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Beyond Probe: Making feedback routine

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ABSTRACT

Forty years ago the RIBA published its Plan of Work which included Stage M – Feedback. In spite of this, it is still not routine for designers, builders, and sometimes even procuring clients to engage closely with the performance of the buildings they have created. Hence low level, chronic problems tend to persist, innovations miss their targets, and true successes may be overlooked – even in some of the best buildings, as the Probe series of post-occupancy surveys revealed. This paper discusses how feedback, follow-through from design and construction into occupancy, and post-occupancy evaluation could become a natural part of project delivery and how this could improve the quality and sustainability of our buildings. It describes progress made by Probe team members and colleagues in encouraging this since Probe stopped in 2002, reviewing options, establishing a website to provide access to feedback techniques and results, testing this with a user group and setting up a charity to promote and support feedback.

KEYWORDS

Feedback website, follow-through, Probe, post-occupancy evaluation, user surveys.

Introduction

WHAT WAS PROBE?

The PROBE (Post-occupancy Review Of Buildings and their Engineering) series of post-occupancy evaluations (POEs) of recently-completed buildings published in *Building Services Journal (BSJ)*[1] from 1995 to 2002 raised awareness of the performance of new buildings in the UK, with resonances around the world. The process and findings are reviewed in another paper at this conference (Bordass and Leaman 2004).

MAKING FEEDBACK ROUTINE

What next? In 2001 the UK government said that they were unlikely to co-fund the publication of more Probe studies in *BSJ* or elsewhere, and encouraged members of the Probe team to find ways of embedding POE and feedback more deeply in the practices of those who commission, design, make, operate and use buildings. This paper outlines the progress made, the attitudes revealed and future plans.

STRATEGIC APPAISAL

In 1999-2000, between Probe 2 and the final Probe 3, Probe team members:

- Undertook a strategic review of the findings to date. The conclusions were published in a special issue of *Building Research & Information* (Lorch 2001). The full reports can be found in the Probe section of www.usablebuildings.co.uk
- Considered strategic alliances with fifteen possible organisations representing the building industry, building designers and their clients.

STRATEGIC ALLIANCES

Of the alliances considered, four proceeded, some with groupings of several of the organisations first approached.

- Professional institutions, mostly representing designers[2], and including The Edge (see later).
- European collaboration, with European Community funding.
- The Building Research Establishment.
- Client bodies.

PURPOSE OF THE ALLIANCES

The gist of the alliances was that the products of the building industry could be much improved if feedback and post-occupancy evaluation were to become more widespread. Potential benefits included:

- Follow-through by the supply side from design and construction into early operation, giving a better customer service including "sea trials" and fine-tuning.
- Feedforward of design intent to occupiers and managers, allowing them to operate the building better.
- Feedback of experience to designers, builders, developers, project managers, and to the building department of major clients, so helping them to do better next time.

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[1] The monthly journal of CIBSE, the UK's Chartered Institution of Building Services Engineers.

[2] An alliance with facility managers was attempted but the timing was wrong. We need to try again.

Professional institutions

CHARTERED INSTITUTION OF BUILDING SERVICES ENGINEERS (CIBSE)
CIBSE was involved in initiating and supporting Probe from the outset and remains closely in touch with ongoing activities through its research manager. However, since some people mistakenly regarded Probe as principally for building services engineers, the main focus since Probe ended has been on other institutions and on integrated project teams.

ROYAL INSTITUTE OF BRITISH ARCHITECTS (RIBA)
Following research into how architects ran their offices, the RIBA (1963) published its Plan of Work for design team operation, which included Stage M – Feedback, in which architects were to return to the building to review what they had done. Sadly, however, in 1972 Stage M (although still present in principle) was omitted[3] from the RIBA's publication *Architect's Appointment* and then in RIBA Publications' guide to the Plan of Work, because clients would seldom pay for feedback and the RIBA did not wish to create the impression that architects would do it for nothing. Today the RIBA (1999) has warmed again to feedback, saying:

... the biggest improvement to be made [in customer focus]
is in systemising feedback and in instituting post-occupancy evaluation.

In 2003 the RIBA Practice Committee agreed to re-introduce Stage M. The RIBA is now reviewing exactly how this will be presented, because:

- Feedback is now seen as something that occurs throughout the life cycle of a building and a project, and not just at the end.
- Where possible, the services to be offered by the architect should be clearly defined, so that they are capable of being specified, programmed and costed.

