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Revisiting Cybersyn: A Participatory Framework for Information Design as Cultural Practice

Abstract

This article reactivates Project Cybersyn's interrupted legacy by reconfiguring Stafford Beer's Viable System Model as participatory infrastructure for information design practice. Through workshops with twelve Latin American diaspora participants in the UK, we demonstrate three methodological innovations: cultural citation as practice of reactivating 1970s visual materials alongside contemporary institutional documents, privileging affective and relational engagement over data extraction, and workshop-as-deliverable that reconceptualizes participatory encounters as legitimate design outputs. Counter-visualizations produced through collage and collective annotation challenge universalist conventions while remaining accountable to situated knowledge. This research positions information design as cultural practice grounded in specific trajectories, offering methodological alternatives to extractive research patterns while building infrastructures for equitable knowledge representation.

Keywords: Information design, participatory workshops, Cybersyn, diaspora communities, Viable System Model

1. Introduction

This article documents a participatory workshop methodology grounded in cybernetics, technological infrastructure, situated interfaces, and socialist participatory practice developed in Chile between 1971 and 1973. Working with twelve participants from Latin American diaspora communities in the UK (Chile, Peru, Uruguay, Colombia, Mexico), we demonstrate how Stafford Beer's Viable System Model (VSM) can be refigured from its managerial context into a framework for collective knowledge-making.

Our research makes three methodological contributions to information design. First, we introduce cultural citation as a practice of reactivating 1970s Latin American visual materials alongside contemporary institutional documents, treating historical residues as conceptual resources rather than nostalgic reference. Second, we propose energetic flows as an alternative to data flows, foregrounding transformation, affective engagement, and relational dynamics over extraction and control. Third, we position the workshop as deliverable, reconceptualizing participatory encounters as legitimate information design outputs rather than preparatory research.

These innovations, operating within the reconfigured VSM framework, position visualization practice as a political act of representation. Rather than seeking cultural adaptation within existing conventions of clarity and universality, the workshop creates conditions for communities to compose alternative visual representations - what we term counter-visualizations - that remain accountable to their own situated knowledge, cultural trajectories, and epistemological values.

Central to this work is co-author Barbara Badilla's lived connection to Chilean design history and Project Cybersyn's interrupted trajectory. Her engagement with Cybersyn is not archaeological recovery but genealogical reclamation: knowledge that belongs to Chilean experience and continues to resonate within Latin American communities navigating migration, systemic invisibility, and institutional exclusion. The workshop methodology thus represents the reactivation of cultural knowledge through design practice, remaining accountable to the communities who hold it.

1.2 Project Cybersyn as interrupted infrastructure

Project Cybersyn (1971-1973) represents a distinct Latin American contribution to systemic design grounded in socialist participation, cybernetic thinking, and recognition that interfaces are always situated and political. Developed under President Salvador Allende's government with British cybernetician Stafford Beer and key figures including Raúl Espejo (technical director) and subproject leaders Gui Bonsiepe, Roberto Cañete, and Sonia Mordojovich, the project deployed Beer's VSM to support worker participation and decentralized decision-making through real-time communication between Chilean factories and central planning. The VSM's five interconnected systems enabled recursive feedback loops that allowed worker knowledge to inform national economic decisions while maintaining local operational autonomy.

We recognize Cybersyn's methodological limitations as applied in Chile and, as Espejo (1990) outlined, while the project developed sophisticated technologies and tools, it struggled to transform the cybernetics of existing social structures (p. 312) - a challenge that informs our approach to workshops as infrastructural interventions.

While the 1973 military coup interrupted Cybersyn's trajectory, its epistemological commitments of participation over extraction, situatedness over universality, and recursive adaptation over hierarchical control remain vital resources for information design practice. Significantly, Beer himself was profoundly transformed by the Chilean collaboration; as biologist Humberto Maturana observed, Beer "came to Chile a businessman and left a hippie" (Medina, 2011, p. 224), suggesting how the project's socialist orientation fundamentally reshaped his cybernetic thinking.

1.3 Methodological Positioning

Our methodology emerges from Project Cybersyn's historical context rather than applying existing critical frameworks retrospectively. While contemporary scholarship increasingly challenges universalist assumptions in information design through critiques in HCI (Bardzell, 2012), data science (D'Ignazio & Klein, 2020), and visualization (Hall and Davila, 2022) - and while participatory design traditions have long contested designer-as-expert models (Sanders & Stappers, 2008; Björgvinsson

et al., 2012) - we reactivate suppressed knowledge from Latin American cybernetic experiments of the 1960s–70s on its own terms (Nieto Larrain et al., 2022; Medina, 2011).

Rather than arguing for participation generally, we demonstrate how Beer's VSM can be reconfigured as participatory infrastructure - methodological innovations grounded in Latin American experience. This distinction matters: we work through practice research rather than seeking validation through existing academic frameworks, while acknowledging our contribution to broader conversations about culturally responsive design.

The workshop reconceptualizes Beer's VSM architecture as infrastructure for participatory meaning-making. Where Cybersyn sought homeostatic stability through predictable feedback loops, our adaptation embraces generative friction, productive tensions emerging when different forms of knowledge encounter one another. Participants engage with curated data boards containing institutional narratives alongside archival materials from 1970s Latin American publications and, through collage and annotation, create counter-visualizations which support collective sense-making while resisting singular interpretation.

Where conventional information design positions designers as neutral translators of data into visual form, we understand design as constituting the conditions through which knowledge emerges. The workshop functions not as preparatory research but as a viable system of meaning-making whose design directly shapes what can be known, felt, and collectively articulated.

This repositioning draws on Gui Bonsiepe's understanding of interface as "dimension for interaction" (1999) rather than technical object, a theoretical framework developed within Latin American design contexts during the same moment as Cybersyn. The workshop operates as a non-technical interface: a relational and affective field where participants engage with tools, systems, and one another to compose new meanings through conversation, gesture, material selection, and negotiation. Following Beer's recognition in his later work that systems involving human actors become "endlessly reflecting and reacting to everything else" (1994,

p.33), we position the designer-researcher as embedded participant rather than external observer.

1.4 Theoretical Contributions and Article Structure

The theoretical contributions presented here were developed iteratively to articulate what occurred when information design practice is grounded in Latin American cybernetic traditions. We frame these as:

- **An ethics of the provisional:** positioning incompleteness, ambiguity, and partiality as generative design conditions rather than limitations, allowing artifacts and processes to remain open to continued negotiation.
- **A politics of reuse:** activating historical residues through cultural citation practices that treat the past not as fixed resource but as presence to be negotiated with.
- **Workshop as viable system:** demonstrating how participatory encounters can operate as recursive infrastructures that maintain capacity for collective sense-making through energetic flows rather than hierarchical control.

Section 2 establishes the theoretical framework, focusing on Cybersyn's historical context, Beer's VSM as foundation for participatory practice, and Bonsiepe's interface theory extended towards understanding workshops as relational assemblies. Section 3 details the methodology, including the five-system workshop architecture, visual methods of collage and annotation, and ethical considerations. Section 4 integrates workshop process and outputs, documenting how each VSM system translated into practice while examining the artifacts produced—from data boards through collaborative collages to analytical re-diagramming. Section 5 discusses implications for information design practice, exploring provisional approaches, situated design, and workshop infrastructures as deliverables. The conclusion positions information design as cultural practice, articulating future research directions and the broader significance of workshops as infrastructural care.

This research demonstrates how information design might operate when grounded in specific cultural trajectories, historical consciousness, and relational epistemologies.

