An Exploratory Literature Review of Post Occupancy Evaluation

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Abstract—This study examines previous literature on post occupancy evaluation, history, theories, benefits and approaches used in conducting POE. The aim is to synchronise the literature on this subject, thus helping the understanding of POE as an appraisal framework. This is because the concept of post occupancy evaluation (POE) has attracted much attention in recent years and that researchers and research bodies, be it corporate or government that try to develop residential buildings should begin with an understanding of the determinants of POE. The study is conducted with reference to existing theoretical literature, published and unpublished research. The study is mainly a literature review/survey on the determinants of POE. One of the primary findings emanating from the study reveals that if POE is not conducted for already existing buildings, chances are that the mistakes on a particular type of building may be repeated again with a prior knowledge of what need to be improved. The study contributes to this body of knowledge.

Keywords—Building performance, post occupancy evaluation, residential assessment

I. INTRODUCTION

Post occupancy evaluation (POE) is a general term for a broad range of activities aimed at understanding how buildings perform once they are built [1]. Over the years many theorists and practitioners have grown uncomfortable with the term “POE”. The literal meaning of the term seems to suggest that it occurs after people leave the building and it seems to emphasise evaluation done at a single point in the process. Despite the diversity of the practice, the term “post-occupancy evaluation” remains common for historical reasons and it will be used in this study. To be most effective building performance, evaluation must happen throughout the lifecycle of the building. In this guidance, the term POE is used as an umbrella term that includes a review of the process of delivering the project as a review of the technical and functional performance of the building during occupation.

This is because the concept of POE has attracted much attention in recent years and that researchers and research bodies, be it corporate or government that try to develop housing policies should begin with an understanding of the concept of POE. Conducting POE in residential buildings will assist with the knowledge base which will be utilised by the occupants of the residential complex to improve the use of student facility. The knowledge base that the POE provides, will serve as the benchmarks for continuous improvement, instead of waiting the Post Occupancy Phase to kick in. This study examines previous literature on post occupancy evaluation, history, theories, benefits and approaches used in conducting POE. The aim is to synchronise the literature on this subject, thus helping the understanding of POE as an appraisal framework. The next sections of the exploratory study examine the research methodology adopted and the general knowledge on POE together with the findings from the literature before conclusion is draw for the study.

II. RESEARCH METHODOLOGY

The research was conducted with reference to existing theoretical literature, published and unpublished literatures. The study presents a literature review on post occupancy evaluation (POE), with the specific aim of identifying building performances concept of POE as this has attracted much attention in recent years to researchers and research bodies (corporate or government).

III. HISTORY, DEFINITION AND EVOLUTION OF POE

Post occupancy evaluation actually originated from UK where the British Ministry of Education in conjunction with local governments first undertook evaluations of building in the post-World War II period [2]. POE have been used by number of researchers over the years as a tool for documenting, evaluating and improving a building as well as environmental condition [3]. Most researchers would appear to be in general agreement that POE should be an integral component of the building performance procurement process [4, 5, 6, 7, 8]. POE was derived from the “occupancy permit”, a document that is issued once the building has been inspected and is declared free from all defects and ready for occupation [9]. During the early years of POE, academics decided to research the topic in-depth to determine the effectiveness of
the POE because the profession of architecture had elected not to embrace POE as a field of study.

The idea of POE was established in relations to the problems arising from the building industry, more especially in the care facilities such as mental hospital, nursing homes, school residence and correctional services [9]. The rapid housing development in the Second world war has led to the adoption of POE in the built environment. Due to the urban renewal projects, many houses which were built in Northern America, has forced the designers to accommodate the need of the lifestyle of the occupants [9]. Having POE as a measuring tool in any building will be able to detect which elements in building performs or which elements in building underperforms and affecting the worker satisfaction and productivity [10].

According to Riley [9], POE is used to consider the extent to which a building meets the needs of its end-users while also recognizing ways in which design, performance and fitness for purpose can be enhanced. Presier [11], views post occupancy as a tool and system which allows facility managers to identify and evaluate critical aspects of building performance systematically, once occupied for a period of time, meets the intended goals and user-occupant needs. This system has also been applied to identify problem areas in existing buildings, to test new prototypes and to develop guidance and criteria for future facilities. The building should be designed with the aim of producing a high-quality interior environment so that the health and safety of the occupants are not compromised.

