POST OCCUPANCY EVALUATION IN MALAYSIA: THE NEED FOR AWARENESS AND KNOWLEDGE

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ABSTRACT: Buildings are built for people. Hence, it is only logical to ask the people in order to understand how well the buildings perform. The fundamental concept of Post Occupancy Evaluation or more affectionately known as POE that fosters user feedbacks in building performance evaluation has made it the ultimate mechanism for continuous improvement of building performance. The emergence of awareness among builders to learn how their buildings perform from the perspective of the users over 50 years ago has brought a new dimension to the construction industry in various developed countries. However, the awareness and knowledge to incorporate user feedbacks as part of the building construction process in the Malaysian construction industry is low and the mistakes done in completed buildings remain continuously undocumented. The reception towards continuous improvement in developing countries is still at its infancy and continuous improvement mechanisms such as POE has yet to be fully appreciated by many. This paper will discuss the need for awareness and knowledge about POE among the practitioners in the construction industry. A recent survey conducted by the authors on the awareness and knowledge of practitioners on POE will also be presented to understand their perception and understanding of POE as the mechanism to audit user feedback for improved building performance. POE has been regarded by many as a mechanism for continuous improvement of building performance par excellence. However, without the awareness and knowledge to implement it, continuous improvement of building performance will merely be an idea to be achieved.

Keywords: Building Performance, User feedback, Awareness, Knowledge, Continuous improvement, Post Occupancy Evaluation (POE)

1. INTRODUCTION

Unlike other industrial sectors, the construction industry has been slow at learning from what it has delivered to its users. Much has been said about how learning from building occupants should be an integral part of the building construction process. However, in practice, learning from building occupants for continuous improvement of building performance is still regrettably rare. Way and Bordass (2005) acknowledged the fact that the construction industry has been slow to learn from buildings in use because it does not get close to its user and clients.

However, the awareness among builders to learn how their buildings are performing from the perspective of the users has been gaining popularity over the past 50 years. Various countries all over the world have taken the effort to improve building performance by carrying out user satisfaction studies on completed buildings. Post Occupancy Evaluation or better known as POE is the most widely used mechanism to audit user feedbacks in the effort to continuously improve building performance.

2.   The Issue

Post Occupancy Evaluation (POE) has been practiced in many nations for more than 50 years. Stories of building performance improvements and escalating user satisfactions echo wherever this simple yet effective approach is practised. Surprisingly, although POE has been long practised elsewhere, its application in Malaysia has yet to gain much interest of the practitioners in the construction industry and facilities management (Izran, Hakim, Shardy, 2008). A recent pilot survey conducted by the authors (will be discussed in 3) on the awareness, knowledge and interest of practitioners in the Malaysian construction industry on the need to foster user feedbacks in building performance evaluation has revealed that: (a) Most practitioners do not possess the awareness and interest to gain user feedbacks in the evaluation of building performance. (b) Most practitioners are not sure what mechanism to be used to audit user feedbacks for building performance evaluation.

The absence of a building performance appraisal system that incorporates user feedbacks is one of the reasons why we lack essential information on how our buildings are performing. Prof. Sr. Dr. Abdul Hakim Mohammed stated that the absence of such information causes the same mistakes to be repeated (Berita Harian, 2007). Similarly, the Deputy Director-General of Health of the Ministry of Health Malaysia, Datuk Ir. Dr. M.S Pillay stated in the recent National Asset and Facility Management convention (NAFAM 2007) that past mistakes that are done in our buildings are not documented.

Though users have been recognised as one of the major concerns in any construction project, little has been done to learn from user satisfaction that could lead to continuous improvement. Instead we are attuned to adopting the 'fire fighting habit', acting from complaints, seeking rapid action, instant solutions to immediate problems (Eley, 2001). Similarly, Malaysia adopts the same approach by discovering the weaknesses of completed buildings from complaints (Izran, Hakim, Shardy, 2007). There has been no form of a properly formatted and continuous survey.