By reactivating Cybersyn's ethos through contemporary workshop practice, we offer methodological alternatives to extractive research patterns while building infrastructures that understand participatory encounters as legitimate sites of design knowledge production.

2. Theoretical framework: conjuncture, system, interface

The article's theoretical framework draws together three interconnected strands: the conjunctural moment of "around 1972" as temporal context when political ideologies actively shaped technological design, Beer's Viable System Model reconfigured for participatory practice and Bonsiepe's interface theory extended towards workshops as relational assemblies. Rather than discrete theoretical positions, we understand these as a constellation emerging from a specific historical convergence that continues to offer resources for reimagining information design as culturally responsive, collectively authored, and ethically situated practice.

2.1 'Around 1972' as Conjunctural Moment

Tom Holert's (2024) conjunctural framing of "ca. 1972" identifies a moment when social, political, and cultural forces converged to produce experimental infrastructures that remain conceptually available for reactivation. Beyond Chile, the early 1970s is notable for intersecting activities across media, governance, education, and design that weren't unified or coordinated developments but speculative and contested impulses attempting to reimagine the infrastructures of collective life. These included Stewart Brand's Whole Earth Catalog (1968-1972) pioneering alternative information design through countercultural editorial montage (Turner, 2006); cybernetic governance projects in Berkeley and Amsterdam alongside Cybersyn; the "Hippie Modernism" movement fusing technological utopianism with communal experiments (Blauvelt, 2015); alternative media networks including underground press and video collectives; and participatory design initiatives emerging from Scandinavian social democracy. While geographically dispersed and ideologically diverse, these projects shared commitments to distributed authority, user participation, and systematic alternatives to dominant paradigms.

This temporal cluster matters not simply because Cybersyn happened then, but because, as Medina argues, "political ideologies not only articulate a worldview but can contribute to the design and application of new technologies to reconfigure state power" (2011, p.214). Project Cybersyn exemplifies this convergence. Developed under President Allende's government, it deployed Beer's VSM to support worker participation and decentralised decision-making through real-time communication flows between Chilean factories and central planning. The project's significance extends beyond its technical implementation: it demonstrated how cybernetic thinking could serve socialist participation rather than

managerial control, creating interfaces that were "always situated and political" (Medina, 2011). The 1973 military coup interrupted this trajectory, but its epistemological commitments of participation over extraction, situatedness over universality, recursive adaptation over hierarchical control remain vital resources for culturally-responsive information design practices.

We approach this historical moment not as closed chapter but as trajectory that remains present through conceptual and affective traces still available for activation. This framing allows us to understand our workshop methodology not as nostalgic recovery but as reactivation of suppressed knowledge within Latin American design traditions - a practice we term "cultural citation"- that challenged neutrality assumptions underlying dominant visualization paradigms. These commitments remain conceptually available despite their historical interruption. Our workshop methodology reactivates its trajectory not by recreating Cybersyn's specific forms but by operationalizing its core epistemological commitments within present conditions.

2.2 The Viable System Model as framework for participation

Stafford Beer's Viable System Model provides recursive organizational logic that we reconfigure from managerial control towards participatory knowledge-making. As outlined in Section 1, the VSM comprises five interconnected systems that maintain viability through feedback loops: System 1 (autonomous operational units), System 2 (coordination mechanisms), System 3 (operational management and resource allocation), System 4 (environmental scanning and strategic intelligence), and System 5 (policy coherence and identity) (Beer, 1972, 1981).

Cybersyn's implementation of Beer's VSM used this systemic logic to enable real-time communication between Chilean factories and central planning, allowing worker knowledge to inform national economic decisions while maintaining local autonomy. As Medina notes, Beer himself was left profoundly transformed by his Chilean collaboration - where he "came to Chile a businessman and left a hippie" (2011, p.224), suggesting how the project's socialist orientation fundamentally reshaped his cybernetic thinking.

Our theoretical refiguration maintains the VSM's recursive logic while transforming its political and affective orientation. Where Beer's original model sought homeostatic stability through predictable feedback loops, our adaptation embraces generative friction, the productive tensions that emerge when different forms of knowledge encounter one another

in circumstances that aren't overly-prescribed or resolved. Drawing on Mouffe's (2013) concept of agonistic pluralism, we understand disagreement and difference not as problems requiring resolution through consensus but as generative conditions for democratic knowledge-making. This positions participation itself as recursive: an iterative process where earlier contributions reshape conditions for what follows.

The workshop operates through what we term **energetic flows** rather than data flows, foregrounding transformation, emergence, and relational dynamics over extraction and control - a distinction central to our reconfiguration of the VSM (see section 4.3).

This reframing of the VSM - from managerial control towards participatory practice, from homeostatic stability to generative friction, from data flows to energetic flows- draws on second-order cybernetics' recognition that systems involving human actors cannot be observed from outside (von Foerster, 2003). As Beer was to acknowledge in his later work, everything becomes "endlessly reflecting and reacting to everything else" (Beer, 1994, p.33). Such a recursive entanglement means that all actors within a system – from participants to facilitators, materials and their histories - are mutually constitutive rather than occupying separate observer/observed positions. Within a participatory workshop, the designer-researcher becomes embedded participant rather than an external analyst, while participants themselves shape the system's evolution through their contributions. Everyone is simultaneously observing and being observed, shaping and being shaped - a recursive dynamic of mutual influence that materializes throughout our workshop methodology, where the VSM's structure enables ongoing transformation rather than hierarchical control.

2.3 Interface: from Bonsiepe to assembly

Gui Bonsiepe's 1970s work on interface as "dimension for interaction" (1999, p.29) provides the foundation for reconceptualising design practice beyond technical functionality towards relational and affective fields of meaning-making. Developed within Latin American design contexts during the same conjunctural moment as Cybersyn, Bonsiepe's critical insight configures the interface not as screen or dashboard but as an intermediate semiotic-material structure consisting of material elements (screens, controls, displays) and symbolic elements (rules, codes, conventions) through which information becomes accessible and meaningful.

Building on this, we extend this understanding towards the interface **as assembly**, a term to describe temporary, situated and relational configurations through which knowledge is actively co-produced in the workshop's participatory encounters. We adopt "assembly" rather than "assemblage" to signal our departure from post-structuralist assemblage theory (DeLanda, 2006; Deleuze & Guattari, 1987), instead emphasizing the active, collaborative work of assembling as an ongoing compositional practice through which participants arrange, combine, and rearrange materials to generate meaning.

Unlike conventions which require an interface provide access to pre-existing information, assemblies are *contingent* (emerging from specific moments of collaboration rather than predetermined structures), *material* (enacted through physical engagement with papers, images, and spatial arrangements), and *affective* (shaped by emotional responses, cultural memories, and interpersonal dynamics between participants). Through assembly, knowledge is not simply accessed or transmitted but collectively made through the processes of arranging, combining, and negotiating meaning.

This shift from interface-as-representation (static image of a system) towards interface-as-co-composition (dynamic space where relations are made and remade through practice) fundamentally reframes a practice of visualization from representational to generative logic. Rather than depicting a system from outside, the workshop interface operates with the system itself in flow and so makes visible the emergent processes of knowledge-making, the circulation of energies, and the recursive transformations as participants engage with materials, memories, and each other. Crucially, the workshop operates as non-technical interface where participants engage with tools, systems, and one another to compose new meanings through conversation, gesture, material selection, and negotiation. This understanding connects to what Parry (2022) terms "generative assembly", describing compositional practices that remain open to continued interpretation and reconfiguration rather than resolving into fixed outputs. Where Hall and Davila (2022) reveal how institutional "data assemblages" work to discipline perception through predetermined categories, our workshop assemblies create conditions for

participants to challenge and reconfigure such categories through collective visual practice (explored further in Sections 4 and 5).

