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Towards Co-Design in Post-Occupancy Evaluation (POE)



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Towards Co-Design in Post-Occupancy Evaluation (POE)

0. Foreword

This document formalises a rationale and methodology for user-centred post-occupancy evaluation (POE) in buildings. It contextualises concepts such as ‘shearing Layers’ (Brand, 1994)¹ and ‘temporal lenses’ (Saad-Sulonen *et al.*, 2018)² relevant to energy retrofit engagement. As the second deliverable, this document directly informs the third resource and output, ‘*User Guide for all Participants in Co-Operative Design Methodology*’. Section 1 foregrounds the conceptual framing for praxis relevance. Section 2 shows why POE is important; acknowledging the spectrum of its definition and contextualising the guidance document’s base rationale as understood through its historical roots. Section 3 identifies key relevances of POE to current architectural discourse. Section 4 ‘bridges’ these key relevances; situating the third resource and output within such discourse. Section 5 expands on how the POE is operationalised as methodologically grounded within the literature. Lastly, this document concludes with Section 6: Final Notes.

Keywords:

post-occupancy evaluation (POE), participation, temporality, pragmatism, mixed-methods research (MMR)

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1 INTRODUCTION : PRAGMATISM AS POINT OF DEPARTURE

Approaches to incorporating wider stakeholder participation within projects, including but not limited to co-design, have long been understood as restricted by pressures of pragmatic efficiencies and organisational concerns (e.g. Clement and Van den Besselar, 1993).³ Unlike other research epistemologies, pragmatism is unique as it is not committed to either of the two opposing schools of thought (e.g. objectivist and subjectivist, as in Phillips & Burbules, 2000).⁴ This is important as pragmatist research can therefore allow multiple approaches and methods to be used in the same research project to best serve a research question. As (retrofit) building projects, their approaches, and breadth of multiple stakeholders are comprehensive by their nature, pragmatism demonstrates itself as a core conceptual framing of the the co-design guide output as the third and last resource, and hence this methodological review. Indeed, the pragmatist researcher is concerned with the efficacy and value of the research outcomes for the larger community (Kaplan, 1964).⁵ The use of post-occupancy evaluation (POE) facilitates this, as it *“generates recommendations based on all stakeholder groups’ experiences of subject buildings’ affects on productivity and wellbeing”* (Preiser et al., 2015).⁶ Pragmatist researchers do not ascertain unified world truths (Cherryholmes, 1992)⁷ but rather *“would simply like to change the subject”* (Rorty, 1979; cited in Creswell, 2007).⁸

Owing to both the technical and experiential dimensions of (retrofit) building projects, this review engages a mixed-methods approach (i.e. quantitative and qualitative) to contextualise these multi-stakeholder dimensions. This document therefore draws on a diverse range of literature towards understanding as knowledge claim based on *“practical problem solving and real world research”* (Morgan-Brown, 2013).⁹ Through tracing and formalising the evolution of POE, extended impacts of energy retrofit across time can be assessed in a holistic way; allowing space for significances often not captured during front-end stages of (retrofit) building projects to be revealed. For this reason, the project’s praxis must be considered as a ‘whole’ — with the discussion of any of its findings reflecting this ‘totality’ of evidence (Sartre, 1960).¹⁰

2 TYPIFYING POE : RATIONALE AND ROOTS

2.1 Definition and Rationale

Brown (2018)¹¹ assesses the place of POE in responsible architecture, acknowledging that — best intentions aside — “*very few [architects] are equipped with the comprehensive knowledge and tools to critically understand the social impacts and performance of the architecture they produce*” and that “*the buildings that architects design do not always function and perform as intended, or even as they should*”. (Brown, 2018)¹². As a device for offering formal insight into these underrepresented temporal spaces, POE yields significant potential for evaluating the impact of projects and engagements with them, thereby informing future projects for both service providers and communities alike.

As is the case with the subject matter of ‘participation’ in the literature (as in the first deliverable), there is a notable diversity as to how POE is defined. The Research Steering Group of the Royal Institute of British Architects (RIBA, 1991: 191)¹³ defines POE as “*a systematic study of buildings in use to provide architects with information about the performance of their designs and building owners and users with guidelines to achieve the best out of what they already have*”. Meanwhile Preiser *et al.* (1988)¹⁴ broadly define POE as a “*process of systematic data collection, analysis, and comparison with explicitly stated performance criteria pertaining to occupied built environments*”, whilst Wolfgang Preiser (1993)¹⁵ suggests it simply as a “*means of collecting data on which to base future programs*”. Hadjri & Crozier (2009)¹⁶ acknowledge Friedmann *et al.*’s (1978: 20)¹⁷ anthropological approach when defining POE as “*an appraisal of the degree to which a designed setting satisfies and supports explicit and implicitly human needs and values of those for whom a building is designed*”. Variations of POE are also employed under alternative acronyms and focuses, including PROBE (Cooper, 2001)¹⁸, BPE (RIBA *et al.*, 2016)¹⁹, FPE (Brown, 2018)²⁰, UDE (Preiser, 2002: 9)²¹, BUS (Szigeti and Davis, 2002: 47)²², BASE (Warner & Reid Associates, 2001: 16)²³ and LEAF (Akman, 2002)²⁴ (see Appendix: Related Practice Evaluation Acronyms for a listed overview of further examples as identified in the literature).

Notwithstanding the above and their contexts, Hadjri & Crozier (2009)²⁵ suggest a more adaptable definition of POE; as a *“method of gathering and disseminating information that is of value to all stakeholders within a building life cycle, with specific elements of this information being of benefit to particular stakeholders”*. In line with the recognition of learning cycles (Section 3: Extending Rationale), building values (Section 4.1: Addressing These Gaps) and expanded inclusivity of stakeholders (Section 5.2: A + B: Partitioning the Walking Interview), this deliverable foregrounds this more expansive and recently posited description as offering the most applicability for informing the third and last resource, the co-design guide: *‘User Guide for all Participants in Co-Operative Design Methodology: Approaching Sustained Co-Design in Building Retrofit Projects’*.