CONSTRUCTION INDUSTRY COUNCIL (CIC)
The CIC is an "umbrella body" which brings together a wide range of professional interests in design and construction. It has always been interested in project evaluation and feedback and has developed the Design Quality Indicators, DQIs (Whyte & Gann, 2003) to help redress what was seen to be too much of an emphasis on process, cost and basic functionality in recent initiatives for industry improvement. CIC hosted a major industry workshop on POE in 2001, in which Probe team members were fully involved and which contributed to ideas developed in this paper.

[3] Ironically, the very same year saw the publication *Building Performance* (Markus et al, 1972), the seminal book on feedback including the findings of the first four years of the Building Performance Research Unit at the University of Strathclyde, which had also been supported by designers and a publisher. In hindsight, 1972 seems to have marked the end of the 1960s ambition to embed routine building performance evaluation into day-to-day professional practice, and a parting of the ways between practice and academe.

The Edge

WHAT IS IT?

The Edge is an interdisciplinary ginger group launched by the Arup Foundation, supported by but not formally connected to CIBSE, RIBA and the Institution of Civil Engineers and currently receiving funding from the Carbon Trust. It encourages people to come our of their professional "silos", to brainstorm about matters of common interest concerning the built environment, and holds regular public debates involving clients, designers, builders, government and academe. Its key themes have been sustainability and interdisciplinary working. After discussing Probe's findings with the supporting institutions, the author was invited onto its committee, partly to help promote an integrated view of feedback. Amongst other things, this has led to two debates on feedback.

DEBATE 1: RIGHT FIRST TIME?

In 2000 the author argued that buildings should no longer be seen as practically complete when they were physically complete. Nor could they necessarily be completely trouble free at the day of handover, in a world of changing customer requirements, rapid innovation, and sophisticated information and control systems. Innovations were hypotheses that needed testing, sophisticated systems needed fine-tuning, and suppliers and users needed to work together to understand each other and to improve performance. The thesis was supported by other speakers: the director of estates from Cambridge University, the chairman of a multidisciplinary design firm RMJM, and the chief executive of a major contractor, who all agreed there had to be a better way.

Those at the first open debate:

- mostly felt that follow-through and feedback should become routine;
- wanted the feedback loop to be fast, so that the results could affect the next job;
- pointed out the myopia of saving a small amount on design and construction, to create a product which then subtracted massive value over its lifetime;
- saw difficulties in getting paid for the service and developing trust & confidence;
- was concerned about the effects of fast programmes and insufficient training;
- wanted the insurance industry to support these activities as risk management exercises, rather than sometimes obstructing them; and
- pointed out that validation was already required in industries like pharmaceuticals.

The debate's major recommendation, to develop a protocol for a follow-through service was taken up by two of the speakers, with Cambridge University putting together a team of the University's main consultants and contractors, led by RMJM's chairman to consider what needed to be done.

DEBATE 2: FEEDBACK – WHY DON'T WE LEARN?

A debate in 2003 examined progress with routine feedback, with promising results:

- A speaker from Arup demonstrated how much had been done to improve feedback systems within a major consultancy since 2000, in particular using their intranet.
- A speaker from the BP/Bovis alliance showed how feedback was being used to improve quality and reduce time and cost for a repetitive product – filling stations.
- Cambridge University and RMJM reported on the progress made with their "Soft Landings" follow-through and feedback procedure, see later.

The second open debate:

- Endorsed the importance of routine feedback and encouraged clients to demand it, but still found a lot of short-termism in the industry mindset.
- Emphasised the magnitude of whole life value in relation to initial costs, but feared that the providers of buildings were often only concerned with the latter.
- Was concerned about the time it took to digest feedback into design guidance.
- Advocated alliances with ongoing relationships and shared risks and benefits.
- Identified two main forms of feedback:
  1) did we do this effectively and did it go well; and
  2) (a few years later) was it the right thing to do in the first place?
- Suggested that the costs of follow-through and feedback downstream could easily be covered by economies from using feedback to improve the process upstream.

