

University College Dublin
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***Do you know how
the building you designed
is performing?***

Bill Bordass

the Usable Buildings Trust
www.usablebuildings.co.uk

Outline

- 1. Flying blind? What BPE and POE tell us**
 - 2. How might one improve building performance in use**
 - 3. Changing the system in which we find ourselves**
 - 4. Re-defining the role of building professional**
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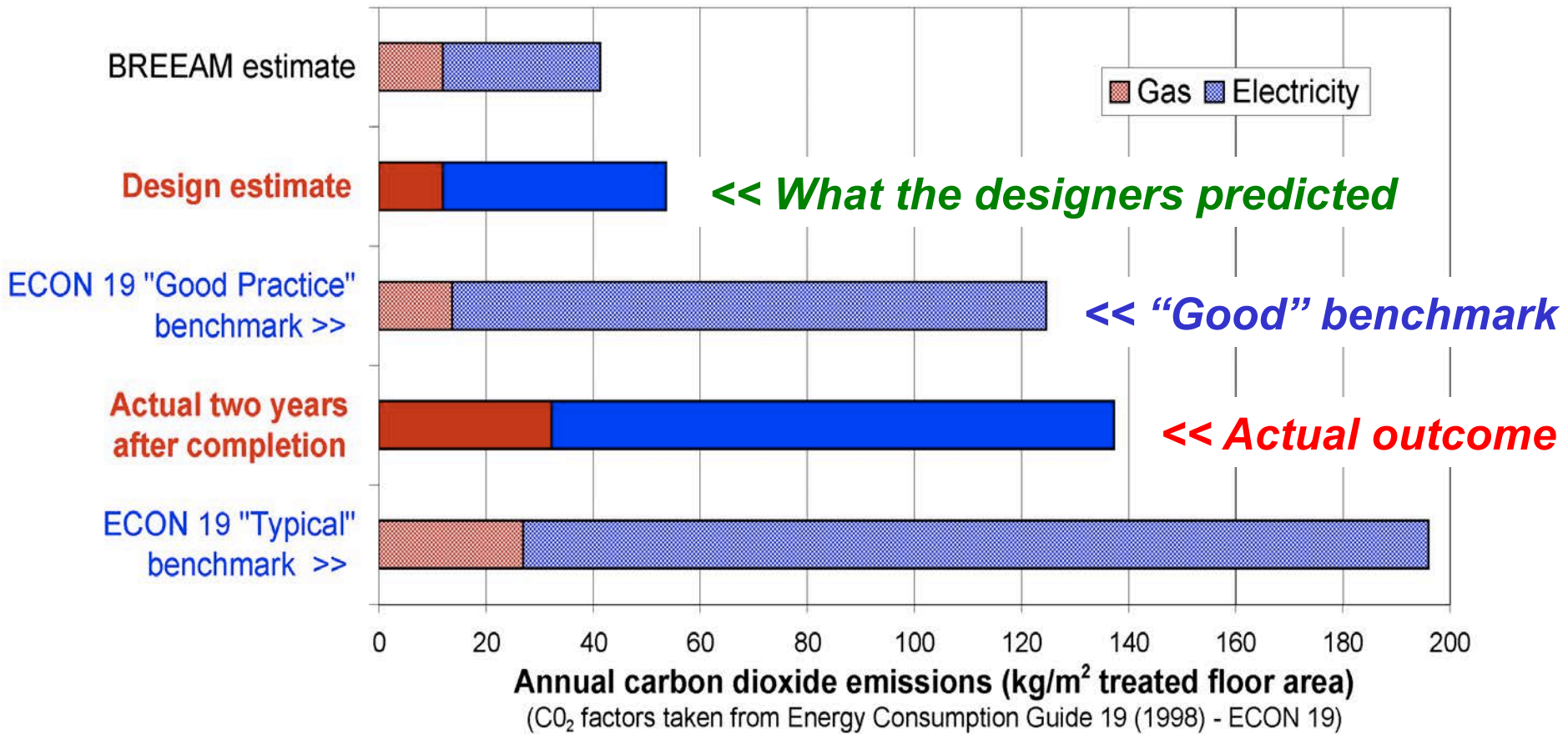
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FLYING BLIND?

What Building Performance Evaluation
and Post-occupancy Evaluation tell us:
the evidence under our noses

The Design-Performance Gap: *The UK couldn't deliver low-energy performance reliably in the 1990s. It is still difficult.*

Data from the winner of the Green Building of the Year Award 1996

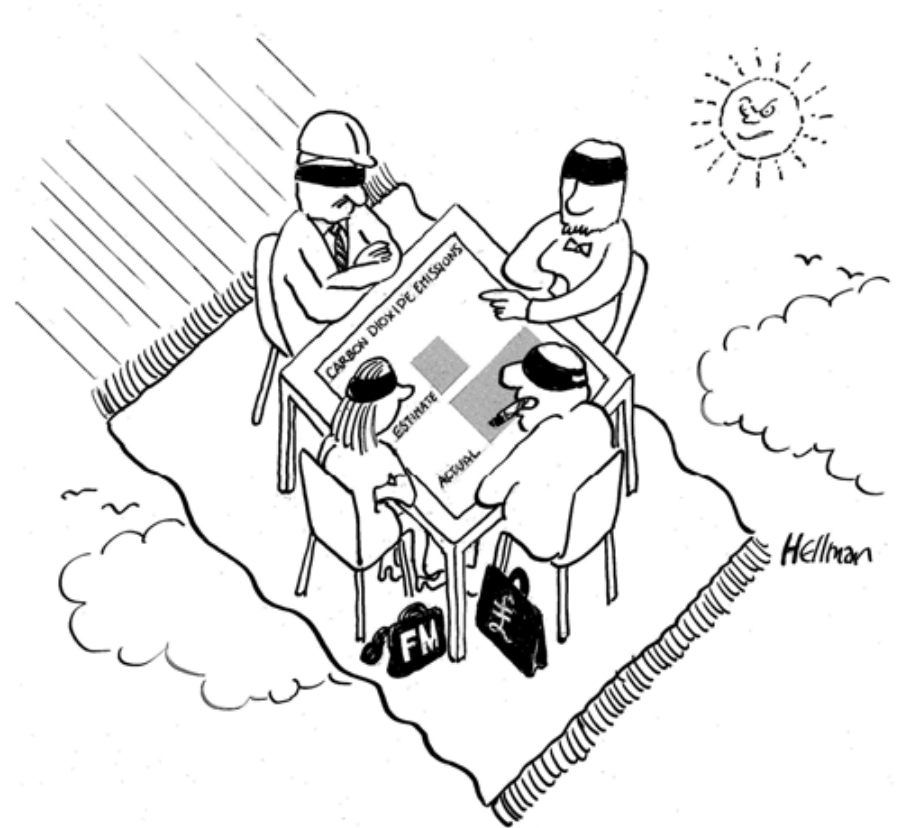


For most of the construction and property industry, *building performance in use is another country ...*

