NDY
A TETRA TECH COMPANY

MAKING SPACES WORK UTILISING TECHNOLOGY

CITA DIGITAL SKILLS SERIES

12TH NOVEMBER 2024

NDY DUBLIN

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ABOUT US

NDY is an innovative and diverse engineering consultancy, with a commitment to building a better future through excellence in sustainable design.

Established in 1959, we have a long and proud history of offering an extensive range of engineering services and delivering award-winning landmark projects.

We have a global team of 600 Smart Building, Sustainability and Mechanical/Electrical (M&E) engineers. Additionally, as part of our wider High Performance Buildings Group, we have over 2500 engineers working across a variety of sectors, including office, mission critical, retail, hotels and life sciences.

OUR DISCIPLINES

OUR SERVICES

- Smart Building Brief Development
- Smart Building Design Workshops
- Feasibility and concept design
- Engineering design and documentation
- Construction monitoring
- Technical due diligence
- Sustainability strategy, energy strategy
- BER, LEED, BREEAM, WELL, NABERS
- Whole life carbon assessment
- Net zero carbon consulting
- WiredScore
- SmartScore

SMART BUILDINGS

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What if our building could learn, adapt and interact with its occupants?

A Smart Building is about applying technology to optimise the way spaces work.

USER EXPERIENCE

- Enhance occupiers comfort
- Provide premium user experiences
- Increase occupants productivity

SUSTAINABILITY

- Save energy
- Reduce energy expenditures
- Meet sustainability goals: *Net Zero Carbon* and *ESG*

OPERATIONAL EFFECTIVENESS

- Optimise maintenance cost
- Minimise operational risks
- Secured systems and building

SMART BUILDINGS

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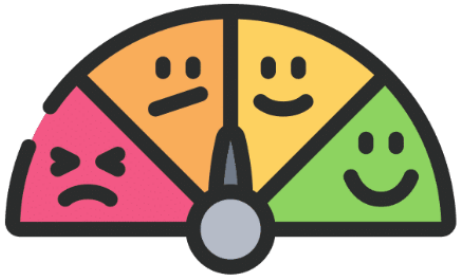
INDUSTRY FACTS & INSIGHTS

USER EXPERIENCE



- Healthier environments = **28% lower absenteeism**
- Quality workspaces show **increase in job satisfaction by 20%**
- Buildings with correct levels of daylight see a **15% decrease in absenteeism**

SUSTAINABILITY

- BMS systems manage **40% of a building's total energy consumption**
- Fault detection diagnostics **save 15–25% in HVAC energy consumption**
- Sustainable features can enhance a property's value

OPERATIONAL

- IoT-enabled waste solutions **reduce cleaning costs by up to 12%**
- Technology can unlock a **29% improvement in space management**
- Fault detection diagnostics typically **reduce maintenance expenditure by 5–15%**

SMART BUILDINGS

INDUSTRY FACTS & INSIGHTS

BUILDING EFFICIENCY CHALLENGES

25-45%

ENERGY WASTED BY HVAC

30-40%

WORKSPACE NOT UTILISED

20-40%

UNSCHEDULED (REACTIVE) MAINTENANCE

Source: Schneider Electric

TYPICAL ANNUAL SPEND FOR AN ORGANISATION

As beneficial as energy savings can be, any green investment that increases employee wellness and productivity can have exponentially greater value.

UTILITIES	€3/FT²	A 2% energy efficiency improvement results in savings of €0.06/ft²
BUILDINGS	€30/FT²	A 2% savings on real estate results in savings of €0.06/ft²
EMPLOYEES	€300/FT	A 2% improvement in occupiers' productivity in savings of €6/ft²

Source: Jones Lang Lasalle

SMART BUILDINGS

THE PROCESS

DESIGN PHASE

- Understand Client Vision - Workshops
- Create a Technology Masterplan
- Input to other design packages
- Develop Smart Building and MSI Specs
- Tender for MSI

CONSTRUCTION PHASE

- Early Engagement with construction team
- Implementation of naming schema
- Correct selection of hardware
- Integration of systems
- Validation

BUILDING IN USE

- Training of FM team
- Dashboard & Report Refinement
- Building Learning
- Building Tuning
- Continuous Improvement

SMART BUILDINGS

BENEFITS

USER EXPERIENCE

😊 **Improved Comfort and Productivity**
To optimise work environments.

📶 **Advanced Connectivity**
To boost operations with IoT and high-speed internet.

🌡️ **Personalised climate control**
For comfort optimisation.

🔑 **Seamless access control**
For hassle-free entry.

SUSTAINABILITY

⚡ **Reduced energy consumption**
Through intelligent lighting and HVAC controls.

💧 **Optimised water usage**
With smart irrigation and monitoring systems.