2.2 Historical Roots

To understand the relevance of POE to the third resource and output, it may be useful to delineate its historical development before reviewing the residual state of practice. Whilst the navigation is limited to extant literature for formal POE, it is acknowledged that *“POE was probably carried out 1000 years ago, but informally”* (Akman, 2002)²⁶. Contemporary POE is credited as having its roots in the 1960’s (Cooper, 2001)²⁷, the same time-space in which contemporary participatory and co-design literature is rooted (Robertson and Simonsen, 2012; Blundell-Jones, 2005)²⁸. POE methodology was readily adopted due to a lack of ‘scientific exploration’ of projects’ technical successes and failures (Riley *et al.*, 2009)²⁹. These roots were academically based with *“the growth of research focusing on the relationships between human behavior and building design, which led to the creation of the new field of environmental design research...”* (Preiser *et al.* 1988: 8)³⁰. Despite the myriad of singular case study evaluations, the 1970’s brought about an increase in multi method POEs (e.g. interview, survey, observation), with the first dedicated publications on POE (Akman, 2002)³¹. While such evaluations during the 1970’s and 80’s were notably technophilic in their nature, recent developments have expanded POE to consider non-technical factors (Hadjri & Crozier, 2009)³² emphasising *“more holistic and process-oriented evaluation”* (Preiser, 2002: 9; 1995, 2001)³³.

By the early 1990's, alongside environmental psychology, POE faded from formal architectural education such as in the UK (Cooper, 2001: 160; Pol, 1993: 39)³⁴. The 'the deepest disillusionment' was felt due to what Canter describes as the 'feedback misconception'; arguing that "*social science [should] become an integrated part of design' because, operating from outside the design process, 'post occupancy evaluation can do very little to influence the use of existing buildings and probably even less to future building designs'"* (Canter, 1984: 43; quoted in Cooper, 2001)³⁵. Despite this, POE was resurrected in the newly emerged facilities management discipline (e.g. Barrett, 1995: 99; Alexander, 1996: 99 — as identified by Cooper, 2001)³⁶. Through this, POE emerged as its own discipline, creating the evolution for cross-sectional studies in the field of construction and design (Riley *et al.*, 2009)³⁷.

However, this success has been argued as short-lived in the profession, with its implementation declining due to "*the associated fees, insurance, liability and its failure to be seen as an architect's responsibility"* (Cooper, 2001: 159; quoted from Brown, 2018)³⁸. As "*clients were not particularly agreeable to paying additional costs for the POE service"* (Preiser and Vischer 2005)³⁹, the result was the removal of 'Part M: Feedback' from the RIBA handbook. POE shifted to the academic sphere again, progressing from a one dimensional feedback process to a multidimensional one (Hadjri & Crozier, 2009)⁴⁰, with the aim of expanding the availability of scientific knowledge (Cooper 2001)⁴¹. Indeed, it is only recently that POE has since been reemerged in formal practice, with POE either embedded across the current RIAI plan of work (e.g. RIAI, 2021: p.10)⁴², explicitly identified as a stage in the RIBA plan of work (i.e. Stage 7: Use in RIBA, 2020: p.68)⁴³, and even dedicated documents and schedule of activities for POE/BPE ['Building Performance Evaluation', see Appendix for further related practice evaluation acronyms] (RIBA *et al.*, 2016; RIBA, 2016: pp.8–11)⁴⁴. This further foregrounds the significance of POE as both an *applied* research, and a practice itself. However, despite this recent formal reemergence, there still remains a residual gap between aspired practice where extant POE knowledge is predominantly located, in addition to wider practice considerations (Section 3.1).

3 EXTENDING RATIONALE : RESIDUAL PRACTICE (GAPS)

3.1 Residual State of Practice

This shift, despite developmental benefits, has yielded notable practice gaps; where for some time POE was not commonplace in architecture practice and design (Hay *et al.*, 2017; Hadjri and Crozier, 2009)⁴⁵. Zimmerman and Martin (2001)⁴⁶ attest to this deficiency. As quoted by Frank Duffy, theorist of change rate in buildings, *“It’s got somewhat trapped in the academic field, I’m afraid”* (quoted in Brand, 1994)⁴⁷. Despite the (limited) formal reflection and informed improvement between design acts that do exist (Kieran, 2007)⁴⁸, POE’s impact in expanding disciplinary knowledge is still *“inconsequential”* due to its lack of dissemination (Dulaney, 2010)⁴⁹. Even within the academic sphere, POE studies *“commonly lie unread on researchers’ shelves, or are published in academic journals infrequently consulted by practitioners”*. (Vischer and Zeisel, 2010: 57)⁵⁰ where *“there is little public accounting”* (Brand, 1994)⁵¹. This is the same accountability that could otherwise have been upheld, practiced and reflected upon by practitioners, and potentially wider stakeholders, through engaging with such studies.