*“in theory, theory and practice
are the same,
in practice they aren’t.”*
SANTA FE INSTITUTE

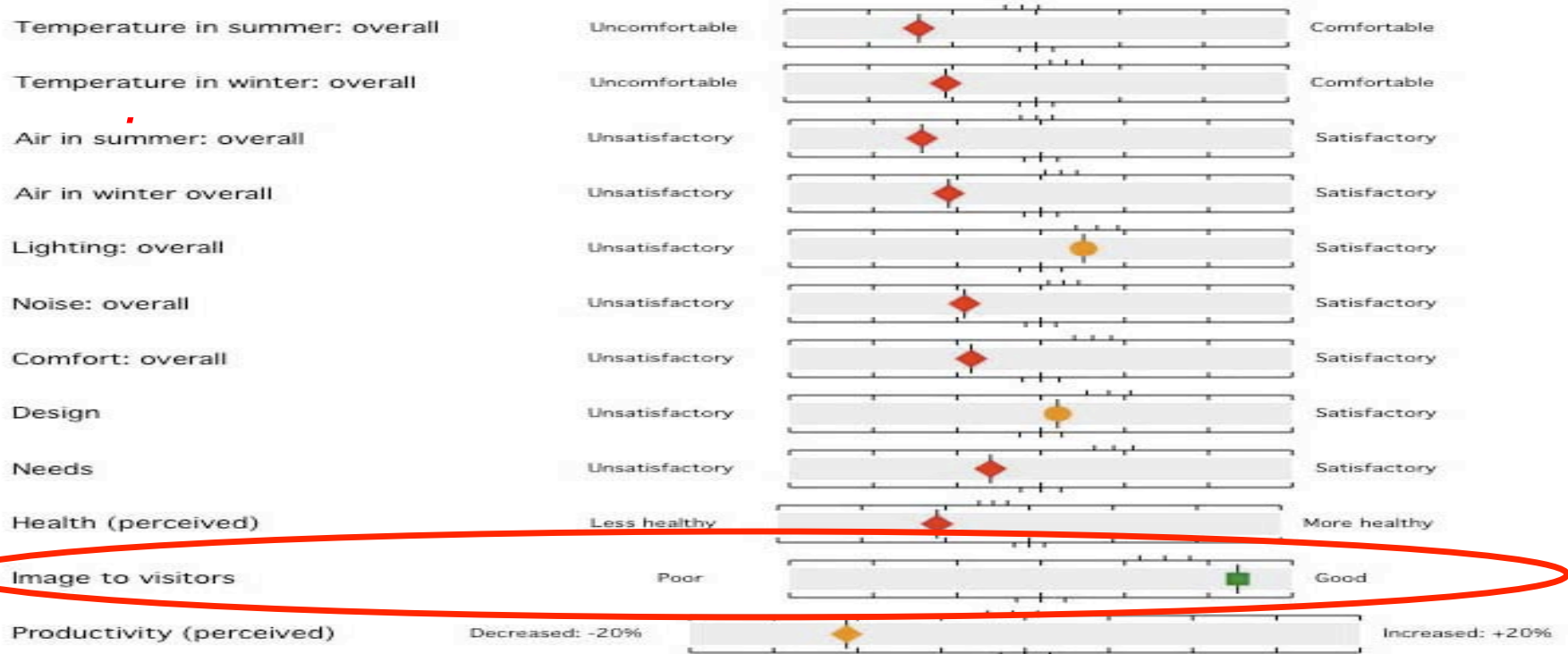
*“designers seldom get feedback,
and only notice problems when
asked to investigate a failure.”*
ALASTAIR BLYTH
CRISP Commission 00/02

*“I’ve seen many low-carbon
designs, but hardly any low-carbon
buildings”*
ANDY SHEPPARD, Arup, 2009



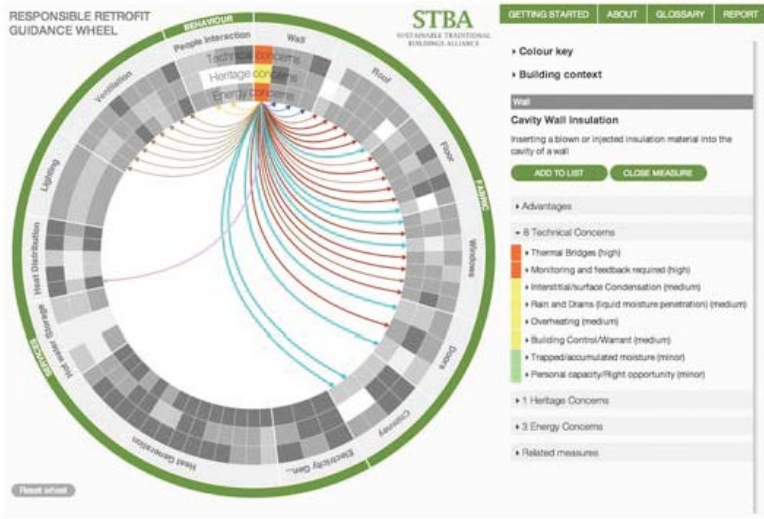
The gaps are not just for energy: occupant survey, multi-award-winning school

RED: below average; AMBER: Average; GREEN: Above average



“ ... the architecture showed next to no sense. It leaked in the rain and was intolerably hot in sunlight. Pretty perhaps, sustainable maybe, but practical it is not.” ... STUDENT

The gaps are not just for new buildings: *Knowledge base for retrofit*



SOME CONCLUSIONS

Industry and policy lack understanding of traditional building performance.

Lack of connection between research intelligence and guidance procedures.

Significant uncertainty in application of models and software.

Some methods used are inappropriate.

A systemic approach is necessary to avoid unintended consequences.

There are good opportunities, but some will need to be developed using a rather different basis and structure.

Why aren't designers and builders better tuned in to outcomes?

- Not what clients or government have asked them to do: *“hand over and walk away” is systemically embedded in standard procedures and contracts, so follow-through is not part of the standard offering.*
 - Clients and government haven't set aside time and money for tuning-up after handover, *and have often preferred to bury any bad news.*
 - The industry and the associated professions didn't fill the vacuum created while central and local government progressively outsourced its technical expertise, research and performance feedback work.
 - The policy emphasis has been on construction, not performance in use, *even when feedback information has been revealing problems.*
 - Rigid divisions between funding of capital and operational costs – *getting worse if anything, in spite of all the talk.*
 - “Post-Occupancy Evaluation” (POE) is a construction industry perspective, with handover the end, not the beginning! *Too often seen as academic and mostly about perceptions.* Hence BPE.
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50 years ago in the UK: RIBA Plan of Work (1963) STAGE M: Feedback

PURPOSE

To analyse the management, construction and performance of the project.

TASKS TO BE DONE

Analysis of job records.

Inspections of completed building.

Studies of building in use.