POE is the process whereby a building has to be evaluated in an accurate manner after it has been built and occupied for some time [12]. Kirk and Stirrett [13] described POE of a building as a formal study, that tests whether the building has met goals and objectives set forth in the original programme.

IV. POE AND BUILDING PERFORMANCE

Many organisations around the world are now adopting the POE as a tool for evaluating their building’s performance. There is, however, a challenge related to using POE as tool because at the end of the day it does not detect the exact problem fully in such a way that it can assist the client with the diagnosis of the problem [14]. Implementing the use of POE in an organization will help to identify a measurable link between the quality of the building and the performance outcomes of the occupants. It is crucial to conduct a POE because it indicates how well the building is performing in order to satisfy the occupants’ needs and achieve organizational goals [15].

POE was initiated because of the challenges and changes in the building environment due to the fact that even continual improvement was not sufficient to solve the problems that occupants face every day. POE will then assess to the responses of the occupants with regard to the residential environment where they live every day. The relationship between the building and its occupants must be understood by designers prior to designing the building in order to understand the impact that the building will have on the occupants with regard to workplace set-up, health and safety, etc. If the environment is not conducive to human health, it is going to have an effect on the efficiency of the building’s performance and the occupants’ satisfaction [16]. It is important to conduct a POE in the residential building or any other building so that the results can be used to gauge the level of satisfaction of designers, occupants and owners of the building, to determine whether the occupants are happy or not. As the purpose of the building is to serve the needs of the owners and it is critical that the building should be evaluated from time to time to ensure that it is serving its intended purposes. The building is an immovable asset, and it is affected by external factors such as exposure to the climate, which leads to the necessity for maintenance [14].

V. PRINCIPLES OF POE

On the basis that buildings are socially negotiated solutions to human needs for shelter (and support for operations and equipment), no objective method of evaluation can be a complete test of building quality. However, POE compiles the subjective opinions from the complete set of interest groups mainly from the building occupants’ [17]. The approach taken is to capture as many opinions as possible about the specific building, thus revealing the mostly issues with the state of the building from the users’.

VI. TYPES OF POEs

POE may be classified in three levels; The Indicative POE, Investigative POE and Diagnostic POE [18]. Indicative POE gives an indication of the success or failure of the overall building performance. By applying this method it is easy to collect the data, as one can quickly interview few occupants who will quickly give the results that one wants [18]. Investigative POE is once the problem has been identified; the POE will carry and start investigating to find out what the problems are. Once the process has been completed, the data will be presented for a solution. In the aspect of diagnostic POE, at this level, the evaluation will be focusing on the critical elements of the building such as the safety of the staircases, lighting and overcrowding in the building. Diagnostic POE is a comprehensive and very lengthy investigation that is done with care. After conducting this kind of POE, it may take some time to formulate and conclude its findings, probably months or years. The findings revealed by the evaluation will improve the performance of the building.

Furthermore, the three levels are each divided into three phases, namely planning, conducting and evaluation;

A. Planning the POE

During this phase, the main objective is to liaise with the client, whereby a scope of work would be clearly defined. Once such interaction has taken place with the client the evaluator has to check the feasibility study and plan the way forward. The planning phase is similar to the feasibility study
of the project, during which the concept and briefing of the project are outlined. The evaluation team has to establish with certainty that the client of the building is. Delegates from the building users must be included as part of the evaluation process, as in the past they were not part of the evaluation event. Evaluators will then determine the feasibility, based on the challenges that the building is facing [11].

The difficult part of completing this phase will depend on the resources that the landlord provides. Cooperation between the evaluator and the landlord is crucial at this stage, so that the evaluation challenges may be addressed and resolved. The research must be planned, based on the client’s instructions [19]. The most important part of this phase is the performance criteria that the evaluator needs to identify the methods of data collection. The POE team must identify and review the building’s performance, so that the strengths and weaknesses of the project may be outlined. Building performance elements such as health, safety, security, efficiency and cultural performance must be prioritised. A good working relationship between the evaluator and the landlord will assist the evaluator in having access to the design guidelines of the building concerned [11].

