Questionnaire Evolution as a Mirror and Device of Interaction in Socio-Technical Workshops

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Abstract. The paper examines how questionnaires evolved across a series of socio-technical decision workshops supported by Problem Structuring Methods (PSMs) and the MuVAM software. Rather than treating questionnaires as neutral tools for measuring workshop outcomes, the study analyses them as evaluative artefacts that both reflect and shape interaction. Questionnaires are considered part of the intervention architecture because they define relevant dimensions of experience, organise reflection, and influence how participants reconstruct the workshop. The research investigated twelve workshops' questionnaires, in different technological conditions, including sessions involving generative AI. The findings show that questionnaires changed in response to shifts in the workshops themselves: from reflective and value-oriented reports to short surveys focused on group dynamics, and later to more structured instruments addressing AI-supported interaction. Accordingly, the study contributes to the PSMs literature by showing that questionnaire evolution can be used as empirical material for analysing changing interaction regimes in socio-technical workshops, pointing to a form of evaluative performativity in how workshops are assessed.

Keywords: Problem Structuring Methods · questionnaires · socio-technical workshops · evaluative performativity

1 Introduction

Problem Structuring Methods (PSMs) were developed for situations in which neither the problem nor the relevant criteria are fully given in advance, and where action depends on the capacity of stakeholders to articulate concerns, negotiate meanings, and progressively stabilise a workable framing of the situation [1, 2]. In this tradition, facilitated workshops are not impartial venues in which pre-existing preferences are revealed. They are socio-technical settings in which participants, models, facilitation practices, and representational devices jointly shape what the issue is understood to be and how it can be acted upon [3].

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From this perspective, evaluation is not a secondary matter. If PSMs' interventions are organised around interaction, then what counts as evidence of their effects depends on how interaction is rendered visible. Much of the literature has assessed interventions through workshop outcomes such as common understanding, commitment, or actionable options, often using interviews, observations, reflective discussions, and questionnaires [4]. Yet questionnaires have seldom been treated as an analytical object in their own right. More commonly, they appear as neutral instruments for registering workshop effects. This is problematic because questionnaires actively shape how workshop experience is articulated and reconstructed. Therefore, rather than treating questionnaires as neutral instruments, this paper conceptualises them as evaluative artefacts that define relevant dimensions of experience and shape how participants reconstruct the workshop.

Recent research makes this issue more pressing. Studies comparing PSMs-supported and non-PSMs workshops have highlighted both the importance and the difficulty of evaluating the usefulness of interventions and of linking process, outcomes, and context in a systematic way [5]. Other work has moved closer to the micro-dynamics of workshops, showing that soft OR interventions matter not only because they produce models, but because they shape how participants negotiate perspectives and values in real time, create knowledge, and agree on solutions [6]. A further extension has shown that representational and aesthetic features of workshop artefacts contribute to knowledge construction, group negotiation, and the formation of a collective orientation to action [7]. Taken together, these studies suggest that workshop artefacts are part of the interactional machinery through which problem structuring unfolds.

This issue becomes even more salient in contemporary socio-technical workshops. Recent work has shown that decision processes increasingly unfold through hybrid arrangements in which digital artefacts, software environments, analytics, and visual supports mediate how stakeholders compare options, stabilise judgements, and negotiate disagreement [8, 9]. In such settings, it is no longer sufficient to ask whether an intervention produced a useful outcome. It becomes necessary to examine how the devices mobilised within the intervention configure interaction itself. A questionnaire is one such device: its design helps organise how the workshop is later understood.

This paper takes questionnaire evolution as an analytical entry point into changing group interaction across a series of socio-technical decision workshops. Rather than focusing primarily on participants' answers, it examines the successive redesigns of the questionnaires themselves: what they ask, when they are administered, how they classify experience, and what forms of interaction they presuppose. Accordingly, the paper does not aim to provide a full case-by-case analysis of workshops, nor a detailed coding of participants' responses and workshop effects, which are addressed in [10]. Instead, it complements that work by examining the questionnaire itself as an evolving object of analysis, focusing on how its redesign progressively reframed participation, classification, and interaction across the workshop series.

Across the workshop series, the questionnaires move from broad reflective prompts oriented to values and overall process appraisal, to shorter *in-situ* surveys focused on involvement and group dynamics, and then to more structured instruments that explicitly track conflict, process phases, and the role of digital and AI-mediated support. These

shifts indicate that questionnaire evolution reflects changing assumptions about what counts as relevant interaction.

The following research question guides the paper: How does questionnaire evolution mirror and configure changing group interaction in socio-technical decision-making workshops? Framed in this way, the contribution is twofold. Substantively, the paper adds to current work on the socio-technical character of PSMs interventions by bringing the evaluative apparatus into view. Methodologically, questionnaire evolution is proposed as empirical material for studying changing interaction regimes, thereby extending calls for more process-sensitive and context-aware analyses of intervention practice.