🌱 **Decreased carbon footprint**
With renewable energy integration and monitoring.

🌬️ **Improved indoor air quality**
Supports occupant health

OPERATIONAL EFFECTIVENESS

📊 **Real-time monitoring**
Of building systems for quicker issue resolution.

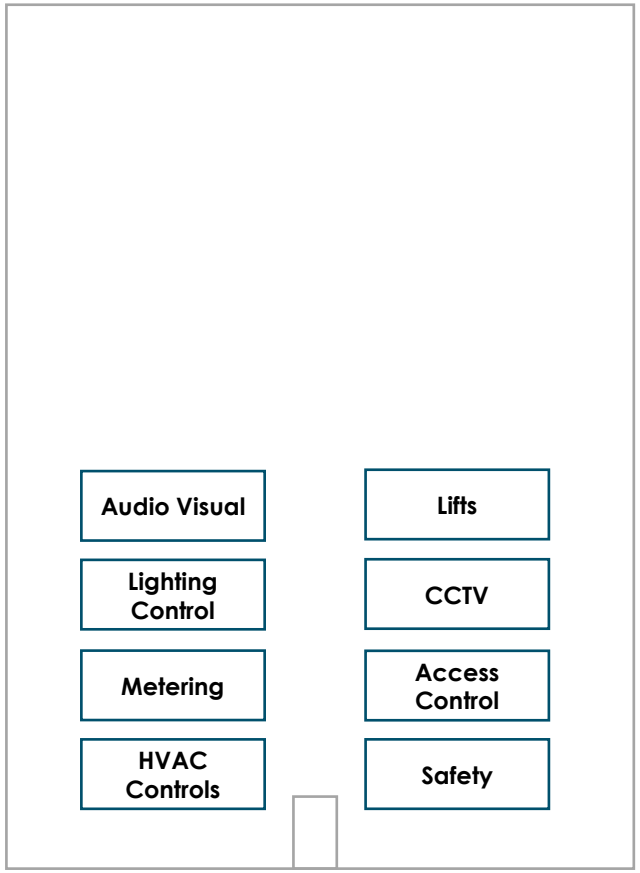
🛠️ **Automated maintenance scheduling**
Reduces downtime and manual intervention.

📈 **Predictive analytics**
Enhance asset management and lifecycle planning.

💡 **Energy usage optimisation**
Cuts operational costs.

SMART BUILDINGS

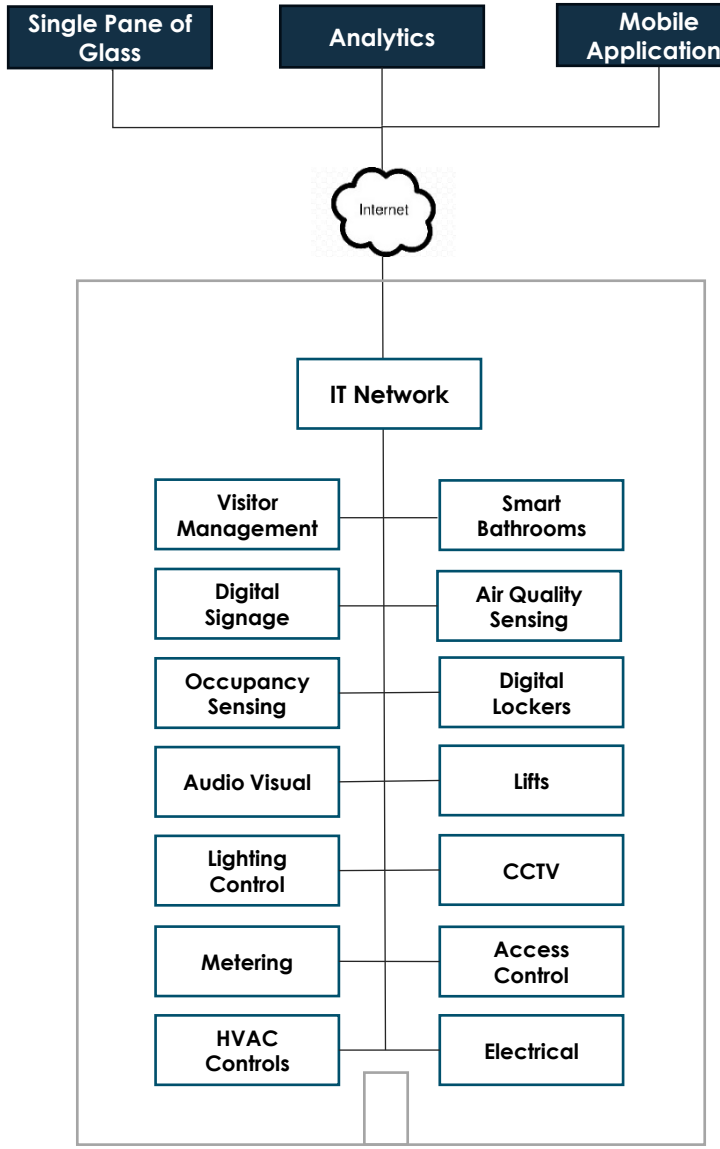
TRADITIONAL VS SMART/CONNECTED



TRADITIONAL BUILDING

Building services control systems installed in a siloed architecture.