The theoretical synthesis that emerges from these strands positions information design as practice of infrastructural care where the interface becomes space of shared meaning-making, the VSM becomes means of collective transformation and the historical conjuncture provides both resource and constraint for a practice of reimagining that is grounded in participation, cultural consciousness and an ethical commitment to the unfinished.

3. Methodology: Information Design as Energetic System

The approach outlined in this article positions participatory workshops as energetic infrastructures for collective knowledge-making rather than sites for consensus building or solely a means of data collection. The workshop methodology developed and employed operationalizes three sets of theoretical principles through a set of situated, material and affective practices. Taking a compositional approach, where participants actively construct knowledge through visual-material arrangement the research discussed here aims to extend a logical framework of representation beyond the depiction of pre-existing information.

This research develops and employs a critically reflexive workshop methodology that positions participatory design practice as both method and theoretical contribution. The approach outlined here positions participatory workshops as energetic infrastructures for collective knowledge-making rather than as sites for consensus-building or solely as a means for data collection. Our workshop methodology operationalizes the theoretical frameworks established in Section 2 through situated, material, and affective practices. Taking a compositional approach, where participants actively construct knowledge through visual-material arrangement, the research discussed here aims to extend a framework of representation beyond the depiction of pre-existing information.

Repositioning the workshop as interface (as explored in Section 2.3) has direct methodological implications for how participants encounter and engage with materials, activities, and one another. Rather than designing for participants as recipients of information, the methodology creates conditions where participants actively compose knowledge through material engagement, spatial arrangement, and collaborative negotiation.

This shapes three key aspects of participant experience: **materiality** (physical engagement which prioritizes tactile, embodied interaction over screen-based abstraction); **temporality** (the workshop's recursive structure allows participants to revisit, reinterpret, and reconfigure their contributions across activities rather than moving linearly through predetermined stages); and **positionality** (where participants' situated knowledge is positioned as equally valid to institutional data sources and the researcher's operational role as facilitator embedded within certain activities clear to all).

We reconceptualize the workshop as an information design interface: not a technical layer but a dimension for interaction where meaning emerges through encounter between

participants, materials, and systems. Drawing upon Bonsiepe's framing of interface as relational field (see Section 2.3), the workshop functions as a non-technical interface - a space where participants engage with tools, systems, and one another to compose new meanings through conversation, gesture, selection, and negotiation.

3.1 Adapting the Viable System Model

The workshop's methodological architecture draws directly from Beer's VSM while fundamentally reconfiguring its purpose and orientation. As established in Section 2.2, rather than seeking homeostatic stability through predictable feedback loops, our adaptation embraces generative friction and works with the productive tensions that emerge when different forms of knowledge encounter one another. This creates an experimental infrastructure for collective meaning-making that retains recursive logic while transforming affective orientation from organizational control toward collaborative emergence.

The workshop translates Beer's five systems (outlined in Section 1/Section 2.2) into participatory activities that maintain recursive structure while transforming orientation from organizational control toward collaborative emergence. Our adaptation channels the original VSM through participant experience (System 1), material facilitation (System 2), collective prioritization (System 3), critical visualization (System 4) and recursive reflection (System 5). This enables energetic flows - embodied, affective, relational - rather than data extraction.

3.2 Working with Structural and Contextual Knowledge

Our methodology challenges conventional conceptions of data and, rather than treating it as abstract, universal, or disembodied, we utilize a pluriversal framework where experience, memory, and relational knowledge are understood as equally meaningful forms of information.

The workshop employs two primary categories of compositional resources: **structural knowledge** (externally sourced materials representing institutional narratives, including government documents, policy screenshots, and media reports) and **contextual knowledge** (participants' lived experiences emerging through dialogue and material engagement). The innovation lies in treating these not as discrete inputs but as relational assemblies that generate energetic correspondences through friction, alignment, and transformation rather than resolution.

Data boards function as compositional resources within the workshop's System 3, materializing structural knowledge while creating conditions for participants to identify

moments of epistemic dissonance when official representations contradict or fail to accommodate lived experience. Rather than presenting information neutrally, these boards operate as curated points of friction that enable critical engagement with institutional narratives.

3.3 Generating Counter-Visualizations: Collage, Annotation, Re-diagramming

The workshop employs three interconnected visual methods that function as both practical techniques and theoretical interventions. These methods challenge conventional approaches which may privilege clarity, universality and the closure of definitive outcomes, instead supporting cultural responsiveness, energetic flows, and the ethics of the provisional.

Collage enables participants to create composite visual arrangements by combining institutional fragments from data boards with materials drawn from 1970s Latin American publications. This practice of cultural citation (introduced in Section 2.1) functions as counter-visualization that resists singular interpretation while supporting non-linear, associative sense-making. The collages operate as situated data visualizations that hold multiple perspectives in productive tension.

Annotation operates as collective meaning-making where participants collaboratively revisit and reinterpret their visual collages. Using everyday marking practices participants build shared vocabularies and interconnected interpretations. Annotation amplifies emotional, cultural, and political resonances while challenging dominant narratives embedded in both structural and contextual materials.

Re-diagramming functions as the researcher's responsive analytical method, creating visual translations of participants' work that maintain complexity while identifying emerging patterns and relationships. Rather than extracting meaning or translating work into more "legible" forms, re-diagramming generates visual records of attention that hold open contradictions, resonances, and potentialities while respecting participants' original expressions.

3.4 Ethical Considerations and Reflexive Practice

The methodology operates within an ethics of the provisional (see Section 2.3), deliberately embracing incompleteness as a generative design condition rather than tolerating it as a limitation. Both the pre-workshop survey and its activities were conducted with full ethical approval from the Faculty of Arts, Humanities and Cultures Ethics Committee at the University of Leeds. Participants were recruited through community organizations serving

Latin American communities in the UK, with attention to avoiding extractive research patterns. Informed consent processes emphasized the experimental nature of workshops and participants' right to engage provisionally - sharing what they chose while maintaining control over the extent of their disclosure and participation.

All materials created remain collectively owned, with participants retaining rights over their contributions and forms of circulation. When engaging analytically with participants' collages and annotations, re-diagramming practices deliberately maintain ambiguities and complexity rather than extracting or simplifying meaning. This generates diagrammatic records that respect the integrity of participants' original expressions while enabling further scholarly engagement and broader circulation.

3.5 Methodological Contribution

This methodology positions information design as infrastructural practice that creates conditions for shared meaning-making. The workshop operates as viable system whose recursive structure maintains capacity for collective sense-making through energetic flows rather than hierarchical control. By grounding practice in the interrupted trajectories of Latin American cybernetic traditions (Section 2.1), the methodology reactivates knowledge that has been displaced while remaining accountable to the communities who hold it. This approach, therefore, offers methodological alternatives that support culturally-responsive practice while generating theoretical language for understanding participatory encounters as legitimate sites of knowledge production.