PEOPLE DIRECTLY INVOLVED

Architect, engineers, QS, contractor, client.

A false dawn: What went wrong?

In 1972:

The seminal book *Building Performance* was published by BPRU, the Building Performance Research Unit at Strathclyde University.

The very same year:

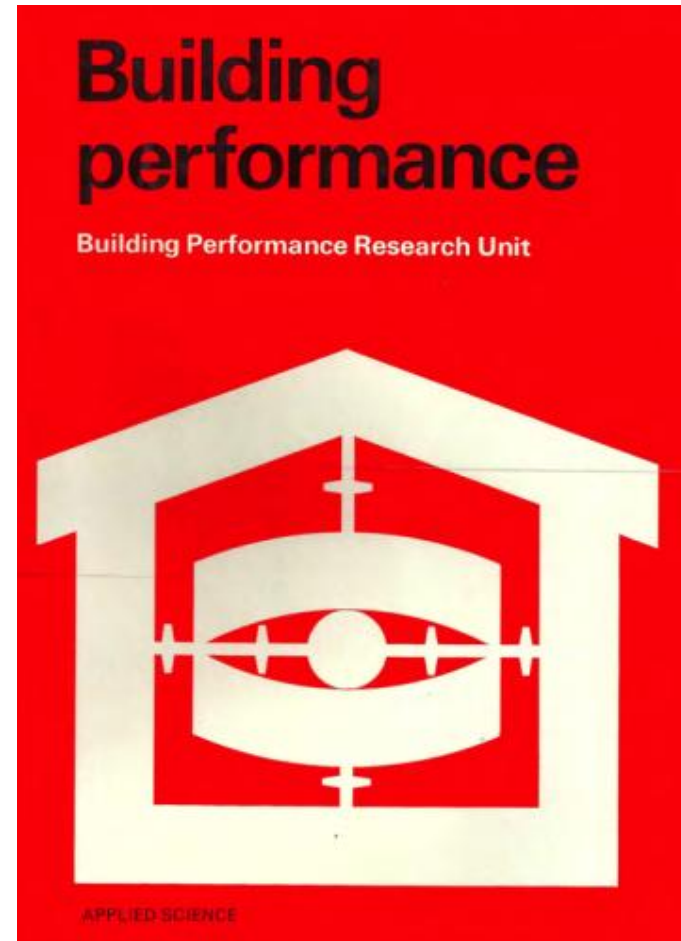
RIBA took STAGE M out of its publication *Architect's Appointment*.

REPORTEDLY BECAUSE:

- *Difficult to define what should be done.*
- *Clients wouldn't pay for it.*
- *RIBA did not want to create the impression architects would do it for nothing.*
- *Concerns about legal and insurance implications.*

FEEDBACK ALSO WITHERED IN ACADEME:

“Unfortunately, interdisciplinary subjects have a way of escaping from any discipline whatever.” ... ERIC DREXLER



Half a century later, it's just come back!

RIBA Plan of Work 2007 and 2013

RIBA Work Stage										
RIBA Plan of Work 2013										
0	1	2	3	4				5	6	7
Strategic Definition	Preparation & Brief	Concept Design	Developed Design	Technical Design				Construction	Handover & Closeout	In Use
RIBA Outline Plan of Work 2007										
A	B	C	D	E	F	G	H	J	K	L
Appraisal	Design Brief	Concept	Design Development	Technical Design	Production Information	Tender Documentation	Tender Action	Mobilisation	Construction to Practical Completion	Post Practical Completion
Preparation		Design			Pre-Construction			Construction		Use

Fig 1. RIBA Plan of Work 2013 compared with RIBA Outline Plan of Work 2007

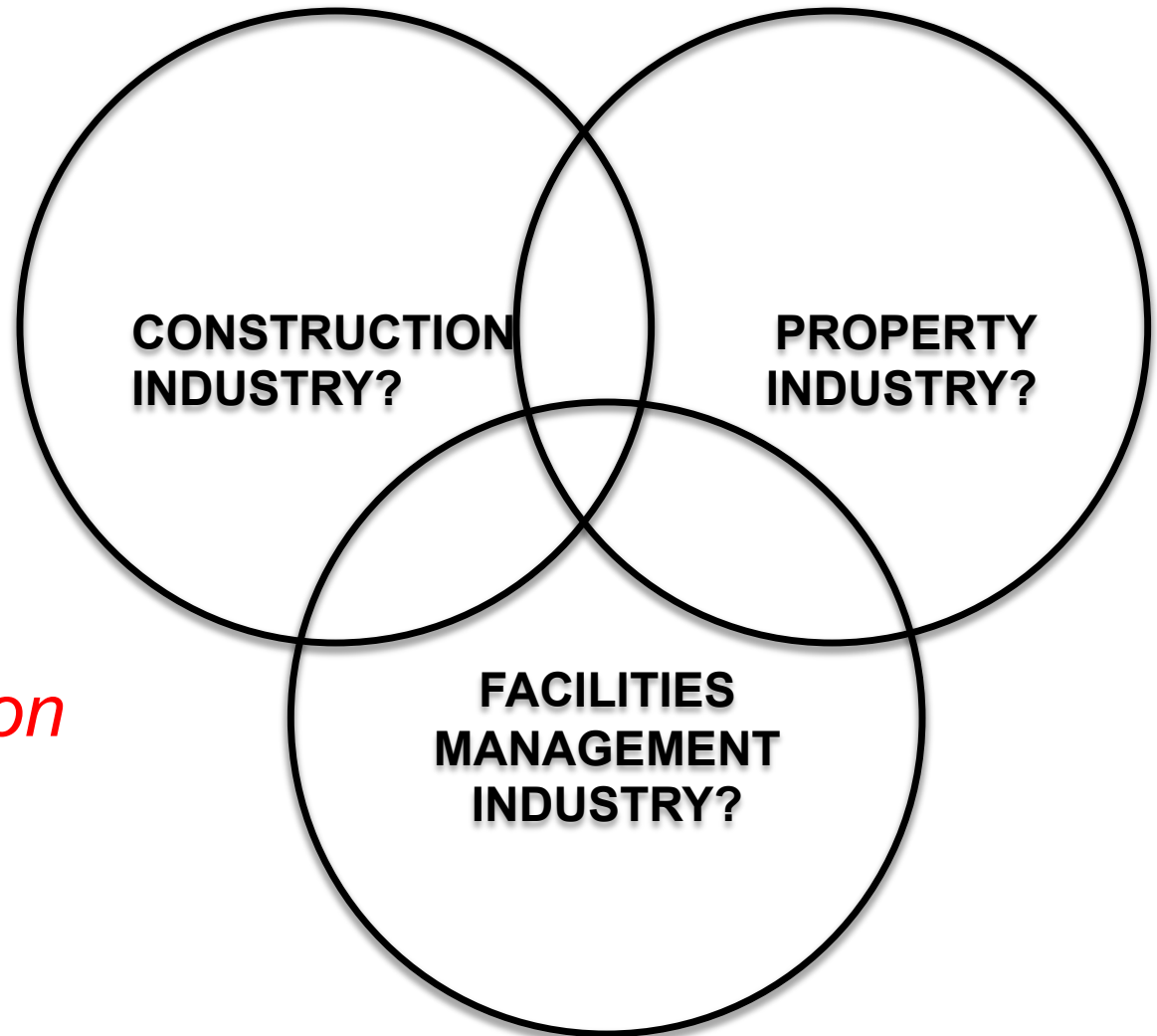
In all your projects, do you follow through from design into operation and feed back the insights?

