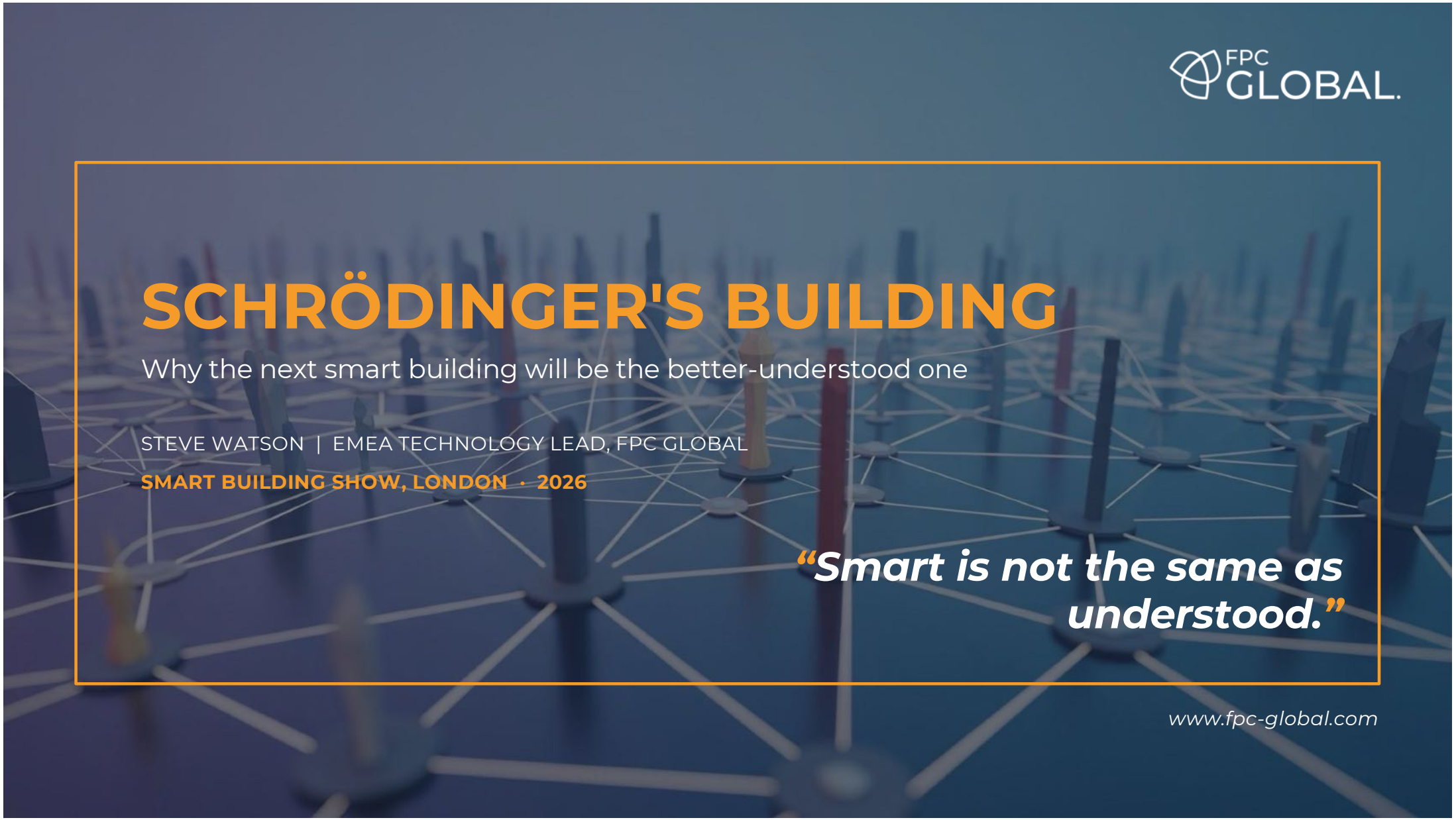

FPC GLOBAL.
SCHRÖDINGER'S BUILDING
Why the next smart building will be the better-understood one
STEVE WATSON | EMEA TECHNOLOGY LEAD, FPC GLOBAL
SMART BUILDING SHOW, LONDON • 2026
"Smart is not the same as understood."
www.fpc-global.com

A Cat, a Box, and an Unseen Building.