4. The Viable System Model as Participatory Infrastructure

This section documents how the methodological framework outlined in Section 3 was implemented through a workshop held in July 2025 at the School of Design, University of Leeds. Rather than separating process description from analytical interpretation, we integrate workshop implementation, participant outputs and theoretical analysis to demonstrate how Beer's VSM can operate as an infrastructure for collective meaning-making. We begin by establishing the workshop context, followed by a sequential overview of the five activities that structured the workshop day. Then, through analysis of how each activity corresponds to one of Beer's five systems, we show how the VSM's recursive logic was translated into participatory design practice. Subsequent sections examine three key conceptual innovations that emerged through this translation: cultural citation as design method, the privileging of energetic flows over data flows and re-diagramming as analytical visualization practice. Throughout, we demonstrate how the workshop functions not as a preliminary research activity but as a viable system whose design directly shapes what can be collectively known, felt and articulated.

4.1 Workshop Implementation: July 2025

The first iteration of this reconfigured VSM involved twelve participants from Latin American countries including Chile, Peru, Uruguay, Colombia and Mexico, organized into three groups of 3-4 participants each. The composition was a deliberate choice to ground discussion in common experiences of migration to the UK whilst reflecting diversity of individual experiences across different national contexts. This regional focus aligns with the research commitment to cultural citation and the reactivation of Latin American design imaginaries, creating productive resonances between historical materials and contemporary lived experience.

Prior to the workshop, participants engaged in collective prioritization through an email survey, selecting three focus areas from six proposed themes: Wellbeing, Community Spaces and Transport, Employment and Opportunities, Housing, Migration, and Others. These themes emerged from community-based research highlighting specific challenges faced by Latin American diaspora communities in the UK, including systematic exclusion from official data collection, limited recognition in

policy frameworks and barriers to accessing public services (McIlwaine & Bunge, 2016).

The participants' prioritization process reflects a core commitment of this research: promoting individual agency and collective decision-making whilst resisting extractive research models that impose predetermined categories onto community experiences. The selected areas - Wellbeing, Community Spaces and Transport, and Employment and Opportunities - formed the basis of three data boards designed to anchor each group's visualisation activities and serve as a focus for insights generated by participants' contextual knowledge and dominant institutional narratives.

Group Composition

The grouping strategy reflected the workshop's theoretical commitment to distributed autonomy and collective knowledge-making, enabling dialogue across different Latin American national contexts whilst maintaining shared thematic focus and mirroring the VSM's emphasis on autonomous operational units (System 1) that can coordinate effectively (System 2) around collectively-determined priorities (System 3).

Group 1 (Wellbeing focus): Four participants from Uruguay, Mexico (2), and Colombia

Group 2 (Community Spaces and Transport): Four participants from Mexico and Chile (3)

Group 3 (Employment and Opportunities): Four participants from Chile (3) and Peru

4.2 Sequential Workshop Activities

The workshop structure translates the five adapted systems into participatory activities, with each group navigating the recursive process from individual experience-sharing through collaborative collage-making to collective annotation.

Activity 1: Introduction and System Orientation

The workshop began with an overview positioning the session as collective exploration of alternative data visualization approaches, using Project Cybersyn as historical reference point. This established conceptual groundwork for systemic

engagement by opening discussion about what constitutes "data" in culturally-responsive research practice.

Activity 2: Web of Worlds

The opening warm-up took the form of a collective exercise foregrounding Latin American epistemologies. Drawing inspiration from indigenous data visualization practices, participants created a physical network whilst sharing places of origin and community concerns. This established the workshop's epistemological foundation of foregrounding experiential knowledge.

Activity 3: Atomic to Molecular

Each group took part in an "atomic to molecular" activity beginning with participants noting individual concerns and then collectively developing categories from them, with individual notes being assembled into conceptual collections which were then prioritized for deeper exploration.

The three groups generated distinct categorical frameworks: Group 1 developed four categories prioritizing belonging and security; Group 2 created eight categories prioritizing public spaces, multiculturalism, and Latin American culture; Group 3 formulated five categories prioritizing cost of living and labour wellbeing.

Activity 4: Critical Laboratory for Pluriversal Data

This two-stage activity involved participants creating critical visualisations using fragments from data boards and 1970s Latin American publications. Participants selected, cut, arranged, and layered these materials collaboratively. In the second stage, participants annotated their collages to note emerging and associative meanings and create new interpretive layers. The resulting work held structural knowledge, cultural materials, and lived experiences as distinct yet interconnected elements (see Section 4.2, Systems 3 and 4).

Group 1 explored identity/belonging tensions, highlighting contrasts between Latin American communal life and English social atomization; Group 2 addressed structural inequalities and Latin American cultural invisibility; Group 3 approached wellbeing systemically, linking interconnected factors whilst noting both benefits and discrimination experiences.

Activity 5: Closing Reflection

The workshop concluded with critical, collective reflection. Each group presented their annotated collages, explaining their selections and compositional choices. Inter-group dialogue enabled participants to offer observations and reflect on resonances between different work. Participants shared impressions and collectively assessed their workshop outcomes, creating space for the methodology itself to evolve through participant feedback (see Section 4.2, System 5).

4.3 Five Systems Adapted for Participatory Design

System 1: Individual experience as source of variety

This system recognizes the unique perspectives, knowledge and lived experiences each participant brings to the workshop. Taking a deliberately plural approach, individual diversity is the raw material from which collective understanding emerges.

Thematic groups corresponding to specific community areas (healthcare, housing, migration, transport) serve as primary sites where participants' lived experiences enter the system. These units hold maximum variety of voices and perspectives at the 'atomic level' as individual contributions, with no synthesis or prioritization imposed. The diversity generated here provides essential input for subsequent processes, channelled through System 2 for collective synthesis in System 3.

How it operated

Participants worked in thematic groups focused on specific areas - healthcare, housing, migration, transport - where their individual experiences became the starting point. Each person contributed observations, concerns and insights without filtering or ranking. The range of perspectives that emerged (participants' different voices, priorities and ways of understanding each issue) became raw material to be collected, organized, and discussed collectively.

Individual sticky notes captured the variety of participants' experiences, revealing both positive affordances and structural challenges of life in the UK. Employment emerged as a site of contradictory experiences: notes highlighted "positivo ambiente laboral debido al politeness" (positive work environment due to politeness) and "buenos sueldos" (good salaries) alongside "más balance entre vida privada y

laboral" (more balance between private and work life). Cost of living generated particular concern, with multiple contributions noting "los arriendos no están regulados y son muy caros, con problemas (humedad, etc.)" (rentals not regulated, very expensive with problems like humidity) and the tension between "bienestar vs costo de vida" (wellbeing vs cost of life).

Healthcare experiences surfaced emotional and relational qualities often absent from institutional data: "falta de empatía emocional en los servicios de salud" (lack of emotional empathy in health services) pointed to gaps between access and quality of care. Safety appeared through both practical concerns - "salir de noche y no sentir miedo en las calles" (go out at night and not feel fear in the streets) - and systemic observations about "cuando las injusticias quedan impunes" (when injustices go unpunished).

Cultural adaptation emerged as a complex site of negotiation: while some appreciated that "nadie opina de tu cuerpo" (nobody comments on your body), others noted "no me acostumbro a la cultura en términos de la expresividad de las personas" (I don't get used to the culture in terms of people's expressiveness). Geographical distance from family appeared starkly: "lejanía física con los seres queridos" (physical distance from loved ones). Discrimination surfaced directly through notes marking "racismo y discriminación" (racism and discrimination) alongside observations about broader social patterns including "adicciones (desde la bebida pasando por las apuestas)" (addictions from drinking to gambling) and "corrupción" (corruption).