The European Union

EUROPROSPER[4]

In 2000, Probe team members, with partners in five other EU countries, submitted a proposal to develop Probe-like assessments of energy performance, environmental performance and occupant satisfaction for use in Europe. It was rejected as too ambitious and the team was asked to narrow it down. The revised proposal, submitted under the leadership of ESD Ltd, was approved in early 2002, concentrated on the energy performance of occupied offices. The proposal was linked to the then recently-announced draft EU Directive on mandatory certification of the energy performance of buildings: this was published in finally-agreed form in OJEC (2003).

THE EUROPROSPER METHOD

Europrosper has developed prototype software for preparing hypothetical energy certificates for offices largely automatically, including recommended energy-saving measures. As yet the team does not know whether its ideas will be taken up, as this will depend on local decisions by individual member states, and coordinated by technical standards to be developed by the European Standards Organisation CEN. The response of some leading property developers, occupiers and portfolio managers to certification has been interesting, as paraphrased below:

If we are legally required to benchmark our buildings for their achieved energy performance, we may wish to measure and report performance on other things too (e.g. occupant satisfaction, journey to work and wider environmental impacts).

The EU Directive, correctly applied, might therefore trigger much wider use of POE. A requirement to relate actual consumption to design expectations could also help to close the credibility gap that so often yawns between the two (Bordass, 2001) and help to close the feedback loop.

[4] EUROpean PRocedure for Occupant Satisfaction, Productivity and Environmental Rating. See www.Europrosper.org

The Building Research Establishment

BREEAM – THE BRE ENVIRONMENTAL ASSESSMENT METHOD

The Probe team put in a joint bid for funding from the government's PII[5] programme to extend BREEAM to include POE, and to have greater transparency between design estimates of energy use and in-use outcomes. The proposal was unsuccessful. This potential collaboration may be re-awakened if we have objectives in common once the methods of EU energy certification have been agreed.

POE IN THE FIRST YEAR OF OCCUPANCY

BRE did however submit a successful PII proposal, with Probe team members as partners, for a study to look at what needed to be planned for in the first year of occupancy to ensure a smoother transition from construction into operation and to prepare for any necessary POE activities such as technical, occupant and energy surveys. The main outcome was a manager's checklist, now incorporated within a BRE Digest (Jaunzens et al, 2003) entitled *Feedback: getting started.* The checklist could potentially be incorporated within Soft Landings and other procedures.

Client Bodies

THE CLIENT MOVEMENT

The Latham (1994) report had emphasised the importance of client leadership and led to the formation of CCF, the Construction Clients Forum, to bring together client interests. The CCF also liaised with CRT, the Construction Round Table, a group of major clients, particularly in infrastructure and retail. The Egan report (1998) further emphasised the role of the client and the government encouraged CCF to develop a good practice guide for clients. In 2000 CCF and CRT merged into the Confederation of Construction Clients, CCC. In 2001 CCC published its code of practice – the Client's Charter – which amongst other things included requirements for clients to undertake feedback on the performance of their products, their suppliers, and themselves.

A FEEDBACK SYSTEM FOR CONSTRUCTION CLIENTS & THE INDUSTRY

The Probe team thought that a good way to make feedback systems routine was for clients to ask for them; a conclusion also reached at the Edge Debates. We were therefore delighted when a team sponsored by the CCF invited us to help them to prepare a PII proposal to develop a feedback system to help clients meet their Charter obligations to obtain information on their completed projects. The history of the project is outlined in another paper (Derbyshire, 2004): here we concentrate on its outcomes.

[5] Partners in Innovation. This was the government programme under which Probe was also funded.

Initial research for the PII

STEERING GROUP INPUT

The PII had intended to focus on the performance of the completed product – POE in the traditional sense. The steering group[6] disagreed: this came far too late in the process. We were asked to look at the use of feedback throughout the life cycle of a building and of a project. This increased the breadth of the PII but reduced its depth. The steering group also wanted us to make the business case for feedback to senior management, but this proved more difficult, as discussed later.

CLIENT QUESTIONNAIRES AND WORKSHOPS

We circulated a questionnaire to the members of the CCC, and followed this up with telephone interviews and a series of workshops both for members and other clients. The workshops were very lively and revealed:

- A general interest in feedback: many clients had undertaken feedback exercises of some kind, though seldom systematically.
- Considerable uncertainty about what feedback techniques were available, how they should be best used, what they should cost, and what value they added.
- The name POE did the activity no favours: post-occupancy evaluation was seen as too academic, and too late to benefit the project concerned.
- Clients did not see why they should pay designers to undertake POEs on recently-completed buildings, as this would benefit future clients more than themselves.
- Procurement wings of major clients often behaved in much the same way as the supply-side, moving on as soon at the building was handed over. Many seemed more interested in procedures and tick-lists to say that they had done a good job, than in closer engagement with the building and its occupants.
- Knowledge management systems tended to be poor, even for many leading clients and certainly in most of the construction industry. Clients feared that feedback information would stay on the shelf and never get used.