2 Theoretical Background

The point of departure is the established view that PSMs are model-based, facilitated, participative, and iterative approaches intended to help groups deal with complexity, uncertainty, and conflict. Their distinctiveness lies not only in philosophical orientation but also in the use of transparent, visual, and requisite models that support exchange among multiple stakeholders and help them to look beneath the surface of an issue by sharing and interrogating different frames [11]. This makes interaction central. What matters is not just the model as a technical representation, but the intervention as an organised process in which representations, participants, and facilitation co-evolve. [12], therefore, argues that PSMs interventions should be studied as complex events whose efficacy cannot be grasped through traditional approaches alone. The analytical focus needs to shift towards narratives, networks, and the situated dynamics through which interventions are enacted over time.

A related line of work has emphasised the importance of understanding behaviour and socio-material mediation within PSMs interventions. [3] argue that OR interventions are exemplary settings in which people, artefacts, instruments, and practices interact, and they explicitly note the lack of strong theoretical and empirical studies capable of accounting for these interactions *in situ.* Their discussion of models as mediating artefacts is especially relevant here: models do not simply represent a problem but also help create the conditions for collective behaviour and social learning. Similarly, [13] treat facilitated modelling as a learning mechanism, and [14] recasts models as boundary objects whose cognitive affordances shape the micro-dynamics of collective interventions. This literature suggests that workshop artefacts should not be treated as passive carriers of information. They help structure attention, delimit interpretive possibilities, and support or constrain what can become a shared issue.

This argument resonates with broader socio-technical perspectives. [15] proposes that the use of PSMs can be viewed as a design science concerned not only with models and representations but also with how interventions are embedded in wider processes of action. He explicitly calls for more process knowledge about practice, especially the uncodified elements through which expertise is exercised *in situ.* [8] argue that actionable insight emerges in hybrid arrangements where human judgement, expertise, and data-driven systems are entangled rather than separable. [10], in turn, show that decision-support software creates affordances for shared visualisation, traceability, staged transitions, consensus building, and dissent management in workshop practice.

Together, these contributions reinforce the idea that socio-technical decision support is not reducible to a tool set; it is an interactional accomplishment produced through the alignment of people, representations, and digital artefacts.

For the present study, the most useful extension of this perspective comes from recent work on visual artefacts and performativity. Visual artefacts should be understood as active and performative agents in decision-making processes, capable of guiding negotiation, coordinating actors, and resolving conflicts at key moments. In linking Actor-Network Theory and PSMs, artefacts can be approached as boundary objects that do not merely document decisions but help produce them [9].

This is directly relevant to questionnaires. Although more modest than design drawings or shared digital models, questionnaires are also artefacts that intervene in decision processes. They define categories, prescribe moments of reflection, and shape how participants retrospectively reconstruct what happened. From this standpoint, a questionnaire is both a mirror and a device: a mirror because its evolution reveals what facilitators and researchers increasingly regard as salient in workshop interaction; a device because it helps configure that salience by selecting dimensions, scales, and terms through which interaction is rendered reportable.

This framing also addresses a longstanding problem in the evaluation of PSMs. The assessment of participative and systemic problem structuring methods is complicated by the fact that methods are always used in context, and that what counts as success depends on purposes, values, and local conditions [4]. If evaluations are themselves context-dependent and method-mediated, then their instruments should be examined as part of the intervention ecology rather than as neutral add-ons. The present paper therefore positions questionnaire evolution as empirical material for studying changing interaction regimes. While the paper is grounded in PSMs and socio-technical perspectives, the argument also resonates with broader work in evaluation theory that treats measurement instruments as constitutive rather than neutral. In particular, research on the performativity of metrics and evaluation devices has shown that indicators, categories, and measurement frameworks do not simply capture underlying phenomena but actively shape them by defining what is visible, comparable, and actionable [16, 17]. From this perspective, evaluation involves processes of commensuration through which heterogeneous experiences are translated into standardised forms, thereby reorganising attention, judgement, and action. Applied to PSMs workshops, questionnaires can be understood as commensurative devices that transform situated interaction into reportable categories, while simultaneously structuring how participants interpret their own experience. This extends existing accounts of evaluation in PSMs, which have tended to focus on outcomes and perceived usefulness [4], by showing that evaluative instruments participate directly in the production of the phenomena they are intended to assess. In doing so, it extends existing socio-technical and performative accounts of PSMs' practice to an evaluative artefact that has often remained in the background.

3 Research Design and Data Collection

3.1 Research Design

The study adopts a qualitative, longitudinal, comparative design in which the primary unit of analysis is the questionnaire as an evolving evaluative artefact. Rather than analysing only the substantive content of participants' responses, the study examines how questionnaire formats, prompts, scales, and timings change across successive workshops, and how these changes correspond to shifting workshop configurations and shifting assumptions about what counts as relevant interaction.