Positive experiences included access to cultural activities - "bastante cultura musical y actividades c/ música" (plenty of musical culture and activities with music) - and practical advantages like "acceso a viajes (mas económico'ish' que latinoamérica y más cercanía entre ciudades)" (access to travel, more economical-ish than Latin America and closer between cities). These contributions - unfiltered, unranked, and maintaining their contradictions - provide the essential variety that subsequent systems will organize without reducing, honouring the situated complexity of participants' diverse experiences as Latin American migrants in the UK.

System 2: Group coordination: transmission, rhythms and regulation

This system manages how individual contributions are shared, synchronized, and organized within the workshop environment. It includes the facilitator's role, the physical materials used for each activity and the temporal rhythms designed to enable participants to move between individual reflection and collective activity.

How it operated

Following their individual contribution, participants gathered their sticky notes onto shared A1 sheets, initiating the transition from atomic to molecular arrangements. This physical assembly transformed dispersed individual voices into visible spatial configurations where patterns and relationships could emerge.

The shared sheets became working surfaces where participants collaboratively arranged notes into provisional clusters. Rather than imposing predefined categories, groupings emerged through spatial proximity and thematic affinity as participants negotiated placement. Colour-coding of notes - one colour marking problems or challenges, another indicating strengths or things that work well - creates an additional dimension to each cluster, ensuring that affordances and difficulties remain visible within the same thematic constellation.

Four primary molecular groupings crystallised through this process: Bienestar laboral vs Costo de vida (work wellbeing vs cost of living) brought together observations about positive work environments, good salaries, and work-life balance alongside concerns about unregulated expensive rentals and the tension between wellbeing and cost of life. Salud pública (public health) clustered notes about healthcare access with observations about the lack of emotional empathy in health services. Seguridad (security/safety) grouped concerns about going out at night without fear alongside systemic observations about injustices going unpunished. Bienestar emocional y social (emotional and social wellbeing) formed the most capacious cluster, gathering cultural experiences (music culture, access to travel), personal freedoms (nobody commenting on one's body, doing exercise), challenges of cultural adaptation (not getting used to people's expressiveness), physical distance from loved ones, and broader social concerns including addictions, discrimination, racism, and corruption.

This spatial organisation made visible both convergences and tensions within the group's collective knowledge. The materiality of the A1 sheets and the repositionable

nature of sticky notes allowed ongoing negotiation: participants could move, regroup, and reconfigure arrangements as understanding developed through conversation. These molecular arrangements functioned as intermediate structures, being more organised than individual contributions yet not yet formalised into the definitive categories that would emerge through System 3's prioritisation activities.

Figure [X] demonstrates this emergent coordination, showing how individual sticky notes cluster into spatial groupings that begin the work of collective sense-making whilst maintaining the visibility of distinct voices within each constellation.

System 3: Collective resource allocation: higher-order regulation, decision-making, collective focus

This system involves the group's decisions about what matters most and where their attention should be directed within the workshop. Prioritization activities allow participants to negotiate shared values so their limited time and energy can be targeted towards collectively significant issues.

How it operated

Following the molecular clustering in System 2, participants engaged in prioritisation activities where their collective categories were synthesised and ranked by importance. This regulatory function required participants to negotiate which issues deserved sustained collective attention and where the workshop's limited time should be directed.

The workshop's data boards functioned as critical infrastructure scaffolding this process, presenting materials including publication fragments to illustrate both statistical realities and everyday challenges faced by Latin Americans in the UK.

Three thematic boards provided institutional context for participants' deliberations:

The Wellbeing & Quality of Life board presented health inequalities data, including hazard ratios showing higher prevalence of long-term conditions among Latin Americans compared to White British/Irish residents. It featured testimonies about language barriers ("The community needs a lot of help, to complete forms, to call the GP"), lack of culturally tailored mental health services, and the psychological impact of census invisibility - the experience of "not seeing oneself represented on a form" and having to tick "Other."

The Employment & Accessibility board documented workforce demographics, recent policy changes (the 48% salary threshold increase to £38,700, care workers stripped of rights to bring dependants) and gendered employment patterns showing migrant women experiencing lower employment rates after becoming parents. It included geographic distribution data and the observation that many Latin Americans work in "low-paid and insecure occupations such as cleaning, catering, or food processing roles".

The Community Spaces board explored institutional thresholds survivors face, the role of festivals and public spaces for marginalised communities, and community organising efforts. It featured calls for "the Latin American community unified" with "a unified voice and with their needs met," alongside the protest declaration "NÓS EXISTIMOS! ¡NO SOMOS 'OTHER'!"

Unlike Cybersyn's managerial screens presenting data for top-down decision-making, these boards functioned as compositional resources that participants actively engaged with, selected from, and reconfigured through their own interventions. The structural knowledge presented on the boards created productive friction with participants' contextual knowledge—their lived experiences that were materialized through the molecular clusters from System 2. This encounter enabled participants to identify moments where lived experience contradicted, complicated, or exceeded official representations.

Where participants' sticky notes about "falta de empatía emocional en los servicios de salud" (lack of emotional empathy in health services) met the board's data about insufficient mental health support and language barriers, connections formed between personal experience and systemic patterns. Where their observations about "buenos sueldos" (good salaries) and positive work environments sat alongside the board's documentation of low-paid insecure occupations and restrictive immigration policies, productive tensions emerged that signalled a necessary conversation.

The data boards situated participants' collective knowledge within broader informational and political contexts, making visible the range of concerns requiring prioritisation. By comparing their molecular arrangements with these institutional materials, participants moved from System 1's diversity and System 2's coordination

towards collective decisions about which issues would carry forward into System 4's critical visualization activities.

Figures [X], [Y], [Z] show the three data boards used in the workshop's prioritisation phase.

System 4: Critical reflection: environmental scanning through collage and annotation

This system opens space for participants to look outward, drawing from external resources including existing data sources formatted through conventional models of visualisation or representation. By engaging with materials beyond their immediate experience, participants situate their work within broader aesthetic, social, and informational contexts.

How it operated

Following prioritisation in System 3, participants engaged in System 4's two-stage collage and annotation activity where collectively identified categories were translated into critical visual narratives. This system enabled participants to move beyond internal group dynamics and engage with external information sources, creating assemblies using materials from two primary sources: fragments from the data boards (structural knowledge about health inequalities, employment barriers, community organising) and excerpts from 1970s Latin American magazines and publications (featuring militant graphics, advertising, lifestyle imagery, and political content). Participants worked collaboratively to select, arrange, and layer these materials, with their prioritised categories from System 3 serving as thematic anchors for composition.

The collages functioned as situated data visualisations that resist singular interpretation whilst supporting non-linear sense-making. Rather than producing seamless narratives, the assemblages maintained visible traces of selection and arrangement—institutional statistics sat alongside Spanish-language advertisements, protest declarations encountered lifestyle magazine imagery, employment data conversed with 1970s design aesthetics. This compositional approach embodies the practice of counter-visualization introduced earlier, creating conditions for participants to challenge institutional authority over representation.

The second stage involved collaborative annotation where participants revisited and reinterpreted their visual assemblages, engaging in critical reflection that functioned as both clarification and tactical interruption. These annotations amplified emotional, cultural, or political resonances embedded within the composite arrangements whilst challenging dominant narratives present in both structural and contextual materials.

