

**Building Performance Assessment--from POE to BPE:
a personal perspective
(post-occupancy evaluations and building performance evaluation)**

The Evolution of Post-Occupancy Evaluation

In the late 60s, evaluation case studies of university dormitories were carried out by Sim van der Rijn of the University of California, Berkeley, and Victor Hsia of the University of Utah. While not called post-occupancy evaluations (POEs), these evaluations were among the first systematic attempts at assessing building performance from the building users' point of view. A bibliography published by the Department of Housing and Urban Development (HUD) (Bechtel and Srivastava, 1978) claimed to list 700 POEs, starting in 1913. But upon careful examination, there was only one entry that had the term "post-occupancy evaluation" in its title. It dealt with military postal facilities, and was commissioned by the AIA Research Corporation (Connell & Ostrander, 1976).

Inspired by van der Rijn and Hsia, the author's Master's thesis also focused on evaluating dormitory performance, i.e., at Virginia Tech. It employed political science rating scales (the Thurstone Scale of Equal Appearing Intervals), which have an error rate of no more than 3% to 5%. These rating scales were used to create quality profiles, as perceived by the students living in three very different types of dormitories. The newest ones looked like high-rise prisons, and the oldest looked like Oxford-style, two-story walk-up structures. Not surprisingly, they scored highest. The results of this study were presented at the first conference of the Environmental Design Research Association (EDRA) at NC State (Preiser, 1969). Then in 1973, the author organized the EDRA 4 conference, at which the movement of assessing building performance gained steam. The author's Ph.D. dissertation at Penn State focused on the evaluation of public spaces in the then new Columbia Mall in Maryland (Preiser, 1974).

By the mid-1970s, the first publications with term "POE" in their title appeared: according to the author's extensive literature searches, the very first one was authored by Herb McLaughlin of KMD Architecture in San Francisco in the AIA Journal issue of January 1975. He and a team of consultants had done POEs on hospitals in Utah and in San Francisco.

Over the past 30 years, Herb has been an ardent supporter of POE as a tool for in-house knowledge building in architecture and design firms (McLaughlin, 1997). Thus, in all likelihood, his was the very first publication on POE, although during the year prior, the Veterans Administration in San Diego had conducted systematic POEs of their hospital facilities, but they were not published until later in 1975.

There was the first methodological review of POE techniques that was, again, commissioned by the AIA Corporation under John Eberhard's directorship (Connell & Ostrander 1976). In the 80s, lots of POE activity was going on in the UK, Canada, New Zealand, Australia, and the US on public works projects, government buildings, airports, etc., resulting in very sizeable and significant POE studies.

In 1986, John Eberhard was responsible for putting together committees on opportunities for improvement in the practices of programming, post-occupancy evaluation (Committee on Post-Occupancy Evaluation Methodology, 1987), as well as the element that links the two conceptually; i.e., database development. The author was asked to chair both the programming and POE committees, and the reports came out in 1987, published by the National Academy of Sciences. What is really interesting to know is whether the recommendations of the reports have come true. Yes, indeed they have, especially in the information technology (IT) arena, which was in its infancy at that time.

Preiser, Rabinowitz & White (1988), wrote the first POE textbook, which has since been translated into Japanese, Korean, and most recently, Arabic. Interestingly, when the author visited major construction companies in Japan, including Shimizu Corporation, for POE presentations in 1993, someone came up and proudly said, "Hi, we translated your book". Whereupon the author said, "How can one get a copy?" He answered, "Well, I have to get permission from my company first." So much for the protection and integrity of intellectual property rights. The appendix of that book is perhaps the most interesting part, because it presents measurement techniques for getting feedback on the quality of facilities. They are mostly subjective, user response type measurement instruments that have been developed and refined over time. Considered to be a companion volume to Post-Occupancy Evaluation, the book Building Evaluation was published a year later (Preiser, 1989), with case studies from around the world.

Over the years, the author has developed a 3-day POE Training Workshop format, which empowers participants to carry out evaluations on their own facilities without having to hire a POE consultant (Preiser, 1996). This format provides for: Day 1: POE instruction on methodology and case study examples; Day 2: Field data gathering using quick surveys (for larger facilities it is recommended to administer POE surveys and analyses ahead of the site visit), interviews, observation, plan annotation and photography; and, Day 3: Drafting of executive summary report and presentation to senior management. Clients for these workshops have included: Carnegie Mellon University; Duke Medical Center; the University of Melbourne, Australia; the Building Management Agency and the University of Western Australia; Kaiser Permanente in California and the State of Washington; Bar-Ilan University, Israel; and, Helsinki University of Technology, Finland.

To better understand the conceptual and theoretical basis for post-occupancy evaluation/building performance evaluation, it is necessary to briefly address some underlying issues. There is even a sub-field called "building pathology" in the U.K., which focuses primarily on the physical diseases of buildings, especially historic structures. One has to have criteria for evaluation.

Since the term 'evaluation' includes the notion of 'values', one has to clearly establish whose values are involved, and what one does to compare/benchmark findings in this field with.