B. Conducting the POE

During this phase, the evaluator has to find out which data collection instrument is more appropriate to this kind of evaluation. The questionnaire method is more suitable when conducting the POE. In the case where data collection instruments are limited, the evaluator should be proactive in finding a way of communicating with building users. The POE team should be able to identify the building users and give occupants notice that the POE will take place. This will give the POE team experience in collecting data and analysing it. The real evaluation starts during this phase, when data collection must be monitored and managed. The data collection has to be monitored so that genuine results of the evaluation may be found. Useful and insightful findings will assist the landlord [19].

C. Applying the POE

Once the data has been analysed, the evaluator has to go back to the client and report the findings, which will form part of the basis upon which actions can be taken thereafter. A presentation report carries more weight than a written report. Once the findings have been presented, actions regarding the presentation report carries more weight than a written report.

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VII. METHOD FOR CONDUCTING POE

Methods for conducting POE will be governed by the requirements and objectives of the evaluation. Conducting POE may be very effective when one compares the previous results with similar kind of evaluation that one wants to conduct it now. Carrying out the POE may be very useful if the concerns related to the building and occupants are tabled. POE may be used as a strategic approach after evaluation and analysis of data to ensure that action plans are compiled to rectify past or current mistakes in respect of the building.

A. Applying POE

Applying POE involves reporting the findings, recommendation and planning and actions and reviewing the effect of the recommended actions. The reporting of findings depends on the purpose of the evaluation and the client. The purpose could be to identify problems and successful and unsuccessful performance in the facilities. The purpose of findings could also be to solve short-term problems by identifying and resolving minor building and space problems [2]. Findings could also focus on resolving major environment and space problems in a facility where, for example, extra rooms have to be added. Findings could also be used for information system and design criteria for databases (building configurations, location of activities, technical systems and user response). The purpose of this is to improve on the design of new settings [2].

VIII. BENEFIT OF POE

Through POE, designers can discover how similar buildings perform once they are in use, policy makers can also apply it to help in developing and improving on the existing programmes and projects being delivered. POE is also a valuable tool for assessing building quality, since building designers, owners and even the government, in the case of state subsidized buildings are held accountable for the success or failure of the building and policies creating the buildings. POE identifies ways people can use buildings and equipment more efficiently and more cost-effectively. POE also eliminates dysfunctional and seldom-used areas in a building and mistakes can be corrected in future design and policies [20]. The greatest benefits from POEs are determine when the information is made available to as wide an audience as possible, beyond the organisation whose building is evaluated, to all sector and construction industry. Information from POEs can provide not only insights into problem resolution but also provide useful benchmarking data to which other people projects can be compared [21].

IX. LESSON LEARNT FROM LITERATURE REVIEW

Lessons learnt from the study revealed that most organizations around the world are adopting POE as a tool for evaluating their building’s performance. Since the building is an immovable asset, and it is affected by external factors such as exposure to the climate, which leads to the necessity for maintenance; it is important to always evaluate a building because it helps the designers or stakeholders to dictate the problem affecting the building performance. Again, it is was found that conducting a POE in a residential building or any other building enables the building owners’ or the facilitating
management firms to gauge the level of satisfaction of designers because if the environment is not conducive to human health, this will impact the users’ efficiency and the eventual satisfaction with the building. Likewise, a typical POE evaluation serves the needs of the owners and it is critical that the building should be evaluated from time to time to ensure that it is serving its intended purposes.

X. CONCLUSION

Conducting a POE in an organization or residential building is beneficial by equipping it with valuable information that will help the executive managers or decision makers to assess the performance of the building. If the POE is applied correctly, the level of satisfaction for the occupants can easily be assessed. Having the POE in place will facilitate detection of the building’s defects as at early stage, and remedial action can be implemented as early as possible. It is imperative to conduct the POE process, as it will enhance the development of design standards that will allow occupants to carry out their duties comfortably in their building. Benchmarking of the existing residential complex will be used as a point of departure to identify the current performance of the building in relation to other relevant best practices in the commercial property market. Having POE as part of the organizational knowledge base will assist in the development of future projects. If POE is applied strategically, it will help the organization with regard to the building’s performance and the utilisation of energy in a more productive way. If the POE is applied in a more holistic way, this will assist the corporate managers to fully analyse the organisational/business needs, perceptions of building users and the economic evaluation any productivity including energy audits Future projects or buildings will be designed to accommodate the issues of safety, comfort, cost-effectiveness and sustainability.

REFERENCES