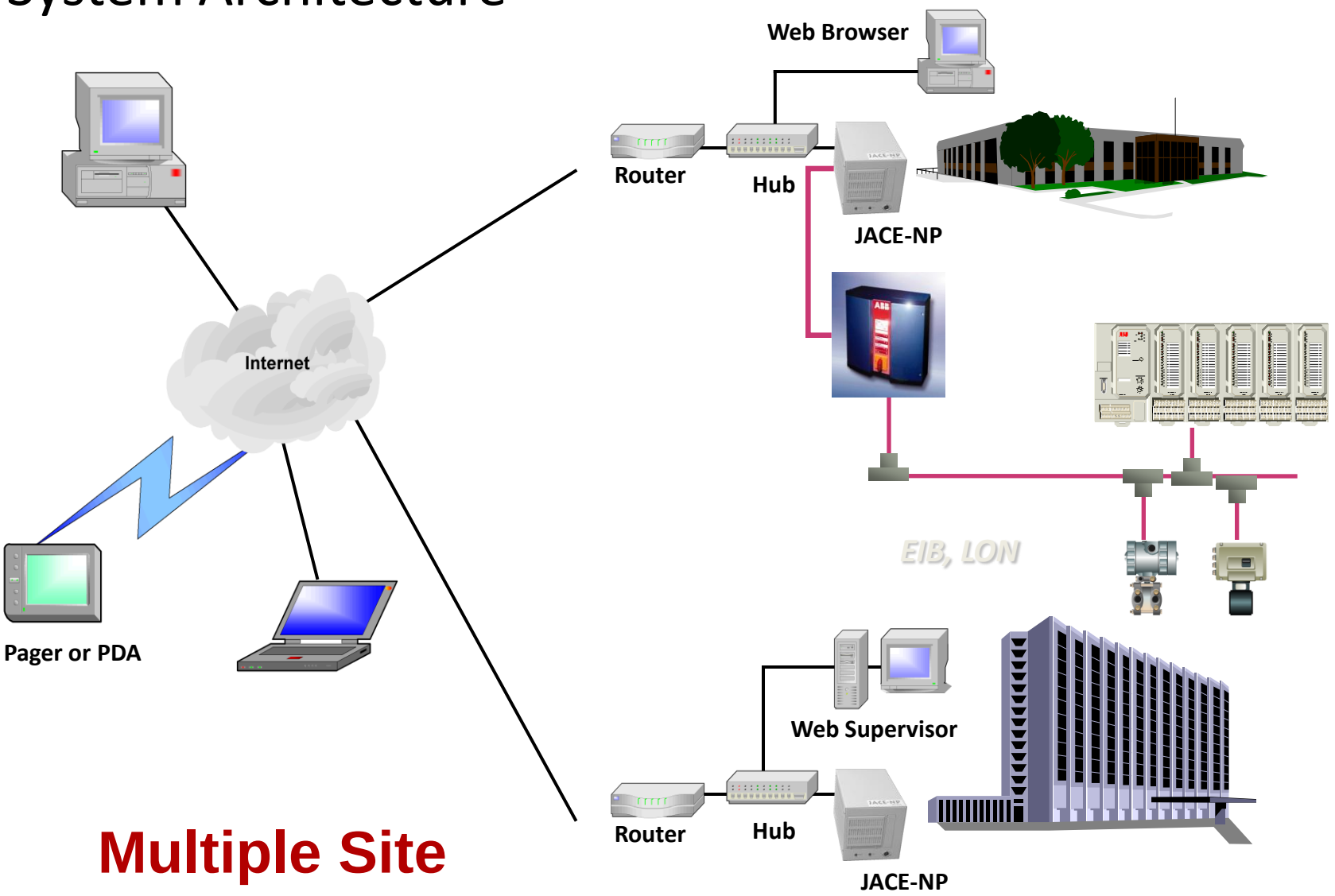
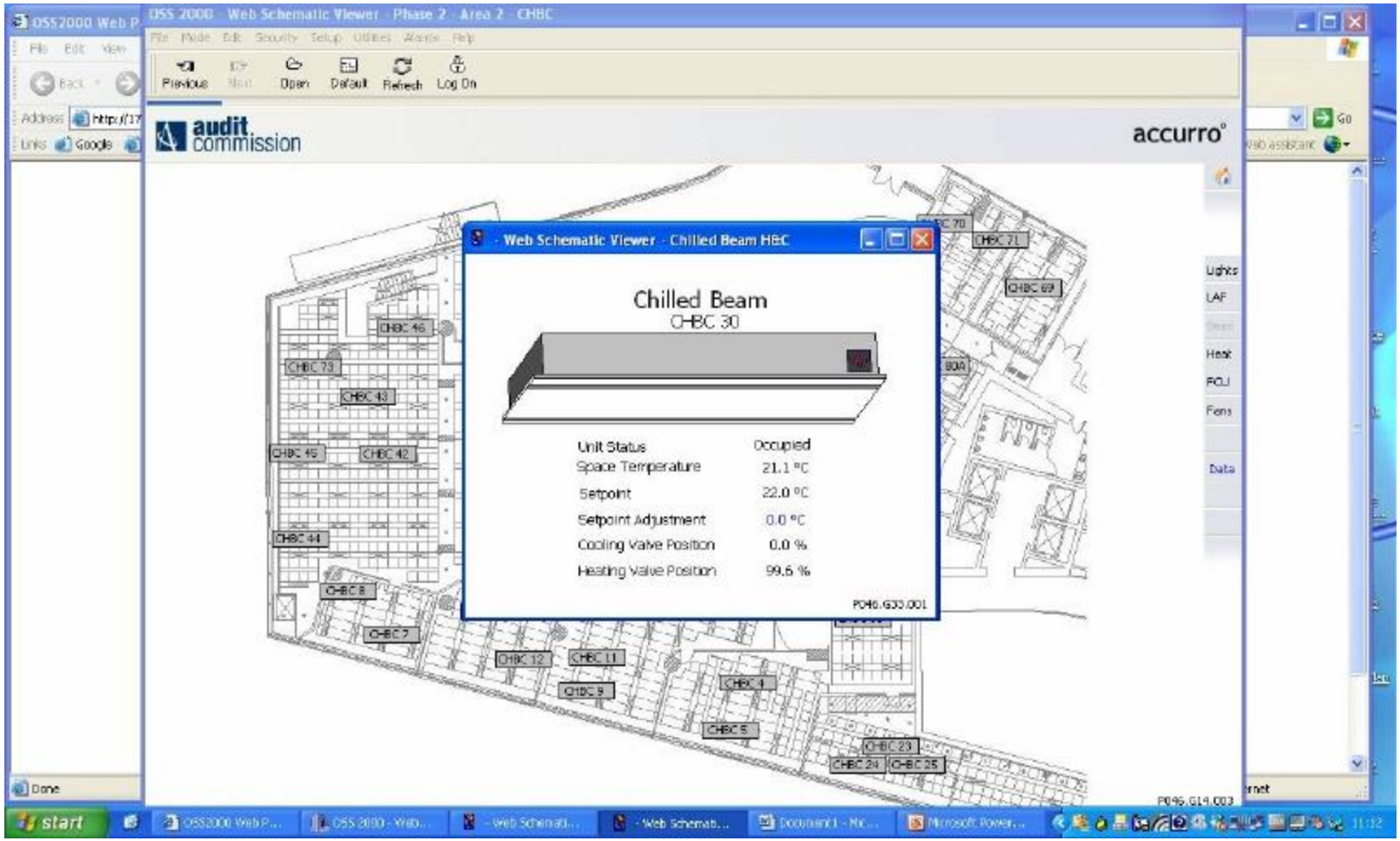
Basic Infrastructure

System Architecture



Multiple Site

The Web Enabled Tenant



Sharing information

- Information from many systems can be viewed through one common window
- Making use of intranet and internet for the control and monitoring of systems and collaboration of information
- Making facility and help desk functions automated through the same management

Why integrate?

New generation of businesses looking for intelligent accommodation to satisfy their business and ethical needs

The new generation of workforces expect better technology and environments which address business and personal issues

New project delivery processes are reducing initial and life cycle costs

Corporate social responsibilty is now a business metric

Organisations and companies spending £bns on vertical and horizontal integration of their business processes

We need to apply same principles to the oft-ignored project design and delivery processes

Barriers to Integration

There is a new generation of businesses looking for intelligent accommodation to satisfy their business and ethical needs – can we deliver?

- **Lack of awareness**
- **Difficult to differentiate between myth and fact**
- **Fragmented way in which buildings are conceived and constructed**
- **Developers tend to be risk averse**
- **Lack of appropriate skills**
- **Appropriate Building Regulations**
- **Appropriate vision for an intelligent community**
- **Appropriate infrastructure**
- **Can we learn from other communities – lessons learned**