The reasons for this ongoing lack of POE adoption that existed, and its associated lack of dissemination, are well documented (e.g. Hadjri & Crozier, 2009)⁵². These ranged from *“cost, defending professional integrity, time and skills”* (Vischer, 2001: 23)⁵³ to *“fragmented incentives and benefits within the procurement and operation processes, lack of agreed and reliable indicators, potential liability for owners, exclusion from current delivery expectations [and] exclusion from professional curricula”* (Zimmerman and Martin, 2001: 168, also cited in Hadjri, Karim & Crozier, 2009: 30)⁵⁴. Despite recent formal reintegration into practice recommendations (e.g. RIAI, 2021: p.10; *Stage 7: Use* in RIBA, 2020: p.68)⁵⁵, many of these considerations still speak to current practice pragmatics. Additionally, Jaunzens *et al.* (2001)⁵⁶ challenge the previous status quo; who, following investigation, showed many of these reasons for the lack of POE held originally were unfounded. With POE’s adoption still recently low, a much more fundamental issue of the orientation of architecture is advocated (Roberts, 2001)⁵⁷; something much less incentivised by technical resolutions but instead markedly

pragmatic: a lack of obligation to act on findings unless so promoted by a client — *“a situation that would not be tolerated in any other area of manufacturing activity”* (Roberts, 2001)⁵⁸. It is this underlying orientation that is compounded by the aforementioned *“culture of fear, blame and conflict”* (Hadjri & Crozier, 2009; Jaunzens, 1999: 1)⁵⁹ and decline of POE in architectural education (e.g. as in the UK by the early 1990s, Pol, 1993: 39)⁶⁰.

However, most clients *“do not have the time or the resources to engage with the full complexity of the construction industry’s supply chain”* (Roberts, 2001)⁶¹; a testament to building projects’ failures to address their full intentions being due to the complex nature of the stakeholders involved (Zimmerman and Martin, 2001)⁶². This fundamental misalignment exacerbates the already existing *“neglect of issues of social and cultural value”* (RIBA et al., 2016)⁶³ that caused the misalignment in the first place. Notwithstanding recent reintegration into formal practice, what is still necessary is the adoption in a standard practice is a critical engagement of multiple stakeholders for the social viability of a design towards *“what the social implications are for all those who will experience it”* Brown (2018).⁶⁴

TABLE 3.1 : A NON-EXHAUSTIVE LIST OF POE DEFICIENCY CONSIDERATIONS

Deficiency and/or Consideration	Source
• Lack of disciplinary knowledge (research and industry) due to lack of dissemination	Dulaney (2010); Hadjri, K. & Crozier, C. (2009).
• Most extant POE published in academic journals infrequently consulted by practitioners	Vischer and Zeisel (2010: 57)
• Cost of POE (time, skills, economic)	Vischer (2001: 23)
• Lack of resources by clients, especially in proportion to construction industry’s supply chain complexity	Roberts (2001)
• Defence of professional integrity (related to emergent cultures of fear, blame and conflict)	Vischer (2001: 23); Hadjri & Crozier, 2009; Jaunzens, (1999: 1)
• Potential liability for owners	Zimmerman and Martin (2001: 168); Hadjri, Karim & Crozier (2009: 30)
• Relative lack of formal integration into mainstream educational curricula	Pol (1993: 39)
• Fragmented / lack of clarified incentives in procurement	Zimmerman and Martin (2001: 168); Hadjri, Karim & Crozier (2009: 30)
• Lack of agreement of reliable indicators, especially by all stakeholders involved	Zimmerman and Martin (2001: 168); Brown (2018)
• Relative lack of obligation to act on findings unless promoted by client compared to other ‘manufacturing’	Roberts (2001)

4 ADDRESSING : LOCATING POE IN THE PRACTICE CONTEXT

4.1 Addressing The Gaps

Effectively addressing the deficiency in engaging stakeholders (Table 3.1) requires the concept of practical completion to be revisited, abandoning *“the idea that buildings are ready for use when they are physically complete”* (Bordass, 2000: 2)⁶⁵. Indeed, by marrying the well-established and systematic POE methodologies with social factors (e.g. wider stakeholder groups’ participation and engagement) would allow for considerably greater critique of their architectures (Brown, 2018; Hay *et al.*, 2017)⁶⁶. In departure from the early technocentric approaches to POE (Schon, 1985; Cooper, 2001)⁶⁷, engaging architecture as a process provides a way of linking results from previous methods (e.g. surveys) to wider social, economic, political and cultural factors (Pol, 1993; quoted from Roberts, 2001)⁶⁸. After all, the *“propensity to avoid moral considerations, to restrict ourselves to issues of profit and loss — economic questions in the narrowest sense — is not an instinctive human condition. It is an acquired taste”* (Judt, 2015)⁶⁹.

However, as identified by Akman (2002)⁷⁰, a problem exists in discussing *values* within technical aspects of buildings, especially when they need to be measured. *“Therefore, for a reliable evaluation, we need all kind of values to be put in measurable units, including social, perceptual, cultural and aesthetical issues, however difficult this might be”* (Akman, 2002)⁷¹. Brown (2018)⁷² acknowledges the difficulty in evaluating buildings through experiential metrics that were not explicitly used during inception. However, research that does not claim itself as an isolated evaluation in itself, but as a *contextualisation* of prior measurements and understandings may resolve this difficulty, representing a departure from this limitation. As already understood from the literary landscape of the first deliverable ‘participation’, as a contextual matter, necessitates this contextualisation — these relationships of participation do not take place in a vacuum (Minkler & Wallerstein, 2003)⁷³.

There is established acknowledgement of the practical benefits of engaging wider stakeholder groups within practice settings in general. *“Participation can provide a source of information, generate new ideas for service-delivery, and build support for implementation”* (Checkoway, 1998 p.770)⁷⁴. However, despite this, an urgent question from the architecture discipline is how to collate such POE research in a way that all [stakeholders] can benefit from (e.g. RIBA *et al.*, 2016)⁷⁵. For this, there is further increasing evidence that the incorporation of feedback loops following project evaluations help deliver better [building] performance (RIBA *et al.*, 2016)⁷⁶. As such, the opportunity for (co)contributing such learning loops (Zimring, 2001, Bordass *et al.*, 2001)⁷⁷ is explicitly encouraged with the view towards informing future projects.