In this respect, the design is close in spirit to the participant-centred logic adopted by [10], while addressing a different empirical object. Whereas their analysis focuses on the affordances of decision-support software as perceived by workshop participants, including the qualitative coding of participants' responses and the evolution of observable group dynamics related to the changing decision-support setting, the present study focuses on the evaluative devices attached to those workshops. It therefore does not seek to replicate their case-by-case analysis of workshop outcomes or participant-level effects. Instead, it asks how the evolution of reports and surveys mirrors and configures the changing socio-technical ecology of facilitated decision-making.

The comparative logic is essential. Looking across multiple workshop settings makes it possible to distinguish one-off adaptations from more systematic shifts in the observational regime. The longitudinal logic is equally important, since it allows the reconstruction of a trajectory from delayed reflective reporting to immediate short-form surveying, to AI-oriented questionnaires, and finally to structured pre/post designs. The analytical aim is therefore not to identify a single best instrument, but to understand how different instruments enact different ways of seeing the workshop.

The corpus comprises twelve workshops (Table 1) conducted over several iterations of a decision support software-based teaching and research activity in France, Italy, Slovakia, Albania, spanning Bachelor's, Master's, PhD, and executive-learning settings. Specifically, the workshops were carried out using MuVAM, designed to tackle complex issues through collaborative discussion, the joint development of solutions, and deliberation within a user-friendly interface [10, 18]. The corpus deliberately combines in-place, remote, and hybrid sessions, as well as workshops without AI (WS/01–WS/08) and workshops in which generative AI was explicitly introduced as part of the socio-technical setting (WS/09–WS/14). This diversity is analytically useful because it makes it possible to compare not only different participant cohorts, but also different evaluative needs generated by different intervention formats.

Table 1. Research setting and workshop corpus.

ID	Institution	Programme	Participants	Mode	AI	Output
WS/01	Université Gustave Eiffel, Paris (FR)	Master 2, Sustainable Urban Development	15	In-place	No	Report

(*continued*)

Table 1. (*continued*)

ID	Institution	Programme	Participants	Mode	AI	Output
WS/02	Politecnico di Torino (IT)	Ph.D. Urban and Regional Development	13	In-place + remote	No	Report
WS/03	Politecnico di Torino (IT)	2nd Level Master's Degree in Governance of Resilient Territories	13	Remote	No	Survey
WS/04	Slovak University of Technology, Bratislava (SK)	Erasmus + Project "Blended Intensive Programme", Bachelor's degree	30	In-place + remote	No	Survey
WS/05	Polis University, Tirana (AL)	Horizon Europe Project "GreenFORCE", Bachelor's degree	9	In-place	No	Survey
WS/06	International Training Centre of the ILO, Turin (IT)	Master's Degree in Technology and Public Policy	15	In-place	No	Survey
WS/07	Université Gustave Eiffel, Paris (FR)	Master 2, Sustainable Urban Development	13	In-place	No	Report
WS/08	Politecnico di Torino (IT)	Ph.D. Urban and Regional Development	9	In-place	No	Report
WS/09	Politecnico di Torino (IT)	Master's Degree in Architecture, Construction and City	42	In-place	Yes	Report
WS/10	UGE 2024	Master 2, Sustainable Urban Development	18	In-place	Yes	Report
WS/11	Politecnico di Torino (IT)	Ph.D. Urban and Regional Development	11	In-place	Yes	Report + Survey
WS/12	UGE 2025	Master 2, Sustainable Urban Development	14	In-place	Yes	Report

(*continued*)

Table 1. (*continued*)

ID	Institution	Programme	Participants	Mode	AI	Output
WS/13	University of Parma (IT)	Master's Degree in Architecture for Sustainable Cities	32	In-place	Yes	Survey
WS/14	University of Parma (IT)	Master's Degree in Architecture for Sustainable Cities	59	In-place	Yes	Survey

3.2 Data Collection

Data collection followed an iteratively layered logic and combined delayed reports with immediate surveys. The heart of the dataset is the questionnaire material itself. Rather than privileging just one instrument type, the study reconstructs how different questionnaire forms were attached to different workshop settings and how their prompts evolved as the observed phenomenon changed.

For WS/01–WS/08, data collection relied on two main formats. In workshops where participants had the time to revisit the session after the event, teams were asked to prepare a structured feedback report within approximately three to four weeks. The report template evolved iteratively over time yet retained three almost invariant areas: group dynamics and collective interaction, values guiding collective and individual choices, and collective understanding of the problem. Across successive versions, questions were added, refined, or removed, but the report remained the preferred instrument whenever the aim was to elicit reflective, comparatively rich, and contextually grounded accounts of the workshop process.