Although there is increasing interest in building performance, the people who procure, design and construct buildings seldom engage closely with the performance of the buildings they have created (Bordass & Leaman, 2005). From the point where the building is handed over to the occupants, it has been accepted as almost a custom for the occupants to evaluate whether the building does or does not conform to their needs. Of course, problems will surely occur and dissatisfactions will inevitably arise which leads to complaints and followed by actions taken by the management to overcome the problems. However, it is rare for either the management or the people who developed the building to properly document and analyse the feedbacks of the users to further improve the performance of the existing building (Izran, Hakim, & Shardy, 2007). Even if such measures were undertaken, it would most likely be a one-time effort. A continuous practice of such measures is regrettably rare. This will indirectly cripple the prospect of improving the performance of future buildings based on the feedbacks obtained on existing buildings. In other words, the experience of the users is not utilised as part of the development and continuous improvement process of buildings.

The upbringing of various building performance evaluation methods including Expert-Based Systems, Checklist Appraisal Systems, Architectural Feasibility, Matrix Methods, the Orbit 2.1 system, etc., is seen as a revolution among building designers, builder, and managers to learn from our buildings. However, all of these systems fail to incorporate user feedbacks in the performance evaluation process. Most building performance paradigms fail to take into account the effect of occupiers' perceptions of their environment

(Fleming, 2004). The only known building performance evaluation method that fosters user feedbacks is Post Occupancy Evaluation.

3.0   Post Occupancy Evaluation In The Malaysian Construction Industry

Post Occupancy Evaluation is a general term used for any exercise of seeking feedback on the performance of an occupied building (Jauzens, Grigg, Watson, & Picton 2003). POE is defined as "the process of systematically evaluating the extent to which a facility, once occupied for a period of time, meets the intended organisational goals and user-occupant needs" (Preiser et al., 1988). POE constitutes an appraisal of the degree to which a designed environment satisfies and supports explicit and implicit human needs and values for those whom a building is designed (Preiser et al., 1988).

Ever since its application in the 1960s, POE has contributed significantly to the improvement of building performance in the construction industry. Since its initiation almost 50 years ago, POE has evolved into approximately 150 hybrids and practised in several countries, all based on the foundation of fostering user feedbacks to improve building performance.

Despite the countless success gained by implementing POE elsewhere, the use of POE in Malaysia is almost unheard of (Izran, Hakim, & Shardy, 2007). A study on the practice of POE in Facilities Management organisations in Malaysia conducted by Zuriati Ashaari in 2005 has revealed the following facts:

- The government sector/ non-profit organisation lack in the implementation of POE. (Only 1% has a mechanism to rate building/ facility performance through user's satisfaction)
- Full knowledge on POE has yet reached practitioners.
- A large number of personnel in Facilities Management organisations in Malaysia do not know what mechanism to use to measure building/ facilities performance through user satisfaction.

- There is no provision in the government's budget to evaluate user satisfaction of the facilities provided.
- Some organisations do not clearly know how the results of the user satisfaction study are being used to benefit the organisation.
- Building/ Facilities Evaluation based on user satisfaction has only been partially implemented in the organisations in Malaysia less than 5 years.
- No involvement of designers in determining what the customers need and what type of buildings or facilities that the customers are satisfied with.

A more recent study conducted by the authors has resulted with similar findings. Three groups of respondents that consisted of architects, developers and facility managers were selected for the distribution of questionnaires. The aim of the survey was:

- To identify the level of awareness of the practitioners in the construction industry on the need to foster user feedbacks for building performance evaluation, and
- To learn whether they possess the knowledge on how to foster user feedbacks in the evaluation of building performance.

The summary of the findings are shown in the following table.