Figure [X] shows participants engaged in the collage-making process, whilst Figure [Y] demonstrates a completed assembly. In this example, structural knowledge about employment barriers, mental health support gaps and community spaces is compositionally arranged with cultural materials including the Spanish phrase "LA CORDIALIDAD TIENE SENTIDO CUANDO SE TRADUCE EN SERVICIO" (cordiality makes sense when it translates into service) and English-language magazine content ("I want a friend... not just a contact"). The handwritten categories from System 2's molecular arrangements—"Trabajo vs Costo de vida" (work vs cost of living), "BIENESTAR Social" (social wellbeing), "TIEMPO DE OCIO" (leisure time)—reappear within the collage, creating visual continuity across the workshop's systems.

This two-stage practice demonstrates how System 4 fosters experimentation, imagination and a projection of possible collective futures. The collages operate as compositional resources that participants actively construct, enabling them to articulate relationships between institutional realities and lived experiences through visual-material arrangement rather than verbal argument alone. This approach aligns with Maulen's (2018) understanding of interface as counter-visuality, functioning as a critical device that challenges dominant visual authority by enabling users to reformulate outcomes based on local conditions and collective agency.

System 5: Identity and articulation without closure: gaining a meta-perspective

System 5 provides overall direction, anchors the workshop's orientation to knowledge and ensures the system can both recognize itself and project forward into future iterations through collaborative assessment. It operates recursively, appearing at both the workshop's opening and closing to establish and reflect upon the commitments to knowledge-making of the entire process. Rather than functioning as simple bookends, these moments enable the system to recognize its own identity and values whilst remaining open to transformation.

Opening: Epistemological grounding

System 5 first emerges in the opening warm-up activity, with a sensory exercise inspired by the Andean-Inca khipu that positions lived experience as legitimate knowledge. This establishes the tone for the entire workshop: whose voices matter, what counts as knowing and how the group will work together.

Closing: Collective meta-reflection

System 5 returns at the workshop's end when each group presents their work to the others, explaining what the assembly's images and arrangements mean to them and responding to questions and observations from other groups. This creates space for reflection across thematic areas, enabling connections and dialogue between groups working on different concerns.

Through this closing exchange, participants step back from their individual work and engage with the workshop as a whole system. They articulate what the process revealed, what might be done differently, and how the methodology itself could evolve. Participants collectively assess the workshop - and their contributions to it - recognizing what they've made together whilst shaping the workshop model's ongoing development.

How it operated

Opening: The khipu-inspired warm-up

The workshop began with a tactile, collaborative exercise that positioned embodied knowledge and relational connection as legitimate starting points for collective work. Participants introduced themselves whilst holding a ball of string - who they were, what they did and their reasons for attending: writing this information onto packing labels which were tied to the string. Each participant threw the ball to another person who repeated the process before throwing to someone else. This continued until everyone had announced themselves, materialising a complex web of connections between all participants with their labels suspended at various points across the network.

This opening established the workshop's epistemological values through material practice: knowledge emerges through embodied engagement and relational

connection, bodies and hands as thinking instruments, cultural references from Latin American traditions carrying authority and collective meaning-making beginning with what each participant brings. The khipu reference functioned as cultural citation, activating a situated knowledge system that predates colonial categories whilst connecting to participants' diasporic identities. The physical web created through the string-throwing process made visible the relational structure of the group whilst foregrounding tactile, non-textual ways of knowing. This warm-up set the tone for all subsequent systems and signalled whose voices would matter, what would count as knowing, and how the group would work together.

Figure [X], [Y], [Z] show participants engaged in the khipu-inspired opening activity.

Closing: Collective reflection and presentation

At the workshop's end, each thematic group presented their annotated collages and participants explained their visual assemblies - describing materials selected, their arrangement and identifying meanings that emerged through layering structural knowledge, cultural materials and lived experiences. This sharing created opportunities for cross-pollination across thematic areas as each group discussed their work.

Following each presentation, inter-group dialogue enabled participants to offer observations, ask questions and reflect on resonances or tensions between their work. Participants collectively assessed what the workshop revealed, what surprised them, what felt productive and what could be done differently in future iterations.

This closing activity enabled participants to step back from individual group processes and engage with the workshop as a whole system. Through presenting and receiving feedback on their assembly, participants contributed to the construction of a shared semantic field whilst articulating how the workshop methodology itself might evolve.

This recursive structure - opening with epistemological grounding, closing with collective reflection - demonstrates how System 5 enables the workshop to maintain coherence without imposing closure, allowing for momentary coherence that recognizes what has been made whilst remaining open to ongoing reinterpretation and adaptation.

4.4 Cultural Citation as Information Design Practice

Central to the workshop's approach is "cultural citation", the intentional reuse and recontextualization of Latin American visual materials from the 1970s alongside contemporary institutional documents within the workshop. This functions as both methodological innovation and political intervention, operationalizing the theoretical commitment to reactivating interrupted design trajectories discussed in Section 2.1.

Collage materials used in the July 2025 workshop were drawn from an archive of magazines and publications from the late 1960s and 1970s, sourced from open-access repositories including Archive.org's magazine collection. The selection spanned four thematic categories: Latin American political publications (*Insurgencia Popular*, *FLAMA*, *Caretas*, *Gente*) featuring militant graphics, protest photography, and coverage of dictatorships; international lifestyle magazines (*Time*, *Bunte*, *Hymy Lehti*) representing consumption and modernity; science and technology publications (*Information Display*, *Mad Trash*) offering futuristic visual languages and countercultural aesthetics; and nature/travel materials (*National Geographic*, *Australian Country Magazine*, *State Farm Road Atlas*) providing landscapes and territorial imagery.

The curated visual materials enabled participants to engage in cultural citation alongside contemporary institutional fragments presented on the workshop's data boards. Drawing on Kyle Parry's (2022) framework for understanding assembly as cultural form, these collages function as "combination[s] of expressive elements that maintain and seize on the appearance of selection and arrangement" (p. 3). Rather than resolving disparate materials into seamless wholes, the workshop's compositional practice creates assemblies in which constituents "remain apart from each other as separate, discernible elements" while simultaneously entering "into conversation, collaboration, and sometimes conflict" (pp. 4–5). The collages thus generate discontinuous fields of visual meaning where historical and contemporary materials engage in dialogue without resolution - what Parry elsewhere calls the "active appearance and interactive potential of selection and arrangement" (2018, p. 553).

When participants incorporated 1970s imagery of community organizing, technological experimentation, or collective decision-making into their contemporary

collages, they initiated processes of visual re-narration that connect present struggles to historical trajectories of resistance and alternative imagination. This approach challenges the extractive temporalities often embedded within information design, where historical materials serve merely as illustration or aesthetic resource. Instead, cultural citation treats the past as presence to be negotiated with—opaque, incomplete, yet continually relevant. As Parry argues, assembly-based cultural forms are distinguished by their capacity to maintain "the expressive strategy of media assembly" (p. 22) through visible acts of selection and arrangement that resist narrative closure.

The practice also functions as infrastructural care, maintaining connections to interrupted design trajectories and alternative technological imaginaries rather than allowing these experiments to remain archived or forgotten. Cultural citation thus operates not as nostalgic reference but as critical activation, recomposing historical fragments within new configurations that shift context and resonance while preserving the tensions between past and present.

4.5 Energetic Flows vs. Data Flows

A fundamental distinction underlies the workshop's operation: the privileging of energetic flows over data flows. This theoretical repositioning operationalizes the recursive principles of Beer's VSM through affective and relational rather than purely cognitive registers.