Those systems are used independently to each other by a small number of people and the data they generate is often under used and their potential wasted.



SMART BUILDING

Additional technologies are added to the building.

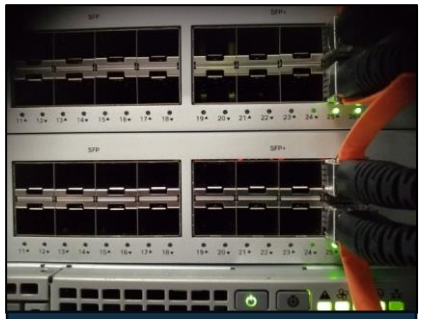
The technologies are open protocol and sit on a secured converged network with a holistic data architecture.

The Smart Building is connected to online applications which analyse and control the data in order to **improve efficiency, sustainability and user experience**

SMART BUILDINGS

IT REQUIREMENTS

Cyber Secure Systems



Converged Networks

IoT Sensor Integration

Data Management

Remote Access / Cloud Hosted

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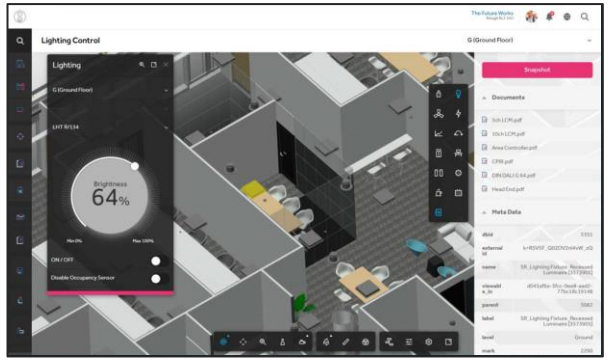
SMART BUILDING PLATFORM



Operational Effectiveness

Digital Twin Management

Maintenance Management

Fault Detection and Diagnostics

Predictive Maintenance and Self-Optimisation

Vibration Analytics

IT Network Management

O&Ms and Documents Hosting

Tenant Help Desk and Work Orders Management

Sustainability

Energy Management

Net Zero, Nabers UK, and ESG Reporting

Utility Bills and Tenant Recharge Management

Water and Grey Water Monitoring

Waste Monitoring

User Experience

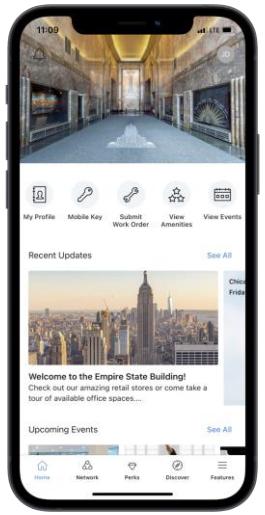
Occupancy and Location Analytics

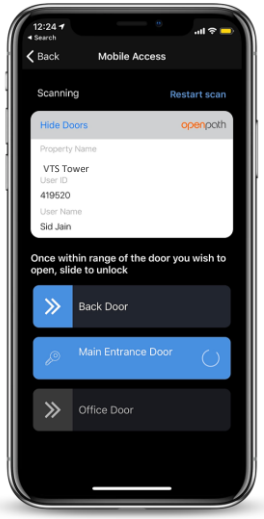
CCTV Video Analytics

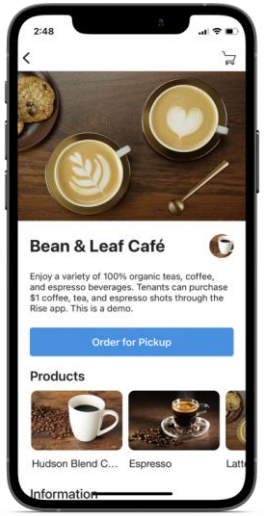
Occupancy-Based Cleaning and Smart Bathroom