There was some suspicion about Key Performance Indicators (KPIs), which have been burgeoning in the UK over recent years, particularly for government procurement. Many felt that KPIs did not get close enough to the things they really wanted to improve. Some, they felt had been designed more to satisfy bureaucrats than to add value on the ground, and involve clients in form-filling when they could have been doing more useful things. We were advised to avoid this trap.

BUSINESS BENEFITS, OR BETTER BUILDINGS?

At both the steering groups and the workshops, clients talked about the business benefits of facilities and encouraged to us to make the business case for feedback to convince their senior management. This proved difficult - as often it must have been for them: not because a case isn't easily made (POEs often reveal major opportunities to reduce running costs and raise occupant satisfaction and productivity), but because senior management generally wants to concentrate on core business and regards buildings as nuisances which they would prefer not to know about. We eventually decided that it would be best to concentrate on using feedback to get better buildings, and to help get rid of the problems which routinely occur and subtract value.

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[6] This consisted of major client members of CCC, together with representatives of CCC, CIBSE, CIC, and RIBA, a client adviser, an architect, an engineer, a project manger, the project team, and a representative of the government funding department DTI – the Department of Trade & Industry.

LITERATURE REVIEW

Key findings from the literature review have been published (Bordass, 2003). We concluded that the construction industry was slow to learn from its completed products[7], particularly in the hands of their users. Feedback needed to become routine: both as quality control in the more repetitive projects; as a necessary part of hypothesis-testing in innovative ones; and to increase awareness of chronic problems, changing requirements and emerging properties in any event. Clients who had outsourced their building experts and facilities management services could be particularly vulnerable if effective feedback systems were not in place (Federal Facilities Council, 2001).

In spite of the many good reasons for closing the feedback loop, there were many barriers and not enough driving forces. Many clients and writers advocated a broadly-based, comprehensive approach to feedback, but we found that most organisations could not cope with this, or afford it. Better to start small, simple and practical.

WHAT WE DECIDED TO DO

Following our initial investigations we agreed to:

- Move the emphasis from POE to the use of feedback at all stages in the life cycle of a building and of each construction and alteration project.
- Produce an awareness-raising document on how clients can benefit from feedback, and the techniques available. This is now being completed with the assistance of and for publication by the Office of Government Commerce, OGC[8].
- Review and classify available feedback techniques and put them on a website which can help people to identify what techniques they may need, what they do, how to use them, and who can give help. This Feedback Portfolio is described in more detail later.
- Test the above in case studies with selected clients.
- Develop a business plan to continue the work after PII funding ended in 2004.

A CHANGE OF PLAN

At the end of 2002, when ideas for the Feedback Portfolio were nearing completion and opportunities for case studies were being sought, CCC itself had funding difficulties and was unable to continue its support[9]. Clients generally were losing the enthusiasm for industry leadership generated by the Latham and Egan Reports, feeling that the industry should do more to put its own house in order. Unable to find enough clients who wanted to get directly engaged in feedback systems in depth and at short notice, we therefore switched our attention to designers (with their clients where possible), who had been found in a parallel project[10] to be a more homogeneous interest group, and more accustomed to working together to build expertise while at the same time competing to apply it.

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[7] Blyth (2000) observed that most designers only notice that something is wrong when they are asked to investigate a failure.

[8] An office of the UK Treasury, set up to help government departments to specify and purchase better and more cost-effectively. OGC has a major initiative to help government clients obtain better buildings, with its Achieving Excellence in Construction guides and associated support services.

[9] PIIs were based on a maximum of 50% government funding, with the balance (in cash or in kind) from the other partner organisations, in this case the CCC.

[10] *Learning from experience,* led by DBA, of which the products are in the Feedback Portfolio. DBA is now leading another companion PII, *Spreading the word,* on knowledge management in design offices.