If not, why not? What's getting in the way?

Which industry and market is really responsible for building performance?

None of these:
it's much more
complicated
than that.

*The lack of traction
is not a market
failure, but a
category error!*



Onto the bonfire? *Are we too concerned with markets and trading, not long-term public interest?*

“Market fundamentalism has taken root in the machinery of government”

JOHN ASHTON, former UK Climate Spokesman (2013)

How do we maintain the chain of progress?

Where are the disinterested professionals?

Where is the public domain infrastructure for improving building performance in use?

2

**HOW MIGHT ONE IMPROVE
BUILDING PERFORMANCE
IN USE**

POE has been around for a long time

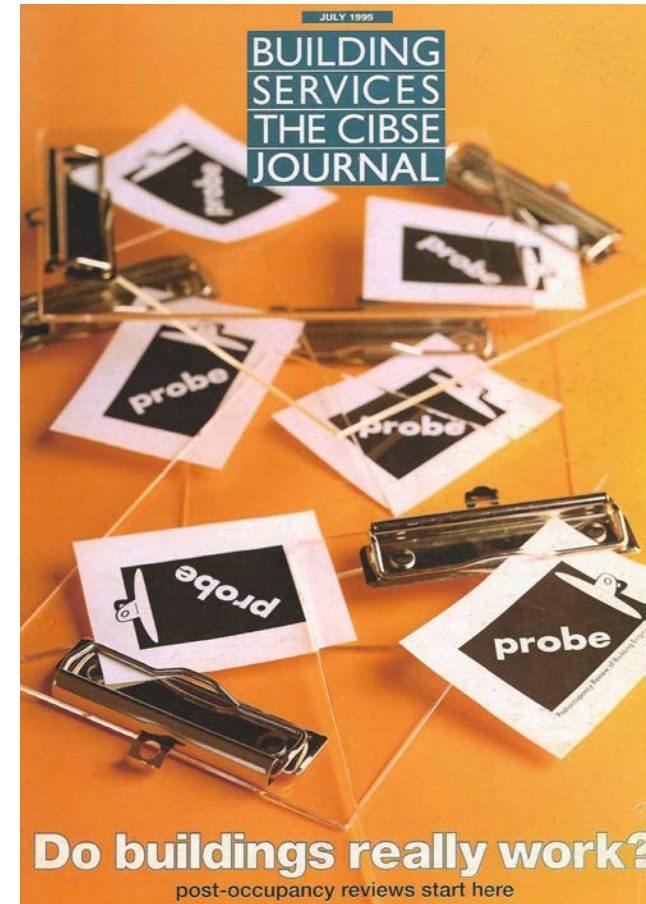
So why hasn't it become routine?

- Often too remote from the delivery process.
So the uninvolved are seen as being wise after the event, while the closely involved don't learn.
 - The supply side detaches at handover
Even the procurement departments of repeat clients.
 - There tends to be more bad news than good.
So blame someone or shoot the messenger!
 - It can be difficult to get problems fixed ...
if everybody is not on board.
 - Everyone benefits, but nobody wants to pay,
and not always seen to be good value for money.
-

New non-domestic buildings:

What have we tended to find, for many years now?

- They often perform much worse than anticipated, *especially for energy and carbon, often for occupants, and with high running costs, and sometimes technical risks.*
- Design intent is seldom communicated well to users and managers. *Designers and builders go away at handover.*
- Unmanageable complication is the enemy of good performance. *So why are we making buildings technically and bureaucratically complicated in the name of sustainability, when we can't get the simple things right?*
- Buildings are seldom tuned-up properly. Controls are a mess. *If we have more to do, what chance do we have?*
- Modern procurement systems make it difficult to pay attention to critical detail. ***A bad idea when promoting innovation.***



**KEEP IT SIMPLE, DO IT WELL, FOLLOW IT THROUGH,
TUNE IT UP, CAPTURE THE FEEDBACK**

You can't tell if you have a good building
... unless you find out how it is working

Elizabeth Fry building has the last laugh

The story of the Elizabeth Fry building (AJ 23.4.98) contains a number of ironies. My favourite is that it didn't even make the shortlist of the Green Building of the Year Award in 1996.

DR ROBERT LOWE

Leeds Metropolitan University



LETTER TO ARCHITECTS' JOURNAL

The good performers don't necessarily impress the judges

It's the practice, not just the product

Factors for success at the Elizabeth Fry Building, UEA

- A good client.
- A good brief.
- A good team *(worked together before on the site).*
- Specialist support *(e.g. on insulation and airtightness).*
- A good, robust design, efficiently serviced *(mostly).*
- Enough time and money *(but to a normal budget).*
- An appropriate specification *(and not too clever).*
- An interested contractor *(with a traditional contract).*
- Well-built *(attention to detail, but still room for improvement).*
- Well controlled *(but only eventually, after monitoring and refit).*
- Post-handover support *(triggered by independent monitoring).*
- Management vigilance *(which has been largely sustained).*

But only its technical features were mentioned when a Royal Commission used it as an exemplar

But the messages have had little impact: *complication has burgeoned in recent years*

- Technical complication
- Legislative complication
- Contractual complication
- Bureaucratic complication
- Tick-box procedures: feature creep
- Complication for building users and managers

So less money to spend on basics

The complication disease has now spread to housing too!