4.2 ‘Building’ Modes of Engagement

The building (or retrofit) designs may be understood as a scientific hypothesis, with their subsequent construction and POE’s understood as the associated testing and learning process. However, it has been considered that the significant difference between scientific and design research *“lies in the repeatability of experiments, and in the full disclosure of data and methodology. Architects, and indeed other designers, do not habitually share such details...”* (Weinstock, May/June 2008)⁷⁸. The consequence of this is that design research has remained in the realm of personal or proprietary knowledge development — rather than the generation of disciplinary knowledge (Dulaney, 2010)⁷⁹. Dulaney’s recognition of the need for credible research defines a notable practice orientation for any worthwhile POE; to bring personal and proprietary knowledge generated through building (retrofit) designs and evaluations into the realm of disciplinary knowledge. As originally described by Brand (1994), *“Buildings loom over us and persist beyond us. They have the perfect memory of materiality.”*⁸⁰ As such, buildings — embedded in time — are layered by different rates of change (Brand, 1994)⁸¹. Anchoring this disciplinary orientation, the building itself provides these temporal layers; the ‘missing link’. (Sanoff, 1992: 31; Brand, 1994)⁸².

Frank Duffy posited a competent building as comprising “*several layers of longevity of built components*” (quoted in Brand, 1994)⁸³. Brand (1994)⁸⁴ expands on Duffy’s component layers for a general-purpose 6-S sequence: *Site* (i.e. geographical setting), *Structure* (i.e. load-bearing elements), *Skin* (i.e. exterior surface), *Services* (i.e. wiring, plumbing, HVAC, moving parts such as elevators — the ‘working guts’), *Space Plan* (i.e. interior layout; where walls, ceilings, floors and doors go) and *Stuff* (i.e. furniture, appliances, day-to-day objects). It is noteworthy that this order is followed in construction in real *time*, if not in the preceding design also. Each of these components evolve at different timescales in different ways. The methodological relevance for this in energy retrofit building engagement is nested in Duffy and Brand’s alignment of the time-layering with O’Neill’s *A Hierarchical Concept of Ecosystems*; echoes ‘ecosystems’ of participation in the co-design literature (Deliverable 1). O’Neill’s argument is that ecosystems (e.g. participation) could be better understood by observing the rates of change of different components (O’Neill *et al.*, 1986; Brand, 1994)⁸⁵. Despite its potential as a viable and powerful socially critical tool (Zeisel 1984; Leaman *et al.*, 2010)⁸⁶, traditional technocentric POE has not adequately integrated socially critical aspects of the human–environment relationship; contributing to a cycle where social conflicts are rarely, if ever, resolved (Brown, 2018)⁸⁷. By establishing a POE that engages social performance, the conventional ‘concrete’ (Cele, 2006)⁸⁸ components of POE can be bolstered — where it can finally engage service providers, community users, wider stockholder groups and the relationships between them at their own levels of complexity.

5 OPERATIONALISING THIS POE : MODES OF ENGAGEMENT

5.1 Framing Post-Project Engagement

In addition to increasingly more forms of energy technologies and their engagement emerging, recent ‘global turning points’ (e.g. Davies, 2020)⁸⁹ are beginning to echo critiques of the role of architecture in the world (e.g. Tipton, 2020; Fisher, 2006)⁹⁰ where different patterns of working, building and learning will have to be accommodated (Malleon; RIBA, 2020)⁹¹. For this, knowledge of the true impact of stakeholder engagement in wider contexts is critical, for which a contextually engaged POE can offer. Amidst the literature’s noted over-emphasis of ‘front-end’ participation in the literature (Deliverable 1, e.g. Cleaver, 1999: p.597)⁹², by considering that participation can be sustained or emerged in a post-project future (Simonsen and Herzum, 2008; 2012)⁹³, infrastructure for future action, artefacts and systems (Saad-Sulonen *et al.*, 2018)⁹⁴ can be laid through accommodating post-project (remote) engagement. In short, regardless of the context for building evaluation, energy retrofit or not, *“If you want a building to learn, you have to pay its tuition”* (Brand, 1994).⁹⁵

A range of POE methods exist towards a multitude of evaluative criteria (e.g. see Appendix: Related Practice Evaluation Acronyms for further reference). Bordass and Leaman (2005: 350) noted that the US Federal Facilities Council (2002) attempted to reconcile such POE approaches into a single, preferred methodology. However, *“such an all-encompassing methodology is now regarded as impossible, as it ignores the specific contexts, needs and resources of the broad range of cultural climates in which POE is utilised”* (Hadjri & Crozier, 2009)⁹⁶. Instead, a *“portfolio of techniques”* is recommended; that can be taken off the shelf and situationally applied (Leaman and Bordass, 2005)⁹⁷. In POE, *“it is necessary to focus on the most relevant issues, rather than to attempt to analyse everything and face an overload of data”* (Hadjri & Crozier, 2009)⁹⁸. In light of this, relevance can be drawn from extant literature on ‘new’ methods such as the walking interview, located predominantly within geographical literature (e.g. Anderson, 2004; Evans & Jones, 2011; Holton & Riley, 2014)⁹⁹. With a notable

increase in their use in recent years (Butler & Derrett, 2014; Carpiano, 2009; Clark & Emmel, 2010; Hall *et al.*, 2006; Jones *et al.*, 2008; Kusenbach, 2003)¹⁰⁰, such ‘new’ methods motivate and enable different individuals to participate and share their experiences (Trell & Van Hoven, 2010)¹⁰¹ — the key for understanding, and consolidating, measured and holistic experiences necessary for “*a few, carefully selected and identified indicators*” (Vischer, 2001: 37)¹⁰².