The feedback user group

DESIGNERS, PROJECTS AND POE

Historically, designers have not done much routine POE and feedback. They hand over one job (often less profitably than they had hoped) and hurry on to the next. However, as clients and government become more interested in building performance, leading design firms are realising that a better understanding of how their buildings actually perform is no longer an option but essential to their survival. Tying feedback and POE into project delivery also made sense to us, as this would automatically engage the supply side, providing the better follow-through and customer service we had been seeking. In North America, the Federal Facilities Council (2001) had reached a similar conclusion after finding that if POEs were done at all, they usually took place within a year or two of handover.

USER GROUP MEMBERSHIP

The twelve organisations on the user group are:

- Multidisciplinary practices (Arup[11], Atkins and RMJM).
- Architects (Broadway Malyan, Edward Cullinan Associates, Feilden Clegg Bradley and Reid Architecture).
- Engineers (Buro Happold and John Packer Associates).
- Clients (BBC, Land Securities and Oxford University).

Members also involve others on their project teams, including clients and facilities and project managers where they can. The group has met every 2-3 months to discuss ways of making feedback a routine part of project delivery and to review progress and results of their tests of techniques in the Feedback Portfolio on their projects. Summary reports of these case studies will be posted on the website in due course.

The feedback portfolio of techniques

ONE SIZE DOES NOT FIT ALL

The Federal Facilities Council (2001) study in North America had hoped to produce a single preferred method of POE, but finally recommended against it because contexts, needs and resources could vary greatly. While organisations may like the idea of a comprehensive review, most cannot find the time and money to do it. Usually they are better off starting small, with a few things that they are really interested in, and where possible using techniques that are simple, robust, practical and cost-effective.

THE IDEAL TECHNIQUE?

Ideally techniques should be simple to use; widely applicable; robust but comprehensive; cheap, quick and easy to operate; and give useful results speedily[12] (Leaman, 2004). Where possible, benchmarks should be freely available: in practice this has proved difficult because steady funding for data management can seldom be found, which helps to account for the lack of continuity in many POE activities[13]. But the internet is beginning to make things easier.

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[11] Including Arup Associates.

[12] And preferably in a form that can satisfy a range of users from researchers testing hypotheses to designers and managers wanting to know what they should do next.

[13] Good benchmarking has tended to need either a thoughtful and well-resourced public programme or some sort of licensing and payment arrangements.

THE PORTFOLIO APPROACH

The website www.usablebuildings.co.uk therefore contains a mix-and-match Portfolio of Techniques (well-established where possible) for people to choose from. All the material is accessible through a simple-but-powerful user interface, with every item clickable. In due course we hope to add results, technical notes, guidance etc..

THE PORTFOLIO SO FAR

Although the website can be extended almost indefinitely, at the time of writing there are only ten techniques in it. Why so few? This was sufficient to prove the concept under the funding constraints; and User Group members wanted it kept small (at least to start with) because choice would have been confusing and would have reduced the opportunity for direct comparisons of their experiences and results. Currently the Portfolio includes only general-purpose UK-developed techniques, are capable of being used in a wide range of non-domestic building types[14], and where possible having a good track record and benchmarks available.

WHAT'S IN THE PORTFOLIO?

Currently the techniques are in five categories: further categories will be added as the portfolio expands. Further details are available on the website.

1. *Audit category.* This includes quantitative technical assessments, at present the *CIBSE TM22 energy survey method,* which was used in Probe.
2. *Discussion category.* This includes techniques which get people together to discuss what they are about to do *(foresight),* what they are doing *(insight)* or what they have done *(hindsight).* These currently include *Learning from Experience*[15] workshops and/or interviews, and the post-project (hindsight) review workshops[16] devised by *HEDQF – the Higher Education Design Quality Forum,* initially for university buildings but now being used more widely.
3. *Questionnaire category.* This includes the *BUS occupant survey* as used in Probe and elsewhere, the *CIC Design Quality indicators*[17] and the *Overall Liking Score,* a rapid survey of occupant satisfaction.
4. *Process category.* This includes techniques – currently *Soft Landings* and the *BRE Checklist* - which are used to adapt the procurement process to incorporate feedback in an organised manner. Both of these have been outlined earlier.
5. *Packages category.* This currently includes the *Probe* package[18] discussed by Bordass et al (2004) and the *AMA Workware* package[19], which is most frequently used before and after making organisational and space planning changes.