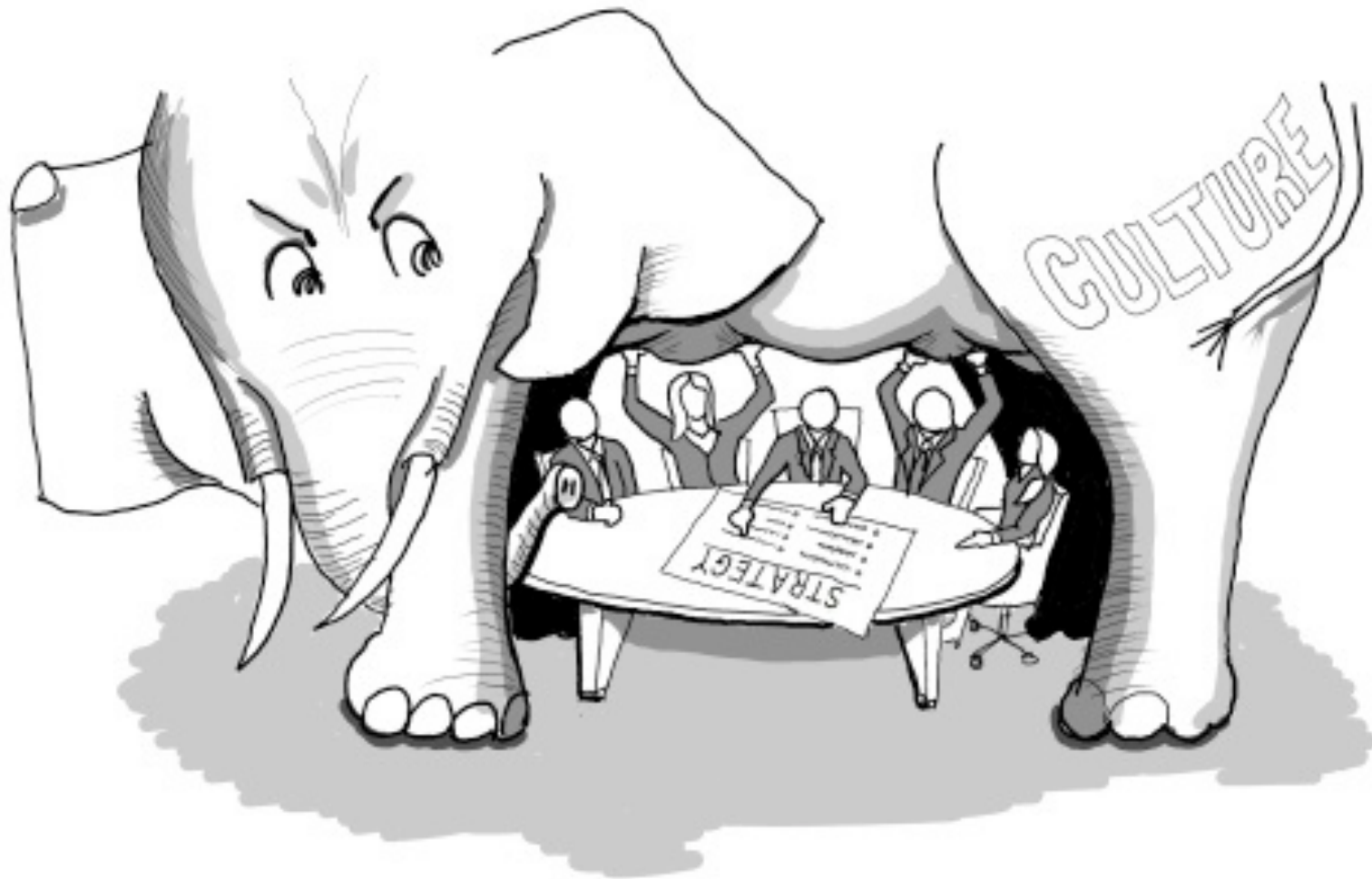
AND NOTHING JOINS UP PROPERLY!

“Complexity is profitable, [it] makes people believe you understand it.”

JON DANIELSSON

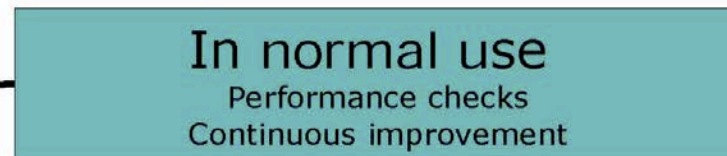


The elephant isn't in the room,
IT IS THE ROOM!

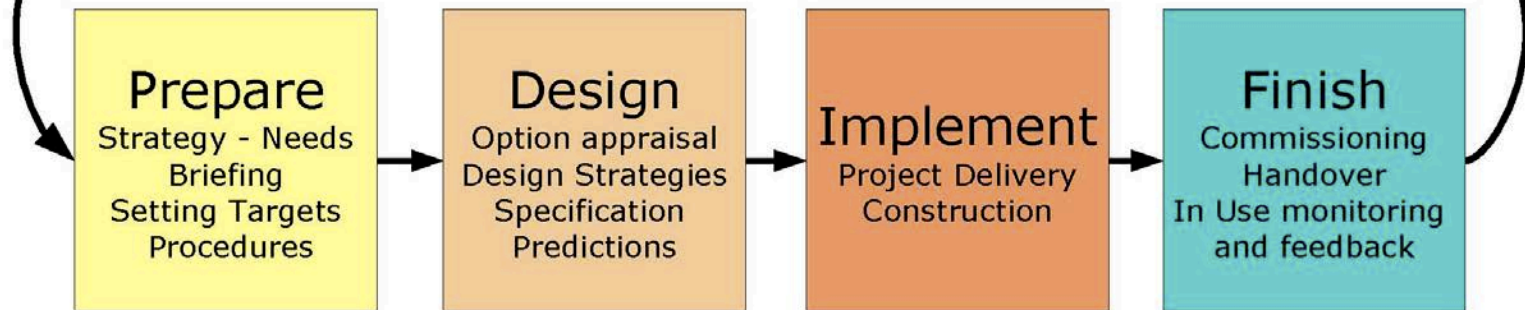


Closing the loop, making follow-through feedback and learning routine

A) Current Assets – Existing buildings in use



B) Future Assets – Buildings or alterations from inception to initial use



You can review performance in use any stage

FORESIGHT: Before you do something new (*existing situation and analogues*)

INSIGHT: At any time (*reality checking, managing expectations*)

HINDSIGHT: After you've completed a project (*learning and fine tuning*)

Getting more sense into procurement

Soft Landings can help

1. **Inception and Briefing**
*Appropriate processes, better relationships.
Assigned responsibilities, including client.
Well-informed targets related to outcomes.*
2. **Design and construction**
Including expectations management.
3. **Preparation for handover**
Better operational readiness.
4. **Initial aftercare**
*Information, troubleshooting, liaison,
fine tuning, training.*
5. **Longer-term aftercare**
*monitoring, review, independent POE, feedback
and feedforward.*

Can run alongside any construction process

It has proved important to bring out the Champions, leaders who can maintain the focus on outcomes and the “golden thread” from design intent to reality.

The most difficult things are post-handover: finding the budget, and changing contractor attitudes.



the **SOFT LANDINGS FRAMEWORK**

for better briefing, design, handover and building performance in-use



Soft Landings: *Everybody can win*

- Better communication, proper expectations management, *fewer nasty surprises*.
- More effective building readiness. *Less rework*.
- Natural route for feedback and Post-occupancy evaluation, *to improve the product and its performance in use*.
- Teams can develop reputations for customer service and performance delivery, *building relationships, retaining customers, commercial advantage*.
- Vital for rapid progress towards more sustainable, low-energy, low-carbon, well-liked buildings and refurbishments, *closing the credibility gaps*.

SO WHAT IS STOPPING US?