Where course schedules or workshop formats did not allow for delayed written reflection, a short survey was administered immediately at the end of the session. These surveys mirrored the core areas of the reports while capturing an in-situ snapshot of the experience. In line with the rationale adopted by [10], the short survey was not treated as a substitute for the report in terms of depth, but as a complementary instrument capable of preserving immediacy, especially on questions related to collective understanding, felt involvement and group dynamics.

A second wave of data collection emerged with the AI-oriented workshops. For WS/09-WS/13, the report architecture was reworked to make the AI contribution directly observable. The prompts asked participants to reflect on the contribution of AI across the different phases of MuVAM, on its influence on group dynamics (including consensus building, dissent management, and the speeding up or slowing down of specific steps) and on the extent to which outcomes corresponded to their own position. In the AI-supported conditions, participants were also asked to document the actual interaction with AI by providing the full sequence of prompts and responses, supported by screenshots. In the workshop without AI, the questionnaire was adapted counterfactually and asked respondents to imagine what AI might have contributed. This redesign is

methodologically significant because it shows that once AI becomes part of the workshop ecology, evaluation can no longer focus only on generic workshop effects; it must explicitly capture hybrid agency and phase-specific mediation.

A third wave is represented by WS/14, where the questionnaire design became more explicitly structured and closer to a pre/post logic. The corpus includes an English pre-survey/post-survey pair. These instruments move beyond broad reflective prompts and decompose the experience into prior familiarity with AI, expectations about its role in decision-making, phase-specific uses during the workshop, types of tasks delegated to AI, and perceived effects on speed, option clarification, trade-off clarification, participation, and control. This phase is especially important for the argument of the paper because it makes clear that questionnaires do not merely follow workshop change; they actively configure what counts as evidence of that change.

Taken together, the dataset is not a single questionnaire administered repeatedly, but a corpus of evolving evaluative devices (Table 2). The analytical value of this corpus lies precisely in the coexistence of stable cores and progressive redesign. The reports preserve a reflective narrative mode. The short surveys preserve immediacy and comparability. The AI-specific instruments add phase-sensitive and socio-technical dimensions. The later pre/post surveys introduce baseline expectations and perceived change. This combination makes it possible to analyse questionnaire evolution not as noise in the dataset, but as part of the phenomenon under study.

Table 2. Data collection waves and dominant questionnaire logic.

Workshop	Main instrument	Dominant evaluative focus	Analytical role
WS/01–WS/02, WS/07–WS/08	Structured feedback reports	Reflective assessment of group dynamics, values, and outcomes	Primary source for delayed, interpretive, and comparatively rich accounts
WS/03–WS/06	Immediate end-of-workshop Google surveys	Collective understanding, involvement, group dynamics, workshop rhythm	*In-situ* complement to the reports; captures immediacy and supports triangulation
WS/09–WS/13	AI-oriented reports and report + survey combination	AI contribution by phase, influence on group dynamics, outcome evaluation, interaction traces	Transitional source showing the shift from human-only to hybrid workshop evaluation
WS/14	Structured AI surveys, including pre/post design	Prior familiarity, expectations, phase-specific AI use, perceived effects on decision-making	Most explicit evidence of questionnaire redesign as a device for observing hybrid interaction

Two brief illustrations help clarify why the questionnaire should be understood here as a practical tool rather than as a neutral recording device. In WS/01, conducted with Master's students in Sustainable Urban Development at Université Gustave Eiffel in Paris, the post-workshop report explicitly asked participants to reflect on the influence of the methodology and software on collective interaction. This prompt elicited a concrete reconstruction of how the shaping and designing phases redistributed voice around the urban-transformation issues under discussion. As reported in the companion analysis by [10], participants noted that "the group's words were much more important than individual words" and that the shared workspace helped ensure that no one was left out of the discussion. In this case, the questionnaire did not merely collect a general judgement of satisfaction: it made visible how the procedure supported compromise formation, equal participation, and the legitimisation of the collectively endorsed problem focus.

A different function emerges in WS/02, held with Ph.D. participants at Politecnico di Torino. Here the questionnaire architecture linked the collective phases more explicitly to the subsequent individual comparison and analysis stages. The answers therefore made it possible to identify the point at which deliberation was translated into a ranked choice. In the related workshop evidence discussed by [10], the analysis phase was described as the moment that allowed participants to "integrate each member's opinion in a standard and systematic way" and to compare individual responses with the final group result; another respondent observed that the methodology led the group "in a direction that we wouldn't necessarily have taken intuitively". The questionnaire thus operated diagnostically: it did not simply register whether agreement had emerged, but clarified where, and through which interactional mechanism, the final decision became collectively stabilised.

4 Findings

The first finding is that the questionnaires do not evolve according to a simple logic of progressive refinement (Fig. 1). They are repeatedly re-specified because the object to be observed changes. In the earliest instruments, the principal concern is to reconstruct how participants experienced the workshop as a whole. The questionnaire functions primarily as a reflective device: it asks respondents to narrate how the methodology affected collective work, which values guided the choices made during the process, and whether the outcome corresponds to their own view of the case. At this stage, the instrument is oriented less toward isolating variables than toward eliciting a second-order account of the intervention.