01 · The box

The cat is the building

It really is in one state: working as intended, or not. We mostly just don't know which.

The box is what hides it

Everything that prevents us seeing the building's true state. Most of the time, we simply haven't opened it.

AI's first job: open it

Not automation. Not autonomy. The most valuable first job for AI is helping us understand.

> ***For decades we've been getting better at making buildings smart. The next opportunity is to get better at understanding them.***

Much Measured, Little Understood.

02 · Smart is not the same as understood

Simple questions, surprisingly hard answers

- Why did that air handling unit start at three in the morning?
- Why are two near-identical buildings using very different amounts of energy?
- Is the control strategy still running the way it was designed?

The data exists. The answer needs interpretation of...

- the equipment
- what it serves
- how it relates to other systems
- what it was designed to do
- what's been changed since

Collecting information is not the same as developing understanding. A building can be highly instrumented and still poorly understood.

Busy Hands Around an Unopened Box.

02 · How we organise the work

Planned maintenance

Inspects equipment, replaces components and calibrates sensors.

But... Doesn't tell us whether the equipment is behaving sensibly as part of the whole system.

Reactive maintenance

Responds when something fails: an alarm, an investigation, a fix.

But... Doesn't tell us why it happened, what else it affected, or where else it exists.

Monitoring

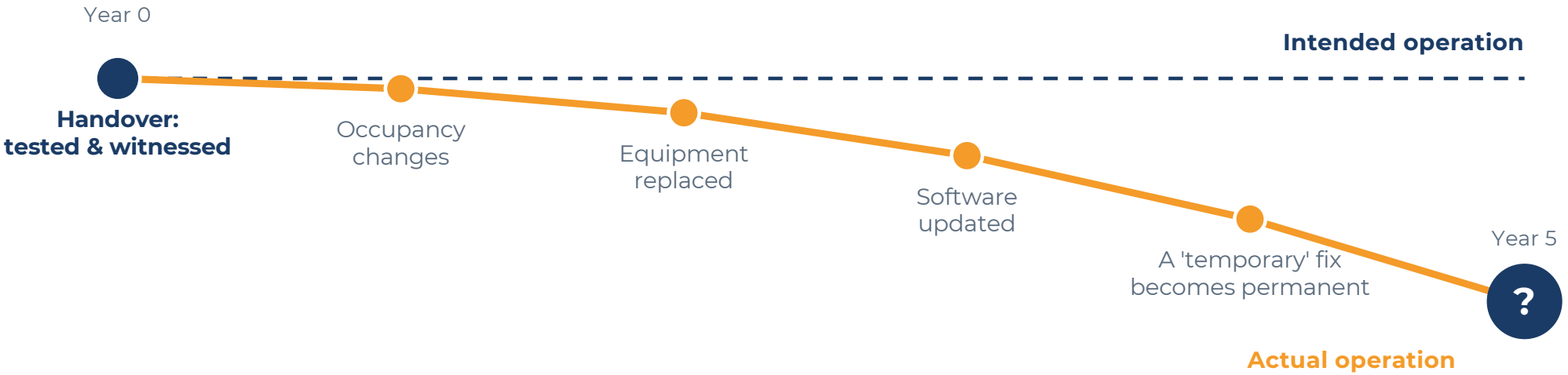
Collects temperatures, pressures, flows, energy and alarms.

But... Telemetry doesn't explain itself.

And when an engineer does build that understanding, where does it go? Their head? A maintenance report? Out of the door when they leave?