Indeed, POE recommendations reiterate the need to balance QUAN and QUAL datasets (Vischer, 2001, p. 33; Hadjri & Crozier, 2009)¹⁰³. Bechtel (1997: 311–312)¹⁰⁴ acknowledge a middle position (e.g. mixed methods) where “*POE evaluates both the design and the human needs in relation to each other*”. In the context of wider POE approaches, the mixed-methods approach can therefore be understood as ‘indicative’ (Preiser, 1995: 21; Preiser *et al.*, 1988)¹⁰⁵; the criteria of which is to simply identify intended and unintended patterns of use. These identified elements can simply be mapped against previous results towards informing future projects of the same type. In consideration of how POE methods can be stretched to embrace broader and longer-term building impacts (Duffy & Rabeneck, 2013)¹⁰⁶, and speaking to the feedback loops necessary for addressing aforementioned practice gaps (Section 4.1), this deliverable advances two ‘light-touch’ POE cycles: Cycle A: Survey (Section 5.2), and Cycle B: Video Building Walkthrough (Section 5.3).

5.2 Cycle A: Survey

As reminded by RIBA *et al.* (2016)¹⁰⁷, POE does not have to be complicated or expensive, where “*the information gained from a light touch POE, exploring one simple issue or question, can be of great value*”. Similar to any mixed methods approach to multi-stakeholder research, surveys offer a good starting point, but not a finishing one. As a familiar and accessible mode of engagement, the survey is thereby foregrounded for Cycle A — the objective of which is to simply assess built project performance in relation to stakeholder groups’ decisions and inputs. The survey results can enable a comparative list to be drawn between them and any

initial measurements and understandings; the aforementioned criteria of which is to simply identify intended and unintended patterns of use for comparative evaluation. It is understood that inclusion of multiple stakeholder groups should be considered, *“especially the people who clean, service, or repair the building and know its failures all too well”* (Brand, 1994)¹⁰⁸.

As a well-established technique for attaining demographic data and user opinions (Rogers *et al.*, 2011)¹⁰⁹, surveys offers the advantage of engaging multiple participants in unison; suitable for the first POE ‘probe’, and can provide important additional data (Raisio & Ehrström, 2017)¹¹⁰. To achieve this, the survey is encouraged to be relatively short. According to Oates (2006: 221–222)¹¹¹, questions should be brief, relevant, objective and specific. This reasoning is echoed by Cohen *et al.* (2001: 89)¹¹² who warn of *“data bloat”*, whereby such surveys have *“too much data and not enough time to process the information for meaningful analysis”* (Hadjri & Crozier, 2009)¹¹³. Preconceived categories are not encouraged to be used in the POE in order to remain open to themes that may emerge after including users’ voices and inputs for any initial impact assessment. Examples of emerged themes could range significantly, whether economic (e.g. education, employability), social (e.g. connections, quality of life), environmental (e.g. conditions and experience of this), technical (i.e. physical adaptations, structural, material resilience), and even overlaps between them — thereby preserving a more holistic and accurate evaluation. In light of this, surveys are encouraged to be relatively short with a small number of open-ended questions. An example of this is the *‘Five Finger Feedback’* design thinking method (Table 5.2), which places explicit emphasis on the wider call for *“a few, carefully selected and identified indicators”* (Vischer, 2001: 37)¹¹⁴, with each question intentionally open to ease interviewee response (Evans & Jones, 2011)¹¹⁵. Additional questions can also be invited to be included in the POE such as by building users, local community, regulators and ‘facilitators’ (see next paragraph). Importantly, each question can also include a sub-question that qualifies the reason ‘why’ behind each answer (Table 5.2). Each answer can also be given a quantitative scale (e.g. 1–10) to indicate perceived importance of each insight, and hence measured value, by each cycle participant.

TABLE 5.2 : ‘FIVE FINGER FEEDBACK’ QUESTIONS (CYCLES A & B)

- **Question 1:** What went well?
Why?
 - **Question 2:** What could be improved?
Why?
 - **Question 3:** What went wrong?
Why?
 - **Question 4:** What would we like to keep?
Why?
 - **Question 5:** What did not get enough attention?
Why?
-

The participants in the POE cycle can be engaged, either in-person or remotely, by dedicated ‘facilitators’; dedicated independent parties who can create a relaxed and accessible atmosphere where POE participants can feel comfortable when sharing information and voicing feedback through their observations, perspectives and lived experiences. Online platforms may offer opportunity for more regular engagement with wider stakeholder groups, also offering potentials for automatically tabulates results with comparable tables and illustrations. Following this ‘light touch’ (RIBA *et al.*, 2016)¹¹⁶, the POE can proceed to the second cycle; the ‘Video Building Walkthrough’ (Section 5.3).

5.3 Cycle B: Video Building Walkthrough

Stevenson and Leaman, recognised as two of the world’s foremost experts in the formal field of POE (Brown, 2018)¹¹⁷, state that *“In building performance work, many such [social] considerations are hidden, taken for granted, or just too difficult to handle, so they are put on the side. The pursuit of quantification obscures qualification”* (Stevenson and Leaman, 2010)¹¹⁸. More than that, many of the most under addressed POE questions are not necessarily explored in a user survey (i.e. Cycle A). Such topics include the image of the building, self-image as reflective in the building, and emotive qualities of architectural spaces