- **ATTITUDES:** *Everybody needs to be committed, starting with the client - perhaps the biggest obstacle. The “golden thread” needs to be put in place.*
 - **PROCESSES:** *There is a learning curve to pay for (probably best from marketing budgets), and the feedback has to be managed.*
 - **TECHNIQUES:** *Independent POE surveys cost money (but not much).*
 - **CAPACITY:** *We need facilitators, investigators, troubleshooters and fixers.*
 - **MONEY:** *Particularly allocation for tune-up etc. after practical completion.*
 - **IMAGINATION:** *Often constrained by burgeoning bureaucracy!*
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3

CHANGING THE SYSTEM IN WHICH WE FIND OURSELVES

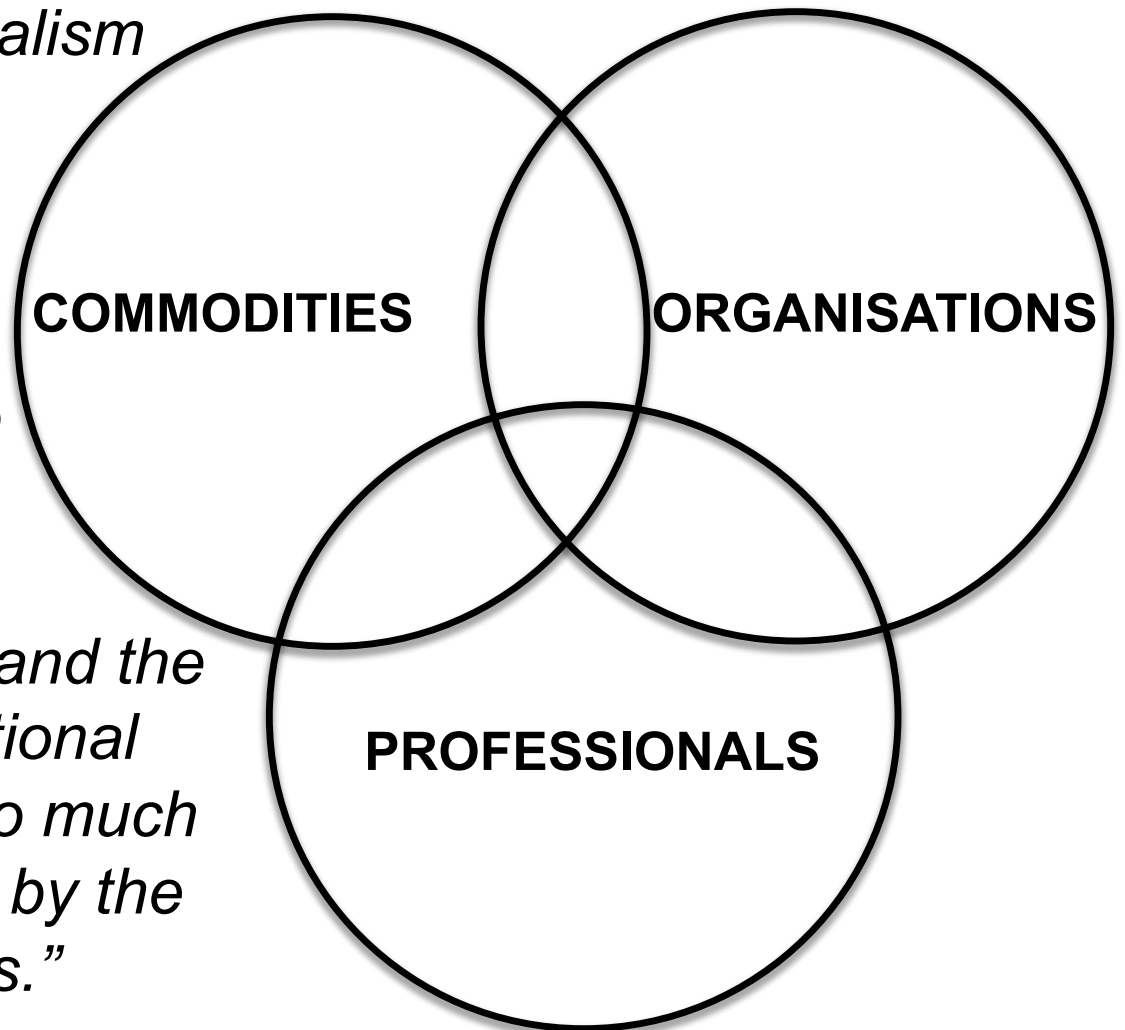
How societies structure expertise

“At present, professionalism seems to hold its own.

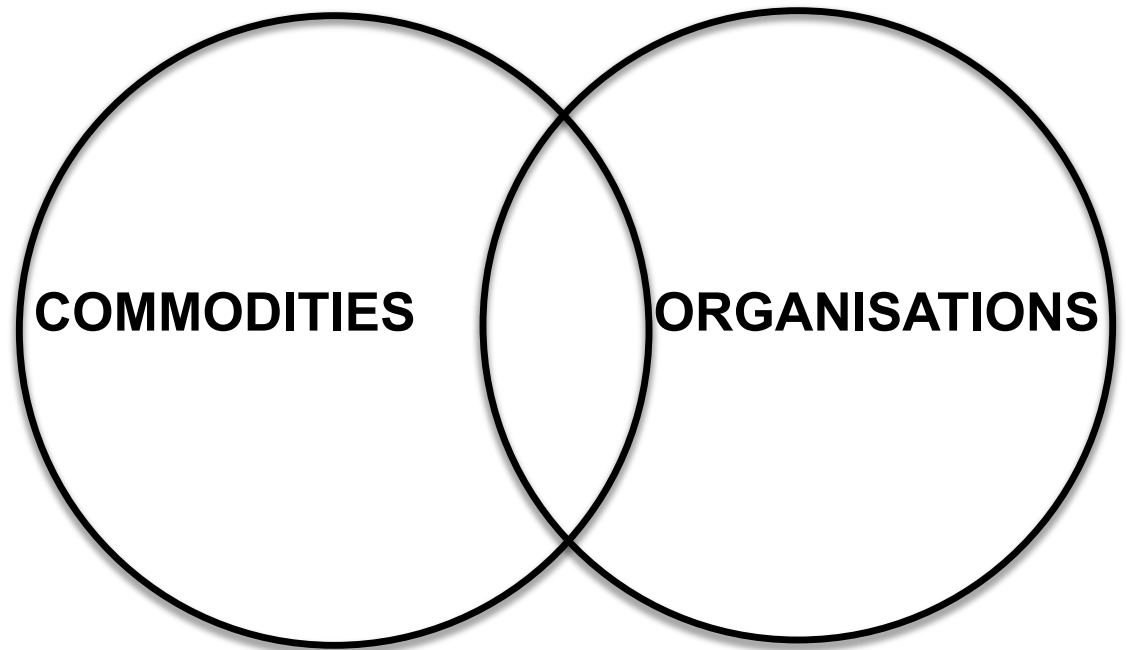
It has stayed ahead of commodification ... but may ultimately lose out to organisations ...

new hiring patterns ... and the loose form of organisational professionalism point to much weaker control of work by the professions themselves.”