The Slow, Silent Slide of Drift.

03 · Five years after handover



THEN WE ASKED

Did it work on the day we handed it over?

NOW WE MUST ASK

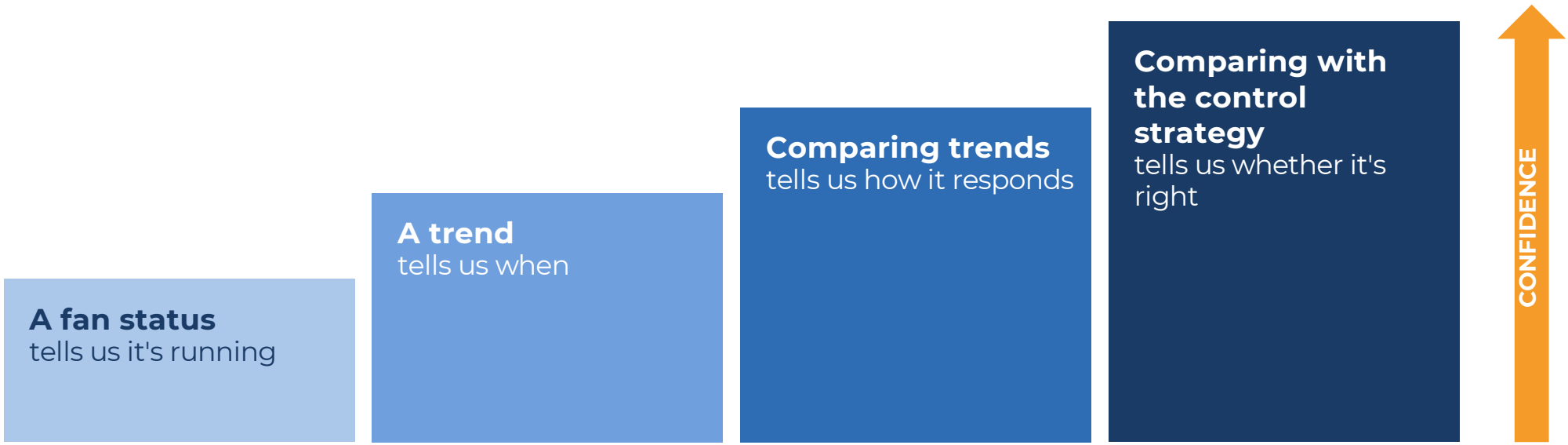
Can we show it's working correctly today?

DRIFT DOESN'T ANNOUNCE ITSELF

The kit runs, the space is comfortable, no critical alarms. Yet energy, design intent and cyber risk may all have slipped.

A Ladder of Looking.

03 · Each level of observation buys a level of confidence



A commissioning test is evidence about the building at commissioning, not a guarantee about it five years later.

A live dashboard tells us what's happening right now, but very little about why, or whether it's correct.

The Curious Case of the Four-Degree Room.

04 · The hot meeting room

"It's too hot in here."

26°C measured

22°C setpoint

We know what the room is doing. We don't know why. And the BMS may have worked perfectly the whole time.

So we dig...

Is cooling being called for? → **Is it actually being delivered?** → **Is enough air reaching the room?**

Real explanations, all seen in practice

- The cooling valve is wide open, but the airflow is too low
- Twelve people in a room designed for six
- The sensor sits on a wall that doesn't represent where people sit

Accurate data is not the same as an accurate explanation.

Of Data, Context, and the Spark Between.

05 · Data, context, reasoning

Data
What's happening

THE OVERNIGHT VALVE

An AHU heating valve is open in the middle of the night. On its own, it tells us almost nothing.

Context
What it relates to

THE OVERNIGHT VALVE

Is there a frost protection sequence? A night setback mode? An override left in place?

Reasoning
How we combine them

THE OVERNIGHT VALVE

Unexpected behaviour, a justified exception, or a genuine problem? Only connecting the pieces tells us.