Table 1.The Perception of Practitioners on User Feedback studies/ POE

Question categories	Architects		Developers		FM Managers/ Officers	
				No	Yes	No
The importance of user feedback studies in building performance evaluation				63%	92%	8%
The benefit of user feedback studies in providing information for				68%	97%	3%

Question Categories					Yes	No
better building design						
The need to incorporate user feedback studies as part of the building design and construction process.				64%	73%	27%
Interests to take part in user feedback studies/ POE for building performance evaluation				96%	92%	8%

Source: Pilot survey, 2008

Table 2. The Knowledge of Practitioners on How to Audit User Feedbacks

Question Categories	Architects		Developers		FM Managers/ Officers	
				No	Yes	No
Familiarity with user feedback study methods				96%	12%	88%
Experience in user feedback studies				100%	6%	94%
Knowledge on how to use data from user feedback studies in decision making				100%	2%	98%

Source: Pilot survey, 2008

The figures shown in the above tables demonstrate the level of awareness and knowledge of the practitioners in Malaysia's construction industry on post occupancy evaluation. The questions dealing with the awareness of the practitioners could be divided into 3 main categories:

i) The importance of user feedback studies in building performance evaluation
ii) The benefit of user feedback studies in providing information for better future building design.
iii) The need to incorporate user feedback as part of the building design and construction process
iv) The interests of practitioners to take part in user feedback studies/ POE for building performance evaluation.

In general, the figures indicate that:

i)   58% of the practitioners in Malaysia say that user feedback studies are important for building performance evaluation.

ii)   51% of the practitioners in Malaysia say that user feedback studies is beneficial for the improvement of building design

iii)   58% of the practitioners in Malaysia say that user feedback studies should not be part of the building design and construction process.

iv)   67% of the practitioners in Malaysia say that they are not interested to take part in user feedback studies for building performance evaluation.

Interesting enough, when looking at the responses of practitioners by group, a different pattern takes shape:

i)   Importance of user feedback studies for building performance evaluation: 55% of architects say 'not important', 63% of developers say 'not important', and 92% of Facilities Managers/ Officers say 'important'.

ii)   Benefit of user feedback studies for improved building design:
       77% of architects sat 'not beneficial', 68% of developers say 'not beneficial', and 97% of Facilities Manager/ Officers say 'Beneficial'.

iii)   The need to incorporate user feedback studies as part of building design and construction process: 63% of architects say 'no', 64% of developers say 'no', and 73% of facilities managers/ officers say 'yes'.

iv)   Interest to take part in user feedback studies/ POE: 98% of architects say 'not interested', 96% of developers say 'not interested', and 92% of facilities managers/ officers say 'interested'.

It is strongly suggested by the survey that most of the practitioners in the Malaysian construction industry who are directly involved in the design and development of buildings (architects and developers) perceive user feedback studies for the evaluation of building performance (POE) as insignificant. The management team (facilities management) however acknowledges the importance of POE in the effort to achieve continuous improvement of building performance.

In terms of the knowledge on how to audit user feedbacks for the evaluation of building performance, it is clearly demonstrated by the survey that a large majority of the practitioners are unfamiliar with the method and technique to audit user feedback. 100% of the architects and developers, and 98% of the facilities managers/ officers are not familiar with what method to be used and how to translate the data into workable information for decision making.

4.0   Factors Mitigating Against POE

The lack of awareness and knowledge to audit user feedback as part of the effort to evaluate the performance of buildings are the main reasons why we lack information on how our buildings are actually performing. The reasons for the lack of awareness and interest to foster POE as part of the building design, construction and management process may differ from each group of practitioners. However, it has been suggested by Vischer (2002) that the factors that mitigate against POE for building performance evaluation are:

i)   Professional territory

No active building professionals seek to have their work judged by outsiders as part of a process over which they have no control, even if the goal is a better understanding of a situation and not a performance review of a participant.

ii)   Cost

The cost barrier is intrinsic to the structure of the real estate industry, namely, who pays for POE? POE is not built into the architect's fee, the construction bid, the move-in budget, or the operating budget of the building.

iii)   Time

Every new building project has a rushed and constraining schedule. Going back for a follow-up look at a building, however, is bound by the time pressures of new projects, and as a result, finds no place in the phases of a conventional building project.

iv)   Skills

Undertaking user feedback studies such as POE demands skills which are so broadly defined as the term itself has come to be applied to a wide range of activities, ranging from precise cost-accounting evaluations to technical measurements of building performance to comprehensive survey of user attitudes. This broad definition of skills means that no one individual of certain disciplines is likely to have all that are needed, therefore fall through the cracks.