(e.g. simply how the building is perceived as welcoming or uninviting) (Stevenson and Leaman, 2010; Brown, 2018)¹¹⁹. In explicit recognition of such POE limits in Cycle A: Survey, Cycle B offers expanded utility in engaging building evaluation. Preiser (1995: 53)¹²⁰ suggests that this type of in-depth POE produces “*high validity and generalisability of data collected... (that has) the potential of being transformed into guidelines*” for use in wider industry practice. (Remotely) integrating a video-recorded building walkthrough (RIBA *et al.*, 2016)¹²¹ element of what de Leon and Cohen (2005)¹²² call ‘walking probes’, this POE cycle again includes the aforementioned dedicated ‘facilitator’ who can facilitate a connection between the building, the community users, and wider stakeholder groups/partners. This enables the aforementioned remote/digital infrastructure (Section 5.1) to provide access to the local community’s attitudes and knowledge about their environment (Evans & Jones, 2011)¹²³ and their connections or alienations to the social networks within it (Clark & Emmel, 2010)¹²⁴. This Video Building Walkthrough, as a form of walking interview, can be understood as an instructive concept to “*operationalise the emergent whole*” (Raisio & Ehrström, 2017).¹²⁵

The Video Building Walkthrough can be operationalised through video-recorded building walkthroughs with community members/building users. The walk-through is not considered representative of everyday routines but rather indicative of how the community think about each case project itself. For this reason, the route, length, time and what is shown are encouraged to be decided by the interviewees (Clark & Emmel, 2009, 2010)¹²⁶. However, as certain elements are relevant to earlier results or measurements, the facilitator could be supplied with a ‘Walking Interview Pack’ – a simple document with consent form and short open-ended questions list. These questions can be the same as in Cycle A: Survey to allow comparison to be made across POE cycles, and contribute towards the same insights. However, the facilitator will be enabled to freedom to ask *ad hoc* questions also, as is important in such a method (Carpiano, 2009)¹²⁷.

For this necessary focus on the aforementioned “*few, carefully selected and identified indicators*” (Vischer, 2001: 37)¹²⁸, as well as the time consuming nature of a walking interview

(Trell and Van Hoven, 2010)¹²⁹, the number of videos recorded is encouraged to be relatively low. This can encourage a “small number of places with revealing stories about each” (Evans & Jones, 2011)¹³⁰. Additionally, there are values that can only be acquired on location, through first-hand experience (Raisio & Ehrström, 2017)¹³¹. Examples include “*more direct modes of experience*” (Tuan, 1975: 151; Thrift, 2008; 2009)¹³² (e.g. smells can elicit memories). Stakeholder groups who are not on-site during the building walkthroughs necessarily give up such personal benefits; enabling remote engagement to also transition power balance towards community participants. By transferring such agency to the community, reliance on external support is reduced. The walk therefore enables the interviewee participant to be regarded as the expert in their geographical area (Kinney, 2017)¹³³ and to “*be in charge*”, with the facilitator (and extendedly the researcher) being the one “*going along*” (Carpiano, 2009: 263; Trell & Van Hoven, 2010)¹³⁴. Indeed, “*in any community there are people who can provide historical perspective, valuable insights into how the area functions, and an understanding of critical issues*” (Placemakingchicago.com, 2020).¹³⁵ By doing so, Cycle B stays true to shifting power imbalances, as intended in the walking interview method in the first place (Kinney, 2017)¹³⁶. The information shared in both POE cycles can then be analysed by identifying any themes that may emerge from the information shared — enabling a framework through which project comparisons, learnings and formal feedback loops for future project practice can be built and iterated upon.

Despite the relative accessibility of the POE cycles, a number of projects that employ new methods of engagement such as the walking interview have made little or no attempt to map the data (Anderson, 2004; Clark & Emmel, 2008; Hall, Lashua, & Coffey, 2006; Ingold & Lee, 2008; Kusenbach, 2003; Moles, 2008)¹³⁷. With the aid of the dedicated ‘facilitator’ in Cycle B: Video Building Walkthrough, such mapping could be achieved through additional mediums such as photography — offering additional relevances to emerging conceptualisations of ‘post’-project engagements such as through ‘temporal lenses’ (Saad-Sulonen *et al.*, 2018).¹³⁸

5.4 Photography & The Temporal Lens

Indeed, “as long as the focus is not on the long term viability of the product [i.e. building], all issues of the efficiency and efficacy of participation in design are essentially moot if not irrelevant” (Reich *et al.*, 1996).¹³⁹ Cycle B built on the walking interview as a ‘new’ method — such as those used by social scientists and (human) geographers (e.g. Anderson, 2004; Carpiano, 2009; Kusenbach, 2003; Reed, 2002)¹⁴⁰ — can be successfully combined with photography to yield new insights (e.g. Kinney, 2018; Cannuscio *et al.*, 2009)¹⁴¹. Photography is thereby foregrounded as part of Cycle B to visualise and verify the design elements or programmatic spaces expressed by the participants throughout the POE, as well as allowing further reference for future projects. After all, “much of our knowledge about the world, and consequentially about our places, is built on the visual” (Trell & Van Hoven, 2010; Prosser, 1998; Pink, 2007; Edwards & Bhaumik, 2008)¹⁴².

As recognised by Brown (2018)¹⁴³, however few, there exist both theoretical and empirical research examples that markedly demonstrate the relationship between architectural aesthetics and social attributes (e.g. Sanoff 1970; Proshansky *et al.* 1983; Valera and Guardia 2002; Lipsitz 2007; Brown 2016)¹⁴⁴. This is relevant to the POE as “meanings and aesthetics are not separate functions, [but that] appearances can draw people in or repel them” (Preiser and Nasar, 2007)¹⁴⁵. In standard interview settings, the absence of ‘layers’ of place (experience) may be lost to the production of knowledge (Trell & Van Hoven, 2010)¹⁴⁶. Photography could thereby serves as a sufficient means of illuminating elements of the (retrofit) building embedded in time — marking the transition between the physical and social; the ‘concrete’ and ‘abstract’ (Cele, 2006)¹⁴⁷ aspects of [spatial and temporal] place. By including small details of a building that represent the “event-ness of the world” (Thrift, 2008: 12)¹⁴⁸, the small details that constitute the lived experience of the POE participants may be understood.