[FIGURE 1 OMITTED]

The early POE framework (Preiser, Rabinowitz and White, 1988) provided for three levels of effort, degrees of sophistication and data-gathering techniques, cost, manpower, etc.; indicative, investigative and diagnostic POEs. The 3 POE phases with 3 steps each were: (1) Planning: reconnaissance and feasibility, resource planning, research planning; (2) Conducting: initiating on-site data collection process, monitoring and managing data collection procedures, analyzing data; and, (3) Applying: reporting findings, recommending actions, reviewing outcomes. Finally, the 3 categories of performance criteria were: people, settings and relational concepts. Later, this framework was considered to be quite simplistic, and, in many ways, inadequate.

Toward Building Performance Evaluation

In the mid-90s, the author had the opportunity to collaborate with a visiting scholar from Germany, Dr. Ulrich Schramm, who had received his Ph.D. on the topic of cross-cultural POEs (public health clinics in Egypt) from the Technical University of Stuttgart. Issues pertaining to the building delivery cycle, as well as the life cycle of a building--a meta level approach to building evaluation, were investigated jointly, and subsequently, an integrative framework for building performance evaluation was developed. In this framework, post-occupancy evaluation represents only one of six internal review loops, and it focuses on the entire life of a building, as well as the notion of feed-forward into the next building cycle (see Figure 1).

The key concept was a gradually evolving knowledge base that is translated into building

performance criteria. They cover: issues like health, safety, security; issues addressed by building codes; functionality and guideline materials; and last, but not least, the social, psychological, cultural aspects of building performance. This integrative framework for Building Performance Evaluation (BPE) was published in Time-Saver Standards (Preiser & Schramm, 1997).

In 2001, the National Academy of Sciences revisited the topic of POE in a day-long symposium, dealing primarily with POE in U.S. Government agencies. A book resulted, entitled Learning From Our Buildings: A State-of-the-Practice Summary of Post-Occupancy Evaluation (National Academies Press, 2001). It was interesting to note that government is getting increasingly involved in this activity, and has gathered a lot of experience, such as the General Services Administration. Another example is the State Department, which has commissioned many POEs on embassy facilities. Given the phenomenon of terrorism, it can be assumed that they will continue to be carried out, not just in government, but also in the private sector.

More recently, the National Council of Architectural Registration Boards (NCARB), commissioned the author to write a monograph on 'Improving Building Performance' for their Professional Development Series (Preiser, 2003). They publish monographs on sustainability, ethics and other timely topics. One can get tested on that material, and earn recertification/continuing education credit. This may be the most important publication the author has ever written, because now every architect can learn about this topic and use it in his/her practice. Included were four case studies from major firms who are engaged in building performance assessments, primarily for in-house learning and knowledge building: NBBJ in Columbus is considered to be the world's premier health-care facility design firm. They did a case study on a hospital in Iowa with the idea of knowledge building, whereby some key programming and research personnel were nurses turned programmers. They were truly interested in establishing whether the operational performance of the hospital was good. The second case study was by KMD Architecture in San Francisco. They had done a project on transitional housing, and they went back and evaluated it. Then there was Jay Farbstein Associates in Los Angeles with a POE project on post office facilities, a huge project. And finally, there was the Cincinnati firm of Steed-Hammond-Paul (SHP), showcasing a high school evaluation.

Case study examples like these are very encouraging. If one can identify major architecture firms in the USA, who are availing themselves of techniques that help them build their knowledge base (see Figure 2), then that can be considered progress. Some firms are posting the evaluations on the Web, but in so doing, they don't reveal all the information, in order not to give away their trade secrets. They just want to demonstrate that they are conscientious about knowledge building, and that they work closely with their clients to accomplish this goal.

What is Next?

Starting in 1995, the efforts of the International Building Performance Evaluation (IBPE) consortium have culminated in a book, published by Elsevier (Preiser & Vischer, 2005). It is a book about the conceptual basis for building performance evaluation, and it has case studies from around the world--from Japan, Hong Kong, the Netherlands, Germany, the UK, Canada, Brazil, etc. Here again, perhaps a very interesting feature is the appendix which contains 'tool kits' of measurement techniques and instruments, which readers can adapt for their own purposes.

[FIGURE 2 OMITTED]

The question has to be asked: What is next? Should one advocate more investment in knowledge and data base building? Is litigation an unwanted but likely consequence of critical scrutiny of building performance? Should one move closer to facilities management? Is design-build the answer? Who is in control of the building delivery process? The architect certainly appears not to be.

Finally, can cost benefits of BPE be demonstrated? The answer is yes. In a just completed

evaluation of 42 libraries in Hamilton County, OH, BPE and GIS methods were combined to measure the libraries' productivity/efficiency regarding circulations per annum, plus 7 other key performance indicators, including population demographics, service areas, and building capacity, to name just a few (Preiser & Wang 2005). This new productivity algorithm may well point the way to the future for BPE.

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