That orientation changes in the later instruments. Once the workshops begin to incorporate a more explicit concern with group process, and later with AI-supported decision making, the questionnaire no longer asks only what participants thought of the workshop overall. It asks, instead, how understanding was produced, whether people felt involved, how phases affected rhythm, whether all participants were able to contribute, and eventually how AI entered specific stages of the process. The underlying shift is therefore from a holistic reconstruction of the workshop toward a more selective observation of interactional properties.

In this sense, questionnaire evolution mirrors a deeper transformation in the intervention setting. The observed object moves from collective sensemaking around values and

alternatives, to immediate experience of participation and rhythm, then to complexity and conflict management, and finally to hybrid human-AI interaction. The questionnaires change because the workshop changes.

According to this logic, in Fig. 1, each question and related topic is assigned a colour, which is retained even when the wording changes slightly. When a question remains essentially the same, it is connected to the next node by a solid line. When the question changes but stays within the same theme, informing the following one, it is connected by a dashed line, with the thematic addition and/or modification explained in words. The same logic also applies across reports and surveys, showing a process of progressive evolution.

4.1 A Reflective and Value-Oriented Regime

The earliest regime may be described as reflective and value-oriented. In the first report-based instruments, the questionnaire is designed to elicit interpretation rather than measurement. Respondents are asked to reflect on how the different stages of the methodology influenced group dynamics, which values guided the collective and individual phases, and whether the results appear satisfactory. Such prompts assume that the relevant evidence lies in participants' retrospective interpretation of the experience, not yet in the measurement of discrete process variables.

Two implications follow. First, the workshop is primarily observed as an exercise in collective sensemaking. What matters is whether the process helps participants articulate and organise values in relation to a problematic situation. Second, the instrument leaves substantial interpretive space to respondents. It does not impose a strong vocabulary of standardised constructs. Participants are not yet asked to rate agreement, influence, or participation on a scale; they are asked to narrate how the process unfolded and how they situate themselves in relation to its outcomes.

The questionnaire therefore acts less as an external measuring tool than as an extension of the intervention itself. It prolongs the reflective work of the workshop by inviting participants to stabilise, after the event, a particular version of what the collective exercise was about. In this early regime, the questionnaire is already active, but its action is documentary and interpretive rather than decompositional.

4.2 A Short, Immediate, and Interaction-Focused Regime

A second regime emerges when the longer reports are replaced, in several workshops, by very short surveys administered at the end of the session. This transition is consequential because it alters both the temporal position and the analytical grain of the instrument. The questionnaire now seeks to capture immediate experience rather than retrospective interpretation. Its recurring concerns are no longer primarily values and post-hoc evaluation, but collective understanding, involvement, group dynamics, and rhythm.

This shortening is not merely a practical concession to workshop and teaching constraints. It also changes what becomes visible. By privileging questions that can be answered quickly at the end of the session, the instrument foregrounds aspects of interaction that are felt in the moment: whether participants understood the problem better, whether they felt involved, and how the phases affected the pace and quality of the