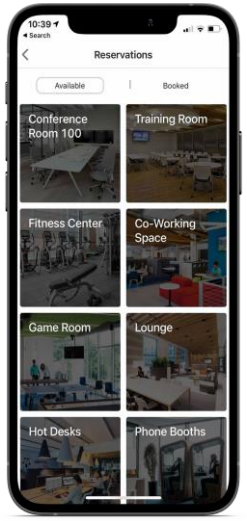
SMART BUILDINGS

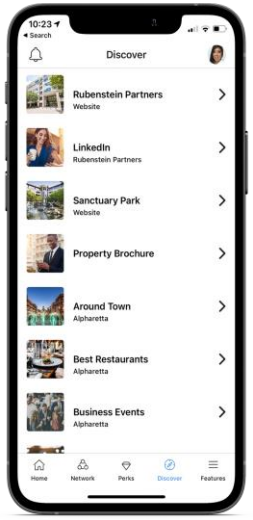
USER EXPERIENCE APP

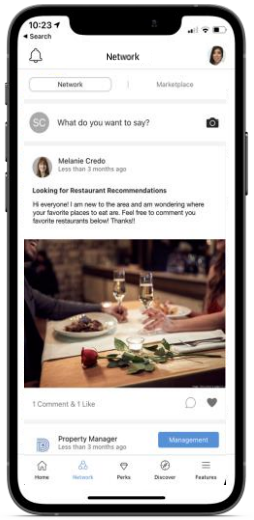












Access, Navigation & Facility Control

Contactless Access Control

Wayfinding and Indoor Localisation

Lift Destination Control

HVAC and Lighting Control

Cycle Parking Availability and Booking

Smart Locker Operation

Interactive Screens and Signage

Services, Engagement and Support

Co-Working and Facility Booking

Visitor Management

Concierge, Live Chat, Fault Reporting and Help Desk

Community Engagement

Delivery Services

Food and Beverages Order and Delivery

Document Management

Monitoring and Sustainability

Energy, Water, and Waste Monitoring

Air Quality Monitoring

Occupancy Monitoring

Gamification of Sustainability Data

SMART BUILDINGS

SMART BUILDING TECHNOLOGIES

BUILDING ANALYTICS & SPOG

ENERGY ANALYTICS & BILLING

AIR QUALITY MONITORING

LIGHTING CONTROL SYSTEM

OCCUPIER EXPERIENCE APP

OCCUPANCY DETECTION

DIGITAL SIGNAGE & KIOSK

SMART BINS

LIFT CONTROL SYSTEM

CARPARK BOOKING SYSTEM

EV CHARGING

SMART BATHROOMS

MOBILE ACCESS CONTROL

VISITOR MANAGEMENT SYSTEM

SMART LOCKERS

VIDEO SURVEILLANCE

ROOM/ DESK BOOKING SYSTEM

ACCESS CONTROL

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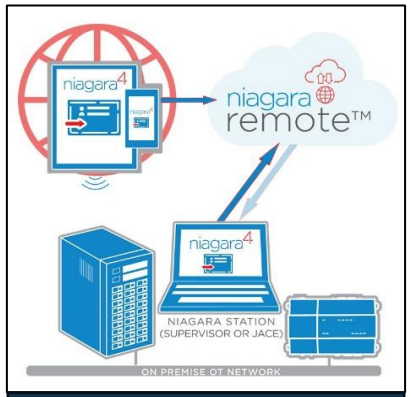
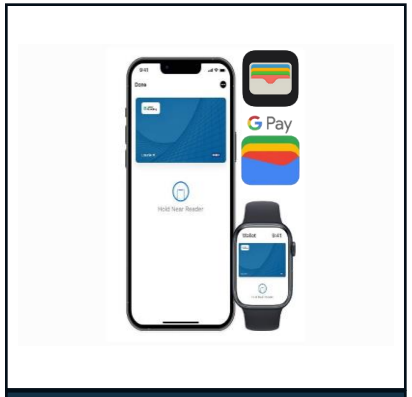
WHAT IS NEXT IN SMART BUILDINGS?

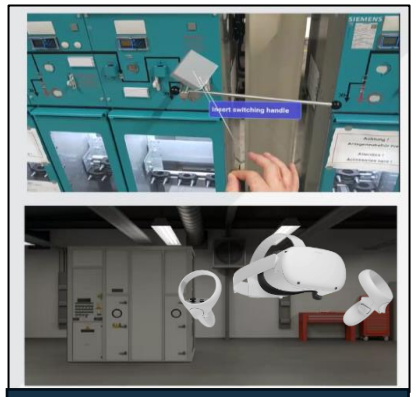
Drone Deliveries



Cloud Based BMS



Mobile Access Credentials



Mixed Reality Training

SMART BUILDINGS

SMALL CHANGES, BIG IMPACT – LESSONS FROM F1

Continuous Improvement

- F1 teams fine-tune every component for optimal performance
- Smart buildings optimise systems for energy efficiency and comfort

Data Driven Decisions

- Real time data guides race strategies in F1
- Sensors and analytics adjust building operations in real time.

Integration of Technologies

- F1 success stems from seamless collaboration among teams and sensors
- Smart buildings integrate various technologies via a central platform

THANK YOU

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