An anomaly isn't necessarily a fault. Engineers do this reasoning every day, but it's manual, slow, and rarely captured. Can we make it systematic, repeatable and scalable?

A Reasoning Partner in the Plant Room.

06 · AI as a reasoning partner

The engineer asks: ***"Why is this air handling unit running overnight?"***



Question
Asked in plain language

Equipment
Identify the unit and what it serves

Data
Trends, schedules, overrides, recent changes

Intent
Compare with what it's meant to do

Explanation
Offered with the evidence attached

Possible answers

- The schedule changed six months ago
- It's meeting a genuine operational need
- A maintenance override was never removed
- **The evidence isn't enough to say**

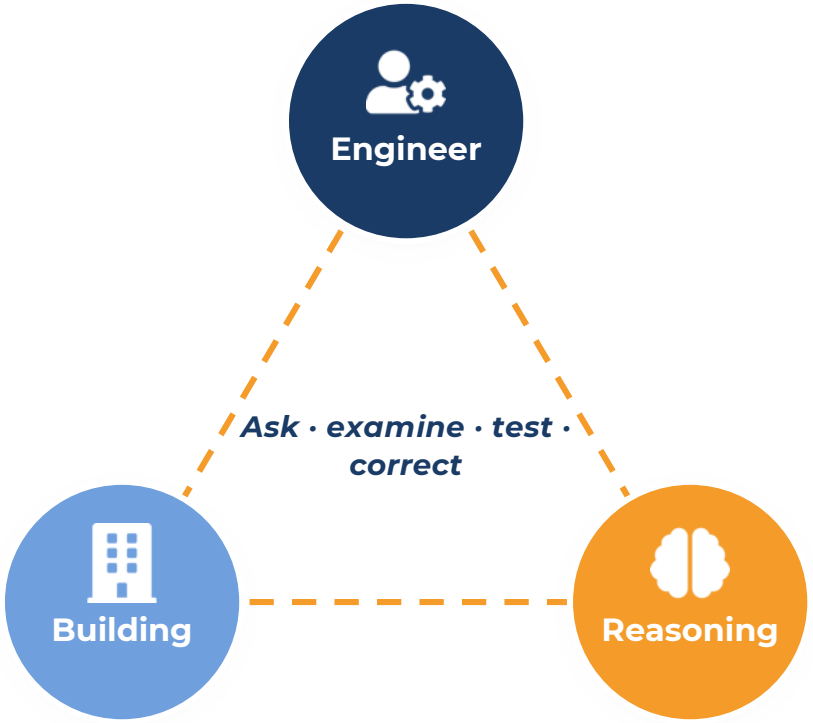
A useful system has to tell us what it doesn't know, separating observations from assumptions, and hypotheses from verified conclusions.

Engineer, Building, and the Loop Between.

06 · Each part brings something the others can't

Operational data	provides observation
Asset model	provides relationships
Documentation	provides intent
Records	provides memory
AI reasoning	**connects them**

No magic. AI doesn't understand a building because we've plugged a language model into a database. It needs reliable, structured context, and its reasoning checked against real evidence.



The engineer stays central: asking, challenging, adding what isn't in the system, and deciding what to do.

Where Does the Knowing Go?

07 · Understanding must survive the individual

The engineer of fifteen years knows...

- which valve behaves oddly
- why a sequence was modified
- which complaints are connected
- which alarms can be ignored

Enormously valuable. Also fragile.

A LOG ENTRY

```
Schedule changed
06:00 → 08:00
```

Tells us what happened. Not why, what evidence supported it, what risks were weighed, or whether it worked.