The dedicated facilitator can be requested to facilitate in-situ photos by each Cycle B: Video Building Walkthrough participants — demonstrating both ‘elements of significance’ (such as those identified by the POE participants in Cycle A: Survey), as well as context and use. This marked transition point through the photographing of “speech objects” in the building (Evans

and Jones, 2011: 849–858)¹⁴⁹ marks an important transition point for the project learnings, relating back to the idea of ‘problem transparency’ (Section 4.1), and communicating the POE learnings in a form that can be more easily understood and used (Vischer and Zeisel, 2010)¹⁵⁰. Finally, through the ‘concrete’ photographic representation of the ‘abstract’ (Cele, 2006)¹⁵¹ within a specific ‘time’ of a project, it's important to acknowledge that any learning outcomes exist within the context of how one looks as time; i.e. a ‘temporal lens’. The relationship between temporal lenses and stakeholder participation is increasingly discussed in research in recent years (e.g. Halskov and Hansen, 2015; Karasti, 2014; Dalsgaard and Eriksson, 2013)¹⁵², and its relevance to other disciplinary fields. These fields include organisational studies (Dawson, 2014; Ancona *et al.*, 2001)¹⁵³, ethnographic studies and anthropology (Dalsgaard and Nielsen, 2013)¹⁵⁴, and interaction design (Lundgren, 2013; Basballe and Halskov, 2012; Huang and Stolterman, 2011; Hallnäs and Redström, 2001)¹⁵⁵. However, a comparatively small amount of literature exists for the relevance of temporal lenses in architectural research, especially beyond conventional understandings of POE.

Following special issue review of participatory design literature, Saad-Sulonen *et al.* (2018)¹⁵⁶ offer five temporal lenses to enable formal understanding of perceiving stakeholder participation across time: *the phasic, momentary, retrospective, prospective and long-term lenses*. While each temporal lens carries their own relevance (e.g. as in the co-design guide as the third resource and output), certain temporal lenses echo both traditional, and emerging, practice relevances. For example, the phasic lens is focused on identifying, describing and reflecting upon different cycles of participation, or participatory activity, over time, as used in mainstream architecture and urban planning (Horelli, 2002)¹⁵⁷. Meanwhile, the retrospective lens is based on understanding and interpreting how participation changes after a project has ended, or surpassed a certain period of time e.g. Yndigejn 2016; Balka 2006)¹⁵⁸. By retrospectively assessing participation in one or many projects, this lens can be combined with a phasic lens, or inform future projects via a long-term lens. Logically, this lens could be understood as the most related to POE, especially as it includes elements of evaluation (Bossen *et al.*, 2012; Clement and Van den Besselaar, 1993)¹⁵⁹. However, in order to truly value the POE’s purpose, and the resultant benefits that could be gained, a fundamental shift

is required away from a linearity of perspective, whereby design processes are started and finished within the scope of a singular design project (Green and Moss, 1998, Zimmerman and Martin, 2001, Leaman and Bordass, 2005, Roberts, 2001; cited in Hadjri & Crozier, 2009)¹⁶⁰. This shift posits that a circularity is needed within the design process, across projects, and across disciplines, contrary to the current construction industry's norm. Notably, this same deficiency and desire for circularity and feedback loops are also called for for historic buildings and their conservation (Orbaşlı *et al.*, 2022: p.339)¹⁶¹. How POE is perceived directly facilitates this shift and adjacent relevances, from technical to non-technical, from singular project knowledge to shared disciplinary knowledge, and from singular stakeholders to more holistic approaches that can engage stakeholder groups in ways that they weren't previously.

Notably, even amongst community engaged projects, there is an existing over-emphasis of stakeholder participation, or participatory methods, located at the 'front-end' of the design process (Clever, 1999: p.597)¹⁶². However, further practice beyond this limited scope is called for (Lisius, 2012).¹⁶³ In this sense, the *prospective lens* extends beyond these boundaries — considering that stakeholder participation can be sustained or emerged in a post-project future (Simonsen and Herzum, 2008; 2012)¹⁶⁴. Whilst positioned in a future dimension, it is applied before or during a project, to lay the infrastructure for future action, artefacts and systems (Saad-Sulonen *et al.*, 2018)¹⁶⁵. This lens carries considerable opportunity in the absence of adequate understanding of historic buildings and their conservation in particular (e.g. Erder 1983; Orbaşlı and Whitbourn 2002; Santana and Settles 2014)¹⁶⁶. Lastly, the *long-term lens* stretches the view of stakeholder participation, and hence building and project engagement, by looking “*back, forward and to the present, taking into account both the past and the future, in the present*” (Saad-Sulonen *et al.*, 2018)¹⁶⁷. This view frames participation as not strictly phasic or emergent, but processual, whereby otherwise-established boundaries are blurred between “*design, use, implementation, maintenance, redesign, and repair*” (Karasti and Baker, 2008; Pipek and Wulf, 2009; Ribes and Finholt, 2009)¹⁶⁸. Able to combine with other temporal lenses, this lens opens up a space for a plurality of methods and ways of engaging stakeholders across a project — also consistent with the holistic approach to cultural heritage, buildings, and awareness of their social and economic context already called for (Russell and Leverton, 2013; Orbaşlı *et al.*, 2022)¹⁶⁹.