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[14] Housing and civil engineering projects are not yet covered, nor are sector-specific techniques, e.g. for schools or hospitals. These will be added later. Nevertheless many of the generic techniques can be used in these sectors too.

[15] From which the foresight, insight and hindsight definitions also come.

[16] Four in one day, examining in turn the brief, the procurement system, the product, and sustainability.

[17] The DQI questionnaire asks respondents questions about functionality, build quality and impact. It was initially designed to assess the completed building but has been found if anything more useful in improving the dialogue between client, designers, users and other stakeholders during briefing/ programming and design development, where it would also fall into the *Discussion category.*

[18] Which incorporates the *BUS occupant questionnaire* and the *CIBSE TM22 energy survey method.*

[19] Incorporating an occupant questionnaire and tools to study the use of space and time.

APPLICABILITY OF TECHNIQUES THROUGH THE LIFE CYCLE

Figure 1 is a screenshot of the user interface from development version of the website, showing where the techniques are most appropriately used throughout the life cycle:

- The ten techniques are shown in the left-hand column, in alphabetical order but colour coded by the Categories discussed above.
- Techniques in one category only can be shown by clicking the appropriate Category name *[in square brackets immediately above the technique names]*.
- Clicking on the name of the technique opens two more windows: one with details of the technique, what is does, how and where it has been used, and how to get help; and the other with links to publications, websites and contacts[20].
- The legend along the top of the table shows the life cycle stages, divided into five principal stages with two sub-stages each. Despite the simple language, these titles were chosen after examination of a wide range of published plans of work[21].
- Each title can be clicked upon for an explanation of its meaning.
- The table shows the likely applicability of a technique at the different stages. *(H=High, M=Medium, L=Low, Prepare=Planning required here for use later).* Each letter can be clicked for details on its meaning in the particular context.

FIGURE 1: USER INTERFACE SHOWING STAGES IN THE LIFE CYCLE

About the Portfolio

Feedback Portfolio: Techniques

Showing: Where used in life cycle [Development, Publication and Practical Details] →

	Prepare		Design		Implement		Finish		Use	
	Verify need	Strategic brief	Option appraisal	Develop design	Prepare to implement	Implement	Complete	Initial operation	Routine operation	Change
Showing: All [Audits] [Discussions] [Packages] [Process] [Questionnaires] ↓										
AMA Workware Toolkit	H	H	M	H				H	M	H
BUS Occupant Survey	M	M						H	H	H
CIBSE TM22 energy survey		M	M	M		M	M	M	H	H
CIC DQIs	M	M	H	H				M	H	H
HEDQF POE Forum									H	
Learning from Experience	M	H	M	M	H	M	L	H	L	H
Overall Liking Score	M	M						H	H	H
POE 1st year Occupancy		L			Prepare	Prepare	H	H		
Probe								M	H	H
Soft Landings		Prepare			Prepare	Prepare	H	H	H	

The mapping of the techniques gives some useful insights. For example:

- The Probe package was a method of POE and so is only directly relevant once the building is completed and best once it has settled into routine operation.
- However, constituents of Probe have wider application, for example:
  - The BUS survey is commonly used to find out what occupants think about a building before alterations, relocation or new construction is planned.
  - The CIBSE TM22 method, though developed for energy surveys of buildings in operation, can also be used when developing design targets, in checking the design and in confirming what is installed and commissioned on site, in order to provide greater transparency between expectations and outcomes[22].
- Soft Landings focuses on aftercare and feedback in the first few months and years of occupancy, but for the process to work preparation is required long beforehand.

[20] These two new windows and the original navigation window can be placed and sized wherever the user wants them on the screen, and will stay in the same locations for the rest of the session.

[21] First in the UK but more recently reviewed for North America, Europe and some other countries by Francoise Szigeti of the International Centre for Facilities.

[22] The Europrosper team is using this approach in developing methods of EU energy certification.

TECHNICAL CHARACTERISTICS OF TECHNIQUES

Figure 2 is a screenshot of the user interface used to compare the attributes of each technique[23]. The techniques list down the left is the same but the top strip now shows their attributes in three main groups:

1. *Development status.* How well established it is, whether development had ceased or is continuing, and whether the technique is accredited by recognised bodies.
2. *Publication status.* How available in the public domain is the technique, the results produced, and the associated benchmarks.
3. *Practical details,* in particular availability of software, how easy it is to do without specialist support (other than via the internet), and how expensive it is likely to be.