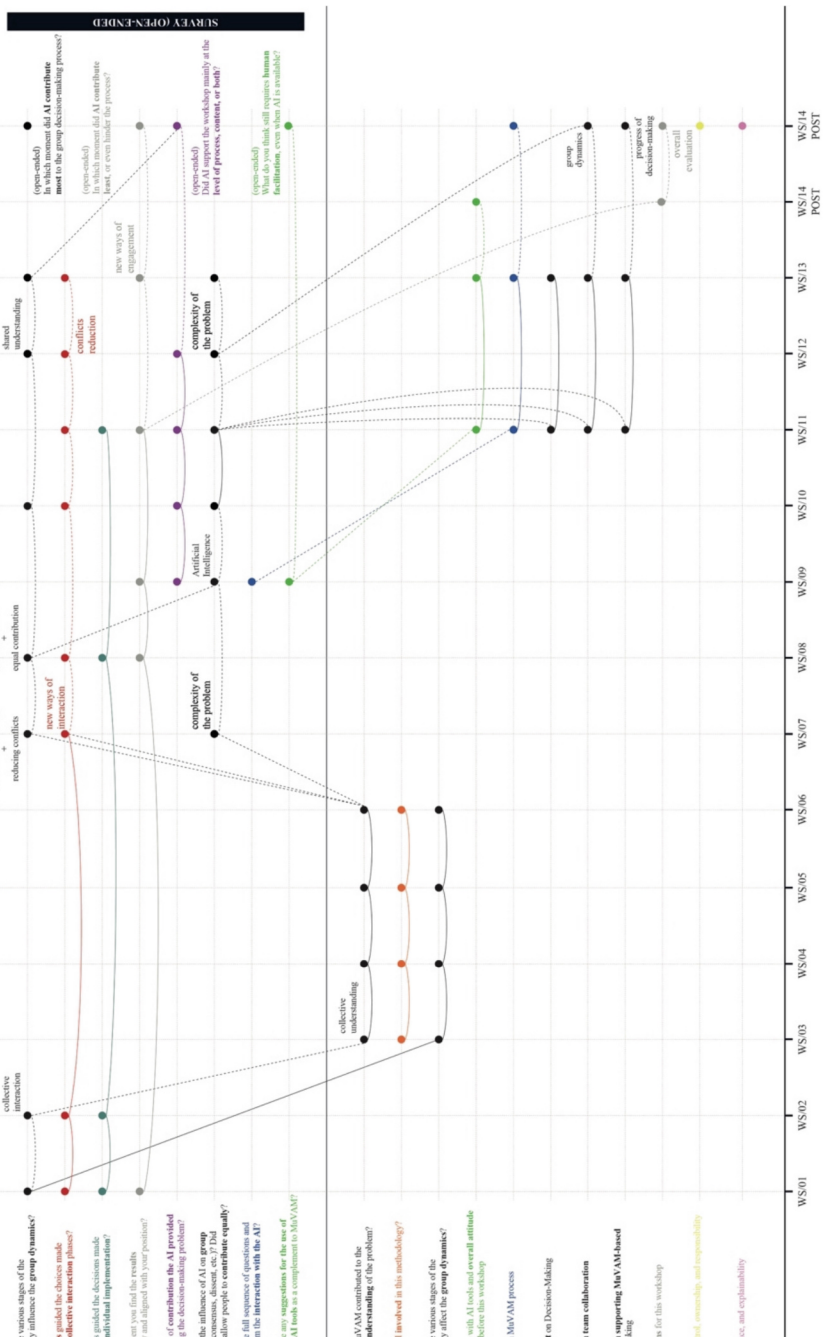

Fig. 1. The evolving structure of the questionnaires.

collective process. The workshop is thus re-specified as an interactional setting whose inclusiveness and temporal rhythm become salient objects of observation. The questionnaire, at this point, begins to produce a taxonomy of categories for group process. Understanding, involvement, and rhythm are not neutral descriptors; they are categories through which respondents are prompted to re-read what just happened. The instrument is therefore already doing more than recording impressions. It is helping to define which dimensions of experience count as relevant.

4.3 From Generic Group Dynamics to Complexity and Conflict in Participation

A further finding is that the questionnaire does not simply become shorter or more structured; it also becomes more selective about which dimensions of interaction deserve explicit attention. In the transitional instruments, generic references to group dynamics begin to give way to sharper concerns with perceived complexity, conflict reduction, equality of contribution, and new modes of engagement in problem solving. This is an important analytical shift because it indicates that the workshop is no longer being observed only as a setting in which participants share values or impressions. It is being observed as a process that may redistribute voice, alter perceptions of problem complexity, and transform the way disagreement is handled.

The introduction of conflict and complexity is especially significant. Earlier instruments tend to imply that the goal of the process is collective clarification and movement toward a satisfactory outcome. The later formulations recognise, more explicitly, that disagreement and uncertainty are constitutive dimensions of these workshops. Conflict becomes something to be managed, reduced, or made productive; complexity becomes something whose perception may itself be transformed through collective work and visualisation. Participation, similarly, is no longer treated only as a feeling of involvement but as a question of whether contributions were distributed more equally across the group.

The consequence is that the questionnaire begins to act as a finer-grained analytical device. It no longer asks simply whether the process was useful; it asks how the process reorganised cognition, disagreement, and voice. This marks a decisive step away from general workshop appraisal toward the observation of interactional mechanisms.

4.4 Explicit Comparison and Hybrid Agency Tracking with AI

The most substantial transformation in the corpus occurs when AI enters the workshop design. At this point, the questionnaire is reorganised around a different problem: not only how the group interacted, but how interaction was reconfigured once an additional sociotechnical actor entered the process. The AI-related instruments ask about the contribution of AI across different stages of the methodology, its influence on group dynamics, the quality of the outputs produced, and the way participants interacted with software, prompts, and externally generated responses. A concrete example can be seen in WS/11, where the Google survey begins by asking respondents to state their group, disciplinary background and nationality, previous experience with AI tools (from no prior experience to expert level), and their initial attitude towards AI in decision-making (from skeptical to highly positive). This design choice does not merely collect descriptive information:

it establishes a baseline of familiarity and trust against which the later use of AI in MuVAM can be interpreted, making hybrid agency empirically observable rather than only theoretically asserted.