5.0   The Need for Post Occupancy Evaluation

The benefits of incorporating user feedbacks formally and continuously in building performance evaluation are tremendous. Various researchers have acknowledged the advantages and importance of learning from the users. Studies in the USA indicated that buildings achieving better environmental performance have lower operating cost and that the customers respond positively to these improved condition and resulted in higher productivity level (McGrath, 2004)

By addressing customer-focused performance, the companies would be more likely to go further to satisfy customer's needs by understanding their customers' real requirements, and act on actual information flowing from the customers. (Kincaid, 1994). Since facilities are for people thus to sustain the habitats then, evaluation of those facilities based on user participation is the responsible thing to do (Anderson, 1992)

Building user's dictate the changes needed in the buildings to meet their objectives, which means that designers need to understand the business process of the building users to minimise conflicts. (Kaya, 2004). Business excellence is achieved through meeting client's needs in the practice of sustaining building life cycle. (Wyatt, Sobotka and Rogalska 2000)

User satisfaction is needed to understand the perception of the users, identify their needs, wants, requests, hopes, and to lower the gap between what the provider thought as being what the users want and what the users actually want. (Gerson, 2004). Building performance need to be measured whether it meets customers' satisfaction and needs for achieving continuous improvements (Becker & Sims, 1990). The opinion of as many occupiers of the building as possible would provide a greater depth of feeling for the building. (Brooks & Viccars, 2006)

The logic to implementing POE simply lies on the fact that the actual judges of the works of the architects, the engineers, the contractors, and all who are involved in the construction of a building and its counterparts are the occupants. We may admire a building for its beauty and symbolical design, or for the technology that it possesses, or for its efficiency and effectiveness in energy use. However, if the occupants are not satisfied or having difficulties in carrying out their daily operations due to discrepancies or defects in the building, it can be fairly said that the building and its builders have failed. What might be an award-winning building may actually function quite poorly in terms of the people who use it (Sanoff, 2000).

For several decades, POE has been applied in developed countries such as the U.S.A, Canada, Great Britain, Germany, New Zealand, and others (Voordt and Wegen, 2005). This could be attributed to the awareness that learning how buildings are performing from the perspective of the users is vital for continuous improvement of building performance.

The Building Research Establishment (BRE) 478 has recognised the benefits of POE as stated in Table 3.

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Table 3: Benefits of POE at Different Stages of Occupancy

Stakeholder	On Occupation, or within the first 12 months of occupancy	On annual basis	Prior to move
Benefits to the clients	▪ Ensures building provided matches design brief. ▪ Facilitates joint problem solving whilst the project team are still on board. ▪ Ensures building operates optimally from the outset. ▪ Ensures the impact on organisational performance is as intended	▪ Allows building performance to be maintained. ▪ Allows building performance to be benchmarked. ▪ Highlights areas where improvements could be made to reduce costs, improve environmental conditions, or modify the provision of facilities to meet changing business needs. ▪ Avoids complacency.	▪ Informs requirements for new premises. ▪ Prioritises funding allocation. ▪ Secures pre-move buy-in to planned changes, including culture changes to be facilitated by the new premises.
Benefits to the end users	▪ Ensures quality of the working environment is satisfactory. ▪ Ensures the understanding of the building and able to exploit the means to control their working environment. ▪ Ensures facilities provision is suitable.	▪ Ensures continuing satisfaction with the internal environment and facilities provision. ▪ Demonstrates the commitment of an organisation to providing staffs with a suitable workplace.	▪ Allows staffs to inform the brief of subsequent premises. ▪ Allows staffs to voice their concern.
Benefits to Facilities Managers	▪ Ensures they understand the building operation. ▪ Ensures they are aware of likely problem areas for subsequent monitoring. ▪ Enables them to discuss any problems with the design team.	▪ Allows the facilities team to interact positively and proactively with the end users. ▪ Allows the facilities team to prioritise their funding allocation. ▪ Allows the facilities team to demonstrate the value of their own	▪ Allows the facilities team to inform the brief for subsequent premises, avoiding past deficiencies.