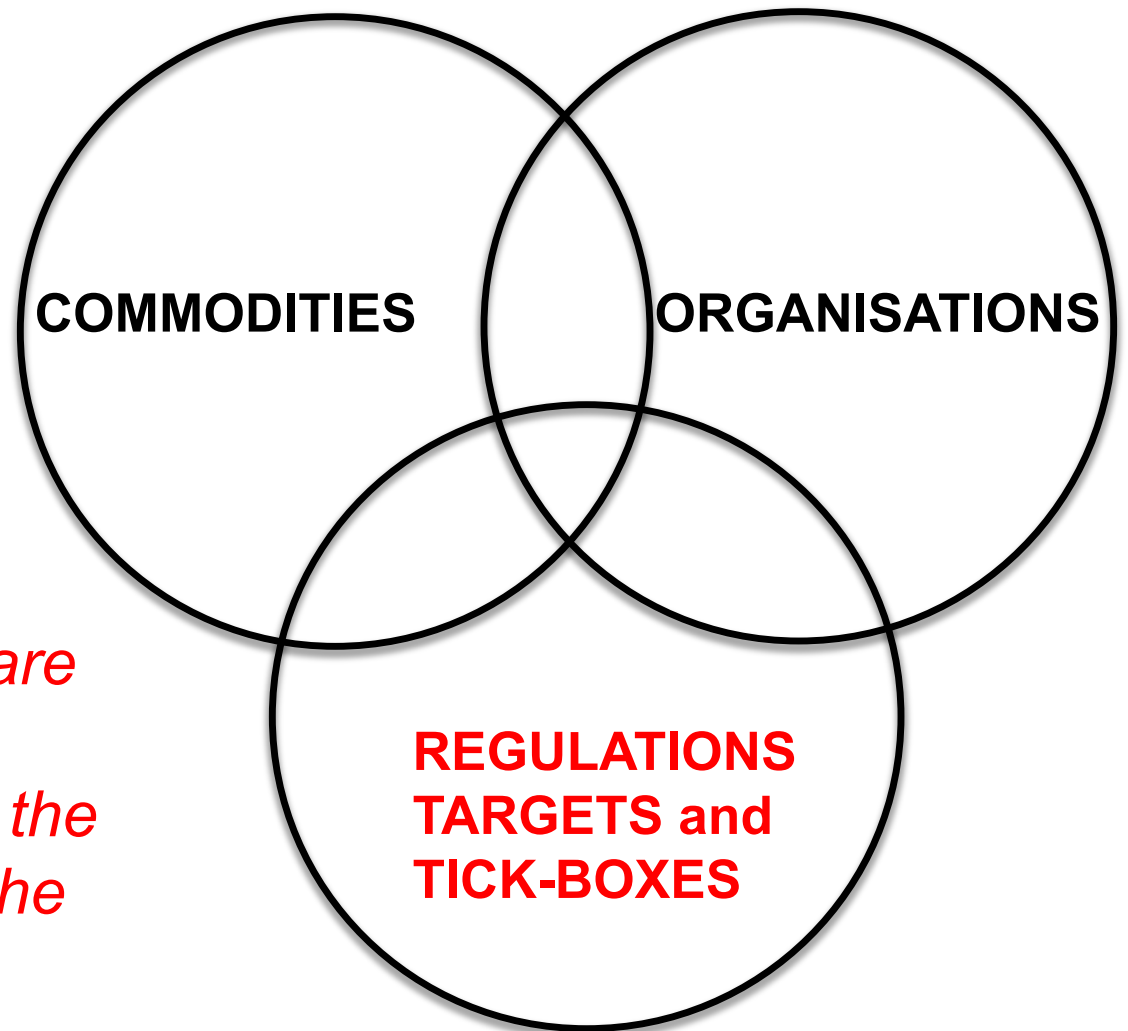
ABBOTT (1988)



Where the UK seems to be now ...



... or perhaps



But do the regulators understand what they are doing? With so much outsourced, where are the vision, the integration the public interest, and the “intelligent customer”?

Is this really enough?

- How do you take proper account of context?
This is where professionalism comes in and artificial intelligence has been struggling.
 - Caring is not something you can reduce to rational procedures and rule systems. It needs ethics,
as we have been seeing recently in many other sectors.
 - You can't predict everything in complex systems,
there will always be unexpected consequences.
 - You can't legislate for innovation,
and innovation in buildings is not just technical.
 - **Big myths and category errors result, and the processes can become the disease they hoped to cure.**
-

“In theory, theory and practice are the same, in practice, they aren’t” ... SANTA FE INSITUTE

THEORY

KNOWN

UNKNOWN

<p>CODIFY <i>Standards</i></p>	<p>EXPLORE <i>Research and Feedback</i></p>
<p><i>Procedures</i> IMPLEMENT</p>	<p><i>Experience and Tacit knowledge</i> JUDGE</p>

<< Technical

PRACTICE

Professional >>



“I’d rather be vaguely right than precisely wrong” ... J MAYNARD KEYNES

THEORY

KNOWN

<p>CODIFY <i>Standards</i></p>	<p>INNOVATE <i>Workshops, Sandpits Magic bullets, Apps.</i></p>
<p><i>Procedures</i> IMPLEMENT</p>	<p><i>Bureaucracy, KPIs Misinformation</i> TARGET</p>

SURMISED

<< Technical

PRACTICE

Managerial >>



UBT's proposed **sticky interventions**: *seeding things with potential to snowball over time*

Cultural adaptations, not just technical “solutions”

1. MAKE IN-USE PERFORMANCE CLEARLY VISIBLE

In ways that motivate people to strive to improve it.

2. REVIEW PROFESSIONAL ETHICS and PRACTICES

Appeal to individual building-related professionals to work in the public interest and engage properly with outcomes.

3. CONSOLIDATE THE KNOWLEDGE DOMAIN

Develop building performance as an independent knowledge domain, with the authority to inform practice and policymaking.

4

RE-DEFINING THE ROLE OF THE BUILDING PROFESSIONAL

Sustainability raises complex moral and ethical dilemmas

- Work ‘after us’ and for ‘the other’.
- Intergenerational equity.
- Deferred impacts over long periods.
- Differential geographical and social impacts.
- High levels of uncertainty and unpredictability.



It needs vision, imagination, reflection and commitment

“[it] does not tempt us to be less moral than we might otherwise be; it invites us to be more moral than we could ever have imagined.” ... MALCOLM BULL

The role of the building professional needs re-defining

- There's a big job to do, *in making new and existing buildings more sustainable.*
 - We're short of money:
we can't afford to spend it on the wrong things.
 - Current procurement systems are not fit for purpose:
we need to do things very differently.
 - We can't change everything tomorrow ...
but we can change our attitudes to what we do.
 - It's not a question of whether we can afford to do it:
We can't afford not to !
 - WHEN DO WE START?
TODAY. *We can't wait until 2050!*
-

Changing the way we do things

- Many construction-related institutions require their members to understand and practice sustainable development.
- How can members do this unless they understand the consequences of their actions? *The real outcomes.*
- If they don't, they are working outside their region of competence ...
- **or in other words, not acting in a fit manner for a professional !**

SO HOW ABOUT?