This is a major change in the implied ontology of the workshop. Earlier questionnaires treated the intervention largely as human interaction mediated by a methodology and a facilitation environment. The AI-specific questionnaires treat the workshop as a hybrid assemblage in which agency is distributed across people, prompts, interfaces, generated responses, and procedural sequences. The instrument therefore has to change because the phenomenon being observed has changed. Questions about AI contribution, centrality, support, influence, and control are not add-ons to the earlier framework; they indicate that the group process is now being understood as a different configuration of action.

The request, in some cases, to document the exchange with AI through prompts, answers, and screenshots further reinforces this transformation. The questionnaire becomes partly archival. It no longer collects only perceptions of the workshop; it gathers traces of the interactional chain through which the workshop unfolded, particularly through pre/post evaluation in WS/14. In methodological terms, this is a significant move from reflective reporting to process tracing within a socio-technical setting.

4.5 A Variable-Based Decomposition of the Process with AI

Another finding is that the AI-related phase brings with it a stronger decomposition of the workshop into phases, functions, and variables. Earlier instruments asked respondents to reflect on the process as a whole or on broad workshop phases. The later pre/post and post-workshop questionnaires break the process down more systematically: prior familiarity with AI, prior expectations, phase-specific use of AI, types of requests addressed to AI, perceived usefulness, degree of influence on the final decision, and agreement with statements about speed, clarification of options, clarification of trade-offs, and related process effects. The WS/11 Google survey is especially indicative in this respect: by separating prior AI experience from prior normative attitudes towards AI, it already decomposes the socio-technical setting into distinct variables before the workshop begins. In practical terms, this makes it possible to read subsequent differences in reported speed, clarification, or influence not as generic reactions to AI, but as effects filtered through different initial positions of competence, confidence, and critical distance.

This decomposition does not merely increase analytical precision. It changes the mode of observability. The questionnaire is no longer satisfied with asking whether the workshop was useful or whether AI mattered. It defines, in advance, a set of dimensions through which AI's role is to be recognised and judged. This is especially evident in the pre/post architecture of WS/14, which establishes a baseline before the workshop and then channels post-workshop reflection through a structured grammar of hybrid decision making. The instrument thus pre-configures what will count as evidence of change.

Seen in this light, the questionnaire does not stand outside the intervention. It participates in the production of a particular reflective order. Respondents are encouraged to think in terms of centrality, contribution, speed, trade-offs, and human control because the instrument has already declared these to be relevant categories. The questionnaire

