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Integrating Building Performance Standards with Smart Technologies

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A recent whitepaper published by BGIS – Integrating Building Performance Standards with Smart Technologies – shows how the UK built environment is at a pivotal moment. With real estate valued at approximately £17.4 trillion and over £15 billion invested in PropTech between 2023 and 2024, the sector is under mounting pressure to deliver measurable reductions in carbon emissions, improve energy performance, and enhance occupier experience.

Regulatory frameworks, including tightening Minimum Energy Efficiency Standards (MEES), have accelerated the need for data-driven building performance strategies. Yet, despite significant technological progress, many organisations continue to struggle with translating smart system adoption into measurable outcomes.

From Smart Buildings to Measurable Performance

The term “smart building” has evolved from basic environmental automation to a more sophisticated concept one that integrates energy optimisation, user empowerment, demand-side flexibility, and occupant wellbeing. However, technology alone does not define performance. Building Performance Standards (BPS) assess how infrastructure performs against defined criteria, including energy intensity, carbon emissions, indoor environmental quality (IEQ), water consumption, and asset health.

Smart systems and building performance are intrinsically linked. Performance data provides the evidence base, while technology provides the means to capture, normalise, analyse, and act upon that data. Without structured integration across domains such as BMS, EMS, CAFM, IoT sensors, and lifecycle data, organisations risk fragmented insights and suboptimal decision-making.

Technology Architecture as the Enabler

A minimum viable technology architecture must incorporate four essential data layers:

· Core Layer – BMS/EMS telemetry and metering data

· Enrichment Layer – IoT sensory inputs (vibration, temperature, IAQ, acoustics)

· Operational Layer – CAFM/CMMS asset registers, PM schedules, lifecycle data

· Enhancement Layer – Occupancy, lighting control, vertical transport systems

When normalised within a structured data environment, these layers enable advanced analytics such as Fault Detection & Diagnostics (FDD) and supervised machine learning models (e.g., LSTM and novelty detection). The result is early identification of energy spikes, HVAC inefficiencies, asset health degradation, and abnormal operating patterns transforming reactive maintenance into proactive, data-led interventions

Evidence suggests that optimisation of existing control infrastructure alone can reduce Energy Use Intensity (EUI) by up to 26%, demonstrating that performance gains are often

achievable without major capital expenditure provided data integrity and governance are robust.

AI Adoption: Progress with Caution

AI adoption in UK businesses increased from 9% in 2023 to approximately 15% in 2024/25, with significantly higher uptake in large enterprises and start-ups. Within Facilities Management, AI is increasingly applied to:

· Predict abnormal consumption patterns

· Detect HVAC performance deviations

· Generate weighted asset health scores

· Enable Data-Led Maintenance (DLM)

However, AI effectiveness is fundamentally constrained by data quality. Inconsistent taxonomy, siloed systems, poor metering schemas, and unstructured asset registers undermine predictive accuracy. AI is not a substitute for governance; it is an amplifier of the underlying data structure.

Business Readiness and Organisational Alignment

Successful integration requires more than technical deployment. Organisations must undertake structured self-assessment across strategy, asset management planning, IT resilience, data governance, and workforce capability. Clear scope definition, benefit tracking, stakeholder engagement, and a Build vs Buy decision framework are critical to avoid scope creep and cost escalation.

A persistent skills shortage particularly in engineering and digital disciplines continues to impede execution. Without investment in upskilling and reskilling, smart systems risk underutilisation.

The Way Forward

There is clear momentum in the UK market toward building performance optimisation and Net Zero alignment. However, measurable progress depends on moving beyond isolated smart deployments toward structured, standards-led integration. Establishing clear performance metrics across energy, carbon, IEQ, water, sustainability, and asset health supported by robust data architecture and stakeholder alignment will enable organisations to convert digital capability into tangible environmental and financial outcomes.

The convergence of Building Performance Standards and smart technologies is not merely a technological evolution; it represents a fundamental shift in how the built environment is designed, operated, and optimised. Those organisations that prioritise governance, interoperability, and measurable objectives will be best positioned to unlock the full value of intelligent infrastructure.

Read the whitepaper in full here: https://www.bgis.com/uk/news-and-events/integrating-building-performance-standards-with-smart-technologies

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