		performance.	
Benefits to the project team	▪ Provides immediate feedback and the opportunity to resolve problems jointly in a mutually supportive atmosphere. ▪ Is a learning experience for all staffs within the organisation.	▪ The maintenance of ongoing customer relationships.	▪ The development of a better informed brief and subsequently smoother design process.

Source: Building Research Establishment (BRE) 478

The summary of the benefits of POE as stated in the Building Research Establishment 478 are as follows:

i. POE benefits all parties involved in the construction project; from the project team, the management team, the clients to the users.
ii. POE provides the opportunity for all parties to evaluate the building almost immediately, starting from the day of its occupation.
iii. POE promotes continuous evaluation and improvement.
iv. POE provides the opportunity to learn from past mistakes or deficiencies and promotes performance improvement for future buildings.
v. POE forms a complete collaboration of all the parties (project team, management team, clients and users) in the effort to build buildings that truly conform to the requirements of the users/ clients, and able to meet the changing demands of business trends.

6.0   The Need for Awareness and Knowledge on POE

The practitioners in the Malaysian construction industry and facilities management alike need to get closer to the users. It has been highlighted by practitioners that auditing user feedbacks for building performance evaluation poses issues pertaining to cost and time and above all, not stated as a requirement in any contract or policy. However, the complete cycle of the benefit should be put clearly into perspective. Though gaining profit is undoubtedly the main goal, learning from the users will promote continuous improvement of the buildings that we build. This in return will lead to the elevation of satisfaction, improvement of work efficiency, increased production, and of course luring more projects for the builders. Various countries are on the move to establishing POE

as a standard requirement in the building procurement process (Izran, Hakim, & Shardy, 2008). Perhaps, Malaysia should adopt similar movements in the future

Practitioners also state that in spite of understanding the concept of POE, they are unfamiliar with the methodology and how to translate the data gained from the survey into workable information. Most POE is carried as academic research and comprehensively discussed in journals and conferences. However, in the practical world of building design, construction, and management, most organisations have no established system for knowing how to process, direct, and act on the information they receive from POE (Vischer, 2002). Thus, it is imperative for a study to be undertaken to develop a framework of what parameters to be included in POE, what methodology to be used, and how to process the POE data into workable information, acting as a guideline for the practitioners in the Malaysian construction industry upon adopting POE as a tool for building performance evaluation. Learning from the extensive literature about POE, benchmarking POE practices in other countries, and deriving the most suitable POE framework in the Malaysian context will be of utmost assistance to shed light to the practitioners on how to carry out POE for continuous performance improvement of the buildings that they deliver.

7.0   Conclusion

This paper has endeavoured to look at the need to raise awareness on POE as an integral part of achieving continuous improvement of building performance in Malaysia. The construction industry in Malaysia needs a paradigm shift to become more aware and interested to learn from what has been delivered to the users. The literature findings have been articulate about the need to foster user feedbacks as an essential part of the building design, construction, and management process. Adopting POE enables practitioners in the construction industry to establish a true understanding of real building performance based on the experience of the occupants themselves. POE allows the buildings to 'talk' to the builders and managers through the occupants about how it is performing and how it can be improved. Various researchers and practitioners have acknowledged the significant building performance improvements that can be

achieved by fostering POE in building performance evaluation as a standard practice in the construction industry. However, POE is a mere tool to provide essential information for improved building performance. Without the awareness to use the tool, continuous improvement of building performance will only be an idea to be achieved.

There is also a knowledge gap about how to foster POE for building performance evaluation in Malaysia and further studies on developing a standard POE framework, what mechanism to be used, how it is to be implemented, who should be involved, etc., are inevitably needed.