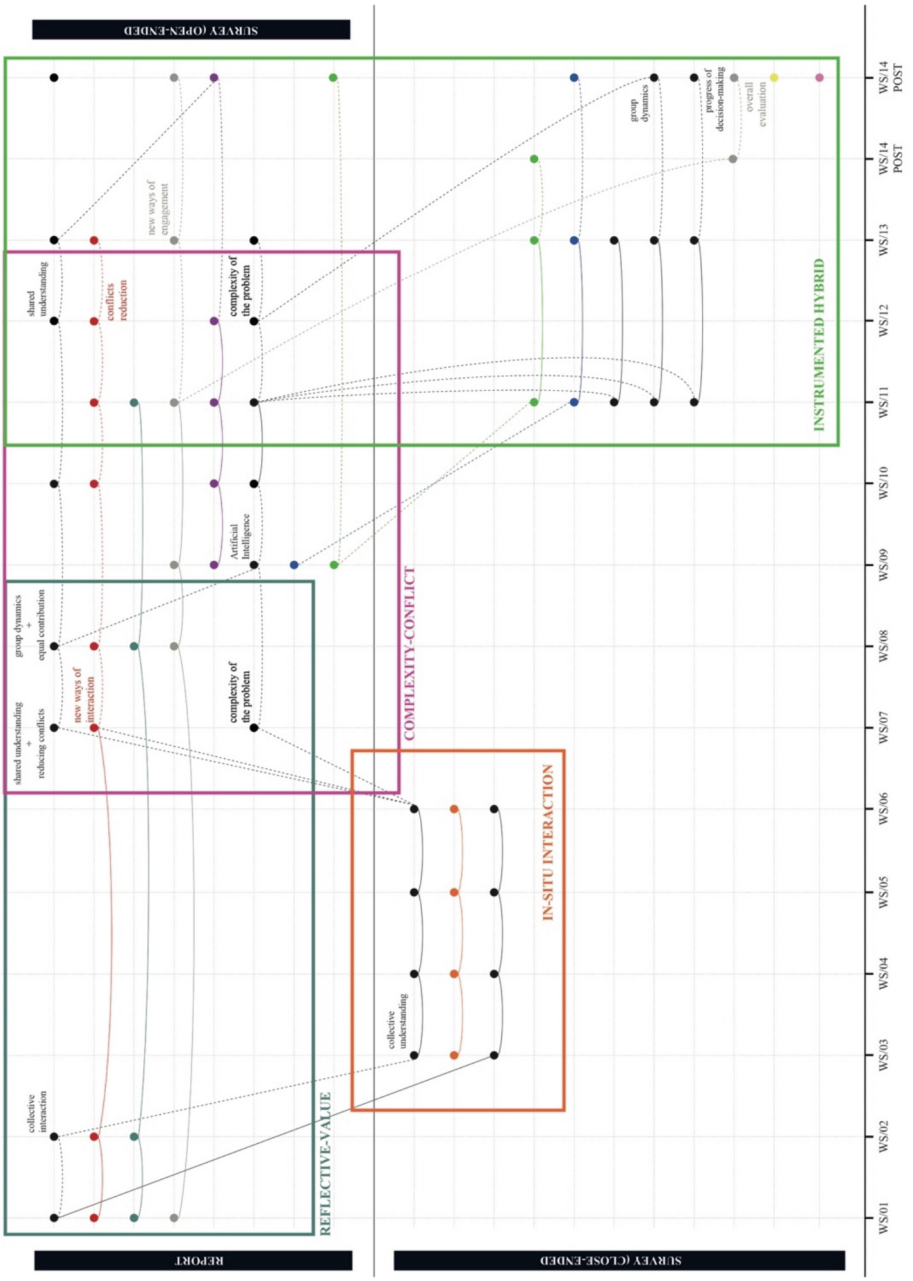

Fig. 2. Four regimes of observation in questionnaire evolution.

therefore acts not only as a mirror of interaction but also as a device that helps make that interaction legible in a specific way.

4.6 Evaluative Performativity

Across the questionnaire corpus, four overlapping regimes of observation can be identified (Fig. 2). The first is a reflective-value regime, centred on participants' values, collective and individual choice, and overall outcomes. The second is an *in-situ* interaction regime, focused on immediate perceptions of understanding, involvement, and group dynamics. The third is a complexity-conflict regime, which foregrounds management of the disagreement, and distribution of participation. The fourth is an instrumented hybrid regime in which the role of digital tools and the contribution of AI emerge within human machine interaction. While elements of these regimes coexist, their relative emphasis shifts over time, reflecting changes in both workshop design and evaluative priorities. The analytical significance of these regimes lies in demonstrating that questionnaires evolution is not simply a matter of refinement or improved measurement. These regimes may be understood as a form of evaluative performativity.

Each regime enacts a different way of rendering interaction observable, moving from holistic, interpretive accounts towards increasingly structured and decomposed representations of process. In this sense, questionnaires do not merely track changes in workshops; they participate in redefining what counts as relevant interaction and how it can be known. The transition across regimes therefore reflects a broader shift from viewing workshops as sites of collective sensemaking to understanding them as socio-technical systems in which interaction is progressively formalised, instrumented, and, in the case of AI-supported settings, distributed across human and technological actors.

5 Conclusions

This paper shows that questionnaires in socio-technical workshops are not neutral instruments for capturing outcomes but active elements of the intervention itself. By examining their evolution across multiple workshops, the analysis demonstrates that questionnaires participate in shaping how interaction is rendered visible, structured, and interpreted. Rather than simply recording participant experience, they define categories, organise reflection, and stabilise particular accounts of what the workshop was and what it achieved. In doing so, questionnaire design becomes part of the process through which collective sensemaking, participation, and, in more recent settings, human–AI interaction is constituted and understood.

This insight matters for both theory and practice. Theoretically, it extends work in PSMs and socio-technical systems by bringing the evaluative apparatus into view as a performative component of intervention, aligning with broader perspectives in evaluation theory that treat measurement as constitutive of the phenomena it assesses. It therefore reframes evaluation not as a downstream activity but as an integral part of how interaction unfolds and is stabilised. This suggests that facilitators and researchers need to treat questionnaire design as a strategic intervention choice rather than a technical afterthought. Different questionnaires privilege different aspects of interaction, such as

values, participation, conflict, or distributed agency, and therefore shape what becomes visible, discussable, and actionable within and beyond the workshop.

An important limitation concerns the paper's strong empirical anchoring in a single decision-support environment, MuVAM, and in workshop settings that were mainly educational and comparatively low-stakes, which means that the identified patterns should be interpreted as analytically suggestive rather than automatically generalisable to other tools, facilitation designs, or higher-conflict decision arenas. Future research should extend this analysis by linking questionnaire design more directly to observed interactional dynamics and outcomes, combining the study of evaluative instruments with *in-situ* observation and response analysis. Comparative work across different PSMs traditions and decision-support settings would help clarify how alternative evaluative designs privilege different forms of knowledge and participation. In addition, the increasing integration of AI into decision processes raises new questions about how evaluation can capture distributed agency, evolving roles, and the balance between human judgement and machine support. Exploring these issues would deepen understanding of how evaluative practices co-evolve with the socio-technical systems they are intended to assess.

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