6 BROADENING HORIZONS : FINAL NOTES

This document has evaluated select dimensions of formalised POE practice, and articulated key relevances that locate user-centred and multi stakeholder engagement as key matters of concern within such emerging contexts. Through engaging co-designed approaches to projects, both intended and unintended patterns of use can be commonly identified, assessed and reflected upon through more comprehensive, holistic and shared feedback loops for future practice. In line with new trajectories for practice and its research that can enable practitioners, community members/users, researchers and facilitating stakeholders to work within complexity, more holistic and interdisciplinary approaches to contextual POE praxis are called for. By doing so, POE can carry significant opportunity to push boundaries of how we come to understand this understanding in the first place, advance current research applications of built interventions' evolution across time, and consequently offer considerable utility for proactive practice in (retrofit) project praxis. By drawing upon the first and second (*this document*) deliverables, the third and final resource proceeds with identifying co-design praxis pathways in Net Zero Energy (NZE) Historic Buildings towards informing future projects.

7 APPENDIX : RELATED PRACTICE EVALUATION ACRONYMS

TABLE A : PRACTICE EVALUATION ACRONYMS IDENTIFIED FOR FURTHER READING

Acronym	Title	Source
AEDET	Achieving Excellence Design Evaluation Toolkit	Ruddock, S., & Aouad, G. (2009). <i>Creating Impact in Health-Care Design: Assessment Through Design Evaluation</i> .
BASE	Building Assessment Survey Evaluation	Warner, Paul & Geoffrey Reid Associates. (2001). <i>Design of Buildings: Matching Design Assumptions and Conditions in Use</i> . CRISP Consultancy Commission 00/04.
BOSSA	Building Occupants Survey System Australia	Candido, C., Kim, J., de Dear, R., & Thomas, L. (2016). BOSSA: A Multidimensional Post-Occupancy Evaluation Tool. In: <i>Building Research & Information</i> , 44, pp.214–228
BPE	Building Performance Evaluation	Royal Institute of British Architects (RIBA) and Hay, R., S. Bradbury, D. Dixon, K. Martindale, F. Samuel, A.Tait (2016). <i>Building Knowledge: Pathways to Post Occupancy Evaluation</i> . Value of Architects, University of Reading, RIBA.
BREEAM	Building Research Establishment Environmental Assessment Method	Sharifi, A. & Murayama, A. (2014). Viability of Using Global Standards for Neighbourhood Sustainability Assessment: Insights from a Comparative Case Study. In: <i>Journal of Environmental Planning and Management</i> , Vol. 58(1): 1–23.
BUS	Building Use Studies	Szigeti, Françoise & Gerald Davis. (2002). The Turning Point for Linking Briefing and POE. In: <i>Building Research and Information</i> 30(1): 47–53.
DQI	Design Quality Indicator	Gann, D., & Whyte, J. (2003). Design Quality, Its Measurement and Management in the Built Environment. In: <i>Building Research & Information</i> , 31, pp.314–317.
EARM	Energy Assessment and Reporting Methodology	Warner, Paul & Geoffrey Reid Associates. (2001). <i>Design of Buildings: Matching Design Assumptions and Conditions in Use</i> . CRISP Consultancy Commission 00/04.
FPE	Functional Performance Evaluation	Renner, Kate. (2017). From Target to Test (Did We Get It Right?): The Functional Performance Evaluation. In: <i>LINK</i> , a publication of HKS.
LEAF	Learning from Evaluation and Applying Systematic Feedback	Akman, Elçin (2002). <i>Post Occupancy Evaluation With Building Values Approach</i> . [Masters Dissertation], Bilkent University, Ankara, Turkey.
LEO	Low Energy Office	Warner, Paul & Geoffrey Reid Associates. (2001). <i>Design of Buildings: Matching Design Assumptions and Conditions in Use</i> . CRISP Consultancy Commission 00/04.
POE	Post Occupancy Evaluation	Royal Institute of British Architects (RIBA) and Hay, R., S. Bradbury, D. Dixon, K. Martindale, F. Samuel, A.Tait (2016). <i>Building Knowledge: Pathways to Post Occupancy Evaluation</i> . Value of Architects, University of Reading, RIBA; Brown, Todd Levon (2018). A Critical Assessment of the Place of Post-Occupancy Evaluation in the Critique and Creation of Socially Responsible Architecture. In: <i>Intelligent Buildings International</i> , 10(3): 182–193
PROBE	Post-Occupancy Review of Buildings and their Engineering	Cooper, Ian (2001). Post-Occupancy Evaluation – Where Are You? In: <i>Building Research and Information</i> , 29(2): pp.158–163; Cohen, R., Standeven, M., Bordass, B., & Leaman, A. (2001). Assessing Building Performance in Use 1: The Probe Process. In: <i>Building Research & Information</i> , 29, pp.85–102.
SIA	Social Impact Assessment	Becker, H.A. (1997). <i>Social Impact Assessment-Method and Experience in Europe, North America and the Developing World</i> . UCL Press.
SPE	Social Performance Evaluation	Anderson, Margaret L. & Patricia Hill Collins. (eds.) (1997). <i>Race, Class and Gender: An Anthology</i> . 3rd ed. Boston, MA, USA: Wadsworth Publish Company (Cengage).
SROI	Social Return on Investment	Nicholls, J., Lawlor, E., Neitzert E., & Goodspeed, T. (2012). A guide to Social Return on Investment. SROI Network. Retrieved from: < http://www.socialvaluelab.org.uk/wp-content/uploads/2016/09/SROI-a-guide-to-social-return-on-investment.pdf >.
UDE	Universal Design Evaluation	Preiser, W.F.E. (2002). Toward Universal Design Evaluation. <i>17th Conference International Association for People-Environment Studies; Culture, Quality of Life and Globalization: Problems and Challenges for the New Millennium</i> . Corunna, Spain.

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