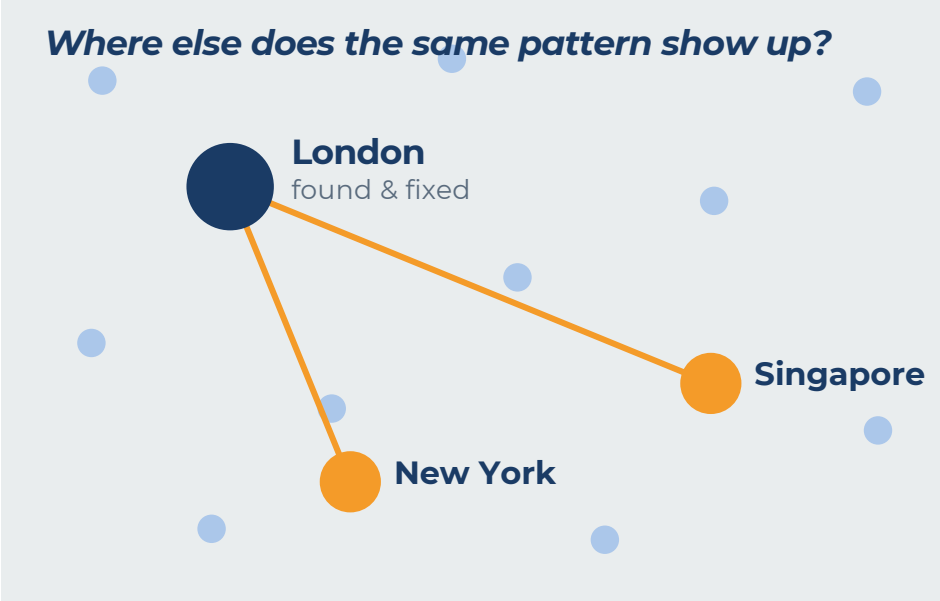
AN OPERATIONAL MEMORY

1 The question
2 The evidence
3 Hypotheses tested
4 The decision
5 The outcome

"Open the box once, and you shouldn't have to open it from scratch again."

From One Mind to Many Buildings.

08 · From the engineer to the organisation



Individual understanding
An engineer working with a building. A human and technical process.

Organisational understanding
Knowledge retained, shared, challenged and applied across many buildings. People, process, knowledge and technology working together.

One caveat: AI can speed up analysis and retrieval, but on its own it can't create a learning organisation. That takes a deliberate change in how we manage operational knowledge.

Opening the Box, Again and Again.

09 · From periodic checks to continuous assurance

PERIODIC CHECKS
Inspection, maintenance, recommissioning. Still essential, but confidence wears away between visits.

CONTINUOUS ASSURANCE
Regularly comparing what the building is doing with what it's meant to do, under the conditions that actually exist.



Why "assurance"? We'll never know everything about a complex building. But we can be far more systematic about what we know, what we don't, and how confident we are.

The Compounding Interest of Understanding.

10 · Rethinking the return

A fault solved in

1 minute

instead of 1 day is

1,440×

better: about three orders of magnitude

Measure these benefits. Don't assume them.

From a one-off saving to an ongoing capability

1. **Faster diagnosis**
   The next engineer doesn't start from scratch. Investigations take hours rather than days.

2. **Drift caught early**
   Problems found before they become energy waste, complaints or risk, with ongoing checks that a fix is still holding.

3. **Better decisions**
   Maintenance and investment based on evidence, not assumption, so we can trust the choices we make.

The return comes not only from what we fix, but from knowing what needs fixing, why it matters, and whether the fix worked.

Better Connected, or Better Understood?

11 · Back to the box

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Look.

No number of sensors or dashboards, by itself, tells us how a building is operating today.

Understand.

Connect information, test explanations, and know how confident we are.

Remember.

Keep what we learn, so the next engineer and the next building start ahead.

"The next generation smart building won't just be the better-connected one.
It'll be the better-understood one."

Want to learn more? Let's talk.



Steve Watson
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Introduce yourself, drop me an email, or say hi to one of my FPC colleagues here today.

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