Traditional applications of the VSM, including Cybersyn's original implementation, relied on data flows: discrete packets of information transmitted, processed, and acted upon through systematic channels. These flows enabled coordination and decision-making but operated according to logics of extraction, abstraction, and control. The workshop model instead foregrounds energetic flows: the movement of emotional, cognitive, social, and cultural forces that circulate, collide, and reconfigure through participatory encounter.

Energy, unlike data, is always relational, existing between bodies, materials, and their positions. It is experienced sensorily, socially, and temporally, creating conditions for meaning-making that cannot be reduced to information processing. This distinction aligns with Parry's (2022) observation that assembly as cultural form emphasizes the "porous and... democratic" relationships between constituents,

where "different constituents function like citizens" maintaining distinct positions while engaging in collaborative and sometimes conflictual relations (p. 4). Energetic flows allow different forms of knowledge to circulate, interact, and sometimes conflict without being reduced to uniform information. Energetic flows preserve the relational, messy, co-existing nature of different ways of knowing much like Parry's articulation of assembly preserves the visibility and agency of its constituent parts.

As Figure [X] shows, each system channels distinct yet interconnected energetic flows through the workshop experience. System 1 operates through embodied insight, drawing on personal experiences and individual environments as participants' lived knowledge enters the collective space. These individual energies flow into System 2, which orchestrates social coordination by managing the interplay between resonance and friction, calibrating rhythms of interaction that maintain productive tension while enabling meaningful dialogue across difference.

System 3 allocates collective attention by synthesizing structural reference points (institutional data and frameworks) with contextual reference (participants' situated knowledge), creating shared focus through negotiation between external and experiential sources. The focused attention flows into System 4, which facilitates creative synthesis through dialogue, alignments, and experimentation, enabling speculative composition that produces new visual assemblies and unexpected associations.

System 5 operates recursively across the entire workshop VSM, enabling narrative disruption through meta-reflection, framing, speculation, and reorientation. Rather than flowing from one system to the next, System 5's energies circulate throughout—establishing epistemological orientation at the workshop's opening and returning at its close to enable participants to contextualize their collective outputs whilst maintaining openness to emergent meanings.

The diagram reveals how these energies circulate through the workshop space, generating shared meanings, memories, ideas, and context that accumulate and transform throughout the process. Energy flows between systems create feedback loops: individual experiences (System 1) are coordinated socially (System 2), focused collectively (System 3), synthesized creatively (System 4), and reflected

upon recursively (System 5), with each stage generating energies that feed back into and reshape earlier processes.

This energetic approach transforms the workshop from a mechanism for extracting knowledge into a viable system of shared meaning-making. Rather than operating through hierarchical control or predictable feedback loops, the workshop sustains itself through a maintenance of viability and adaptation - where energy, attention, and materials circulate to maintain vitality and openness to transformation. The system demonstrates a capacity to remain adaptive and vital through many small responsive acts rather than through a single controlling mechanism.

The shift from data to energy also reflects the methodology's commitment to cultural responsiveness. Many participants come from communities where knowledge is understood as relational, processual, and collectively held rather than individually owned or institutionally controlled. Energetic flows better accommodate these epistemological orientations, creating space for forms of knowing that resist abstraction or discrete categorization.

4.6 Re-diagramming as Analytical Visualization

The researcher's engagement with participants' annotated collages through re-diagramming extends the counter-visualizing work participants initiated, operating as responsive analysis that maintains complexity and ambiguity while identifying emerging patterns and relationships. Re-diagramming functions as material translation, rendering visible the associative logics and energetic flows embedded within participants' collages and annotations.

Rather than extracting meaning or translating workshop artefacts into conventional analytical categories, this approach operates as relational engagement between researcher and participant knowledge. This method maintains what Parry (2022) identifies as assembly's characteristic quality: the preservation of constituents as "separate, discernible elements" that remain "in distinct and meaningful positions" whilst generating new interpretive possibilities through their configuration (pp. 4–5). Working with photographed collages and transcribed annotations from the July workshop, the researcher creates visual maps that preserve the spatial relationships, layering, and juxtapositions in participants' original assemblies whilst developing new analytical interpretation.

Figures [X], [Y], and [Z] illustrate this approach in practice. Figure [X] shows a complete annotated collage produced by participants during System 4, combining structural knowledge from data boards, cultural materials from 1970s publications, and handwritten annotations including the molecular categories from earlier systems—"Trabajo vs Costo de Vida" (work vs cost of living), "BIENESTAR SOCIAL" (social wellbeing), and "TIEMPO DE OCIO" (leisure time). The assembly includes Spanish-language text ("LA CORDIALIDAD TIENE SENTIDO CUANDO SE TRADUCE EN SERVICIO"), English magazine fragments ("I want a friend... not just a contact"), and institutional data about employment, mental health, and community spaces.

Figure [Y] presents the researcher's initial re-diagramming, using colour-coding to distinguish the three primary material sources within the assembly. This analytical layer reveals how participants organized different forms of knowledge spatially across their collage—institutional fragments, cultural citations, and interpretive annotations occupy distinct yet overlapping zones, creating a visual field where structural and contextual knowledge enter into dialogue.

Figure [Z] deepens this analysis by separating the assembly into its three constituent layers: old magazine cut-offs (cultural citation materials from 1970s Latin American publications), data board excerpts (structural knowledge documenting systemic challenges faced by Latin American communities in the UK), and written annotations (participants' own categorizations and interpretive marks). This exploded view makes visible how meaning emerges not from any single source but through compositional relationships between these distinct forms of knowledge - what Parry describes as constituents that "remain apart from each other as separate, discernible elements" whilst simultaneously entering "into conversation, collaboration, and sometimes conflict" (2022, pp. 4–5).

This analytical visualization maintains accountability to participants' original work while generating new interpretive layers. The re-diagrams function as tools for thinking-through the materialities of knowledge as emergent, partial, and provisional rather than as explanatory devices. They create diagrammatic records of attention capable of holding open contradictions, resonances, and potentialities of participatory encounter.

Critical to this approach is its refusal of analytical closure. The re-diagramming process deliberately maintains ambiguities and complexity rather than translating participants' work into more "legible" forms. What emerges are not coherent explanatory maps but visual records of associative logics that remain available for continued interpretation and reinterpretation—assemblies that maintain their "interactive potential" (Parry, 2022, p. 22) even as they undergo analytical transformation.

The researcher's responsive visual analysis creates feedback loops between collective meaning-making and analytical interpretation, generating visual records that can be shared back with participants and circulated in broader academic contexts while creating opportunities for continued dialogue and collaborative interpretation of the workshop process and outcomes. This positions re-diagramming as both analytical method and ethical practice, maintaining the provisional orientation that characterizes the methodology as a whole whilst honouring the complexity of participants' original compositional work.

4. Discussion: Information Design as Cultural Practice

This section examines the broader implications of our reconfigured VSM workshop methodology for information design practice, moving beyond the specific case examples to consider how this approach reframes established approaches and opens new directions for the field.

This section examines what it means to ground information design in specific cultural trajectories, historical consciousness and relational epistemologies as not merely a theoretical position or proposition, but as methodology that aims to reshape what information design produces and how it produces meaning. It contributes to information design's emerging cultural turn with a recognition that situated knowledge practices and meaning-making processes - and multiple valid ways of knowing - should move beyond surface-level adaptation to make a generative contribution to how information design recognizes, values, and operationalizes cultural difference.

This research has generated three interconnected methodological innovations that trouble conventions whilst offering an approach with potential for reorientation and reconfiguration. Cultural citation demonstrates how historical residues from interrupted design trajectories can function as active conceptual resources. Energetic flows as our operative logic foregrounds transformative experience, affective engagement and relational dynamics. Participatory workshop infrastructures, and their materialization, generate ongoing capacity for collective sense-making.