8.   References

Anderson, C. (1992). Measuring Facilities Performance: A Participatory Approach to Post Occupancy Evaluation. *CFM Working Paper Series*. CFM 92/03.

Becker, F. & Sims, W. (1990). *Assessing Building Performance*. In: Becker, F. (ed) *The Total Workplace: Facilities Management and The Elastic Organisation*.Van Nostrand Reinhold. New York
Berita Harian, 15th August 2007. "*Pelan Kualiti Dapat Elak Projek Hadapi Masalah*".

Bordass, B. & Leaman, A. (2005), "Making Feedback and Post Occupancy Evaluation Routine 3: Case Studies of The Use of Techniques In The Feedback Portfolio", *Building Research & Information*, Vol. 33, No. 4, pp. 361-375.

Brooks, S.T. & Viccars, G. (2006). The Development of Robust Methods of Post Occupancy Evaluation. *Facilities*. Vol. 24. No. 5/6. pp 177-196

Eley, J. (2001), "How Do Post Occupancy Evaluation and The Facilities Manager Meet?", *Building Research & Information*, Vol. 29, No. 2, pp. 164-167.

Fleming, D. (2004), "Facilities Management: A Behavioural Approach", *Facilities*, Vol. 22, No. 1/2, pp. 35-43.

Gerson, R.F. (2004). *Mengukur Kepuasan Pelanggan*. Translated Version. Penerbitan Pelangi Sdn. Bhd.

Way, M. & Bordass, B. (2005). Making Feedback and Post Occupancy Evaluation routine 2: Soft Landings – Involving Design and Building Teams in Improving Performance. *Building Research & Information*. Vol. 33. No. 4. pp 353-360

Izran, Hakim, & Shardy (2007), Post Occupancy Evaluation: The Answer For The Sustainability of Malaysia's Built Environment, *International Conference on Built Environment in Developing Countries*, Universiti Sains Malaysia, 3rd-4th December 2007.

Izran, Hakim, & Shardy (2008), Fostering User Feedback In Building Performance Evaluation: The Need For A Paradigm Shift, *13th International Conference On ISO 9000 & TQM*, Subang Jaya, 26th- 28th March 2008.

Jaunzens, D., Grigg, P., Watson, M. & Picton, E. (2003), *Building performance feedback: getting started*, BRE Digest 478. BRE Bookshop. London. UK.

Kaya, S. (2004). Relating Building Attributes To End User's Needs: The Owners-Designers-End Users Equation. *Facilities*. Vol. 22. No. 1/10. pp 247-252

Kincaid, D.G. (1994). Measuring Performance in Facility Management. *Facilities*. Vol. 12. No. 6. pp 17-20

Mcgrath, A. (2004). High Performance Facilities. *FM*. Vol. 12 No. 1. pp 32-35

Preiser, W.F.E., Rabinowitz, H.Z. & White, E.T. (1988), *Post Occupancy Evaluation*, Van Nostrand Reinhold, New York.

Sanoff, H. (2000) An Analysis of Student Responses to Architectural Schools, Unpublished manuscript.

Voordt, J.M. & Wegen, H. B. V. (2005). *Architecture In Use: An Introduction To The Programming, Design and Evaluation of Buildings*. Architectural Press-Elsevier. Oxford

Vischer, J., (2002). *Post Occupancy Evaluation: A Multifaceted Tool for Building Improvement*, In *Learning From Our Buildings: A State of The Practice Summary of Post Occupancy Evaluation*, Federal Facilities Council Technical Report No. 45, National Academy Press, N.W., Washington.

Wyatt, D.P., Sobotka, A. & Rogalska, M. (2000). Towards A Sustainable Practice. *Facilities*. Vol.18. No. 1/2. pp 76-82

Zuriati Ashaari (2005). *Current Practice of Post Occupancy Evaluation In Facility Management Organisation of Malaysia*, Masters Dissertation, Universiti Teknologi Malaysia.