Again, each cell can be clicked on for more precise information on the exact meaning of the term in the context.

FIGURE 2: USER INTERFACE SHOWING ATTRIBUTES

About the Portfolio

Feedback Portfolio: Techniques

Showing: Development, Publication and Practical Details [Where used in life cycle] →

	Development status			Publication status			Practical details		
	Well established?	Development continuing?	Technique accredited?	Technique published?	Results published?	Benchmarks available?	Software available?	Easy to do yourself?	Level of effort and
Showing: All [Audits] [Discussions] [Packages] [Process] [Questionnaires] ↓									
AMA Workware Toolkit	H	M			L			L	M
BUS Occupant Survey	H	H	M	M	M	H	M	M	Varies
CIBSE TM22 energy survey	M	H	No	H	M	H	H	M	Varies
CIC DQIs	L	H	M	L	L	L	M	M	tba
HEDQF POE Forum	M	L	M	M	L	n/a	n/a	M	££
Learning from Experience	L	No	No	H	L	n/a	n/a	M	M
Overall Liking Score	M	M	L	M	M	L	L	M	L
POE 1st year Occupancy	No	No	No	H	No	n/a	n/a	H	L
Probe	H	H	No	M	H	H	H	L	M
Soft Landings	No	H	Not yet	Not yet	Not yet	Partial	n/a	Essential	H

POSSIBLE FURTHER DEVELOPMENTS

New techniques will be added to fill gaps, for example on cost, sustainability, and specific aspects of technical performance. The classification will also be developed. More user interface screens and classifications may also develop, for example perhaps a portfolio of core techniques preferred by the User Group, and supplements showing emerging, specialised, sector-specific and international techniques. Discussions are also planned on improving compatibility between some techniques (e.g. common protocols for data scales, definitions, categories, means of presentation and data analysis frameworks); and eventually some techniques may even merge.

[23] Note that the screen shots are from the development version. The classification is still to be finalised and the attributes of the techniques need to be reviewed, particularly the entries in black in figures 1 and 2. An updated version will be available on the website by the time of the conference.

Maintaining the momentum beyond the PII

PLANS FOR THE CONTINUATION

An important part of completing the PII has been how to sustain the feedback initiative and the Portfolio after PII funding stops. Initially this was to have been via the CCC, then via relationships with a variety of industry bodies, but ultimately we decided – with the support of DTI and the steering group – that a charity would be best. This could dedicate itself to promoting feedback generally, disseminating information on techniques and results and assisting new developments. In November 2003, the Usable Buildings Trust (UBT) – which had already been hosting the prototype Portfolio website - agreed to take things forward after the PII was over; and a funder had generously offered to match any new money raised to finance this effort.

SPECIFIC FUTURE DEVELOPMENTS

UBT will launch its feedback initiative and start new fundraising in summer 2004. Its plans are not yet finalised but are likely to include:

- Maintaining and developing the Portfolio of Techniques website.
- Considering a Portfolio of Results website, with a similar user interface.
- Seeking to continue the User Group.
- Talking to key players in various sectors (e.g. schools, higher education, healthcare and housing) about setting up their own specialist user groups.
- Promoting research, development, education and training in the area.

Conclusions

After many false dawns, it now seems possible that feedback and POE will begin to become more routine – promising better, nicer, more productive, more cost-effective and more sustainable buildings which are better suited to the needs of their users. It will be a long haul, but clients, designers and government are becoming more interested in building performance and some are already requiring or offering aftercare services.

Feedback systems must not just be imposed from above, but be useful to those actually working on projects. Effective techniques are already available, some with good track records. IT and the internet are making them faster, more powerful, more economical, easier to use, and providing more reliable statistics and benchmarks.

We need to make good use of the results. Feedback data needs to be managed in order to lead to effective learning. But data and knowledge management tends to be a weak spot for most organisations, even purveyors of feedback techniques. This is why the PII finally decided to focus its efforts on project teams and their immediate clients, who are able to put their experience and new understanding into action immediately. But much effort is now going into developing knowledge management systems too.

To promote and support feedback in the public interest can be difficult for government, institutions and industry. Initiatives come and go and there are always vested interests and budget cuts to watch out for. We have concluded that a charity is the most appropriate source of information and advice, and look forward to its getting support from a range of public, institutional, commercial and professional sources.

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