The innovations outlined here emerge from Latin American cybernetic traditions that were themselves interrupted, suppressed or excluded - raising critical questions about how culturally-situated methodologies can contribute to a field without being absorbed into the conventions or dominant frameworks that are being challenged. As information design's cultural turn demands, to move beyond a superficial translation or adaptation requires the examination of conditions which enable culturally-grounded practice to operate, circulate and shape the field's evolving understanding of its purposes and possibilities.

We therefore address three interconnected dimensions of significance: How does embracing the provisional as ethical stance reshape information design's relationship to certainty, expertise, and cultural complexity? How does centring embodied, situated knowledge through practices like cultural citation and material engagement challenge information design's disciplinary commitments to abstraction and universal principles? And how might positioning workshops as infrastructural deliverables reconceptualize information design's outputs and its contribution to equitable knowledge representation?

Section 5.1 explores how the ethics of the provisional positions incompleteness, ambiguity, and partiality as generative design conditions, together with implications for how designers engage with cultural difference, how design education prepares practitioners and how professional relationships are structured. Section 5.2 examines how situated information design might challenge conventions or assumptions about effectiveness and require new approaches for commissioning, evaluating, and circulating work that remains accountable to specific communities and epistemologies. Section 5.3 addresses how reconceptualising workshops as infrastructural deliverables reframes information design's contribution from discrete visual artefacts to systemic capacities for ongoing meaning-making, whilst acknowledging the institutional and economic realities that shape such practice.

This discussion looks to articulate how information design grounded in Latin American cybernetic traditions and relational epistemologies contributes to the field's cultural turn as generative reorientation that offers methodological frameworks, theoretical language, and demonstrated alternatives to extractive research patterns whilst maintaining accountability to the cultural trajectories from which this work emerges.

5.1 The ethics of the provisional

Information design's pursuit of clarity, completion, and universal legibility has been challenged from multiple critical perspectives. D'Ignazio and Klein demonstrate how

data science's universalist frameworks systematically erase the situatedness of knowledge, flattening "specific people in specific circumstances—cultural, historical, and geographic" into abstracted representations that claim objectivity (2020, p.83). Kennedy et al. reveal how visualization conventions—geometric lines, abstraction, the pursuit of tidiness—work rhetorically "to imbue visualisations with the quality of objectivity (which brings together other qualities such as transparency, scientificness and facticity)" whilst simultaneously obscuring the complex social realities these conventions purport to represent (2016, p.716). Haraway's essential work on situated knowledges establishes that partiality is a fundamental characteristic of knowledge rather than limitation and so challenges the very possibility of a comprehensive, objective representation or visualisation of data (1988).

In response, the ethics of the provisional positions incompleteness as deliberate and critical, and not as methodological compromise or failure to achieve certainty. Provisional work is not simply unfinished due to a lack of resources or time but through the intentional resistance to closure as political and epistemological commitment. Drawing inspiration from architect Cedric Price's commitment to unfinished frameworks that anticipate change and user appropriation, we position the provisional and incompleteness as a productive design condition that creates space for disruption, negotiation, and divergence. Price regarded this approach as a form of calculated uncertainty - the seemingly paradoxical attempt to design buildings whose capacity to be transformed was deliberately built into their material and spatial organization while also acknowledging that any future transformation would remain "unavoidably incalculable" (Aragüez, 2021, p. 122).

The ethical force of the provisional emerges from this redistribution of interpretive authority. Design often produces artefacts which claim completeness, determining what matters, how things should be understood and when any interpretation ends. This exercise of closure carries particular consequences in a discipline with particular capabilities to work across cultural difference: the reduction of complex, contested, or irreducible cultural meanings through conventions producing legible forms that often serve institutional rather than community needs. Kennedy et al.'s analysis of how conventions construct objectivity whilst "obscuring or flattening more

complex social realities" reveals the political work that such tendencies towards clarity perform (2016, p.716).

Provisional approaches create space for continued negotiation where communities retain agency over how their experiences are interpreted and circulated. The annotated collages produced in our workshop exemplify this: rather than translating participants' situated knowledge into "clearer" institutional visualizations, the methodology generates artefacts that remain open to reinterpretation, contestation, and appropriation. This openness functions as accountability mechanism, keeping the work answerable to participants rather than abstracting their knowledge into universal claims that can circulate independently of their control.

The provisional also raises questions of time and commitment and of how work unfolds over time and how relationships are shaped by time: how and when such work ends and who decides.

Provisional work instead establishes ongoing relationships where meaning-making continues beyond the time-bounded limits of a workshop experience which is defined by fixed start and end points, where participants disperse afterwards and when the work's material outputs are produced during this time. While the workshop as social encounter ends by necessity, the epistemological work it initiates does not: the annotated collages produced by participants make no claim to resolve the complex issues of wellbeing, employment, or community access that are being address. Rather, they function as provisional articulations that remain available for continued interpretation, contestation, and appropriation beyond the workshop boundaries. When participants create composite collaged visualizations they generate artefacts that resist singular reading precisely because their meanings cannot be exhausted within the session that produced them. System 5's closure function in our workshop model, therefore, should be understood not as one of finality but as an opportunity for recursive reflection - a moment which allows the system to recognize itself without claiming to have completed its inquiry. When workshop participants present their work to other groups and offer feedback, they articulate what has been made so far rather than what has been resolved. This recursive structure creates conditions for this methodology to evolve through participant reflection and feedback, ensuring

that subsequent iterations can build upon rather than simply repeat previous sessions.

The provisional also establishes different temporal relationships between designers and communities. Provisional work creates conditions for ongoing engagement where meaning-making continues beyond the designer's intervention. This temporal extension proves particularly significant for culturally-responsive practices as outlined here, where communities' relationships to their own knowledge, memory and representation remain dynamic rather than fixed.

Embracing the provisional therefore requires an ongoing reconceptualization of design expertise and for developing skills in creating conditions where complexity can be held, where multiple interpretations coexist productively and where the work remains available for futures we cannot predict or control. Such a shift to facilitator-of-conditions fundamentally reorients disciplinary ethical commitments and professional identity, offering a framework for how the field can engage with cultural difference by creating infrastructures through which communities represent themselves.

Possible implications

5.2 Centring other perspectives towards visibility

D'Ignazio and Klein argue that data feminism requires "more inclusive knowledge production by centering the perspectives—or standpoints—of groups that are otherwise excluded from knowledge-making processes" (2020, p.83). This proves particularly urgent in terms of the needs of Latin American diaspora communities in the UK who navigate what McIlwaine and Bunge (2016) term a struggle "towards visibility", often experienced by exclusion from census categories, policy frameworks or lack of institutional recognition.

In response, our methodology explores workshops practice as ways to unearth or materialise embodied knowledge: the understanding that comes from "people as

living, feeling bodies in the world" (D'Ignazio and Klein 2020, p.73), where participants embodied engagement with materials, histories and each other generates meanings that other frameworks might fail to capture. Drawing on D'Ignazio and Klein's framework for valuing embodied, situated knowledge, this approach operates through three interconnected practices that collectively challenge information design's disciplinary tendencies toward abstraction: cultural citation as method for activating situated histories, material engagement as social craft practice rather than screen-based interaction and collective annotation as embodied meaning-making that resists singular interpretation.

Cultural citation as situated practice

As D