- Changing attitudes to the nature of the job.
 - Re-defining perceptions of the professional's role, to follow-through properly and to engage with outcomes.
 - Closing the feedback loop – rapidly and efficiently.
 - Making much more immediate, direct and effective links between research, practice and policymaking.
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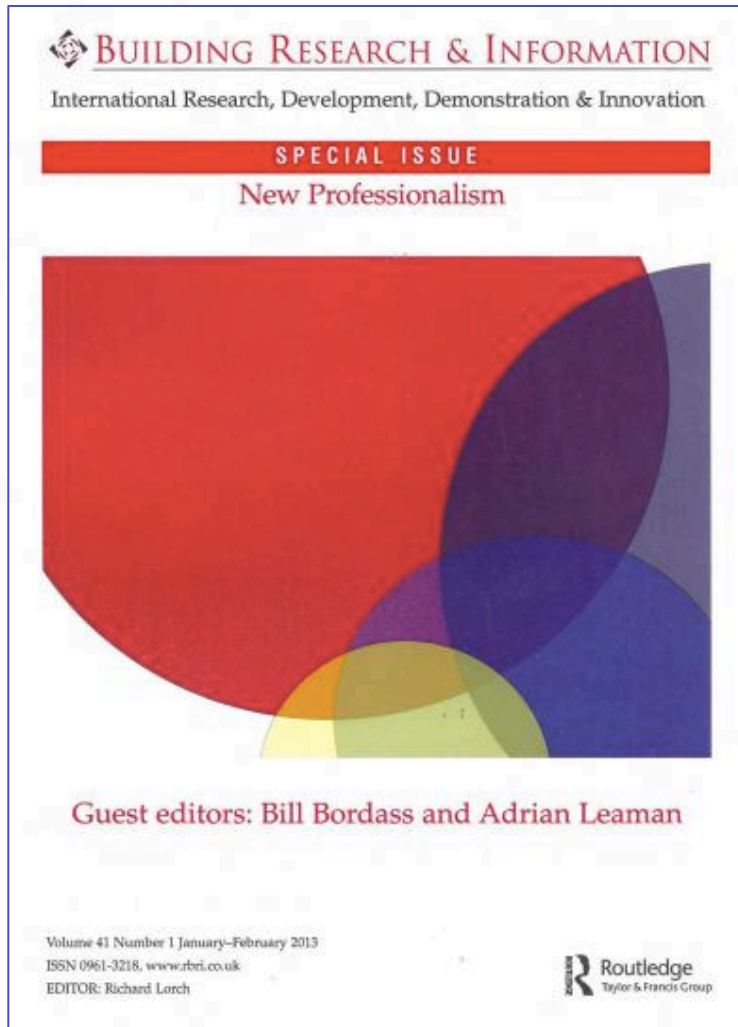
Evaluation into action:

What teams can do with BPE information

- **Improve the performance of the building in use:**
Nearly always possible, but needs motivation, from occupiers too.
 - **Improve the goods and services of those who provided it.**
Always possible. Needs connection, motivation, and organisational knowledge management; and of course paying for!
 - **Improve their procurement and delivery processes.**
e.g. using Soft Landings procedures.
 - **Learn personally from the experience**
Nothing has greater impact than first hand exposure.
 - **Contribute to the wider knowledge base,**
In the past, BPE information was often not well communicated, or regarded as anecdotal, so people didn't take the lessons to heart.
 - **Save money by spending on the things that really make a difference**
 - **Build relationships, retain customers, build reputations**
Leading firms have often used marketing budgets to get started.
-

New Professionalism: getting started

Principles anyone can adopt tomorrow



PROVISIONAL LIST DEVELOPED WITH THE EDGE ***ETHICS AND BEHAVIOUR:***

1. Be a steward of the community, its resources, and the planet. Take a broad view.
2. Do the right thing, beyond your obligation to whoever pays your fee.
3. Develop trusting relationships, with open and honest collaboration.

ENGAGEMENT WITH OUTCOMES:

4. Bridge between design, project implementation, and use. Concentrate on the outcomes.
5. Don't walk away.
Provide follow-through and aftercare.
6. Evaluate and reflect upon the performance in use of your work. Feed back the findings.
7. Learn from your actions and admit your mistakes. Share your understanding openly.

THE WIDER CONTEXT:

8. Seek to bring together practice, industry, education, research and policymaking.
9. Challenge assumptions and standards. Be honest about what you don't know.
10. Understand contexts and constraints. Create lasting value. Keep options open for the future.

And what is this the antidote to?

The new (or old?) big corporatism

1. Pretend to be a steward of the community and the planet,
but always put your own and your organisation's interests first.
 2. Trumpet your ethics, *but always work strictly within the terms of your appointment and never question its appropriateness.*
 3. Base relationships on roles and contracts, never on trust.
 4. Focus strictly on your own areas of activity.
Transfer responsibilities onto others where possible.
 5. Terminate your involvement as soon as the work ceases to be profitable.
 6. Do not share knowledge with others.
 7. Never admit mistakes.
 8. Resist collaboration.
 9. Always work to existing norms and standards.
Never reveal what you don't know.
 10. Extend your control as widely as possible.
Dependencies create future income streams.
-

Conclusions

- If we are to meet the challenges of sustainability, the role of the building professional must change.
 - We need to be concerned not just with inputs and outputs, but in-use outcomes.
 - We need to follow-through, reflect, close the feedback loop and initiate virtuous circles.
 - This all needs leadership, *not more rules and processes.*
 - Building performance in use needs to become an independent knowledge domain, properly resourced in the public interest. *It's too important to leave to the construction industry!*
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SUMMARY: *New professionals follow design intent through into reality*

- They understand what is needed *strategic briefing*
- Are clear what they want, and communicate it plainly *strategic design*
- Are ambitious, but realistic *question all assumptions, understand users*
- Follow things right through *e.g. using **Soft Landings** procedures*
- Review what they do *manage expectations, undertake reality checks*
- Make others aware of what they are after *specify: what, why and how*
- Check that things will work *technical feasibility, usability and manageability*
- Get things done well, with attention to detail *communicate, train, inspect*
- Finish them off *commission, operational readiness, handover, dialogue*
- Help the users to understand and take ownership *provide aftercare support*
- Review performance in use *including **post-occupancy evaluation***
- Work with occupiers to make things better *monitoring, review and fine tuning*
- Anticipate and spot unintended consequences *revenge effects*
- Learn from it all *and share their experiences*

THEY KEEP THINGS AS SIMPLE AS PRACTICABLE AND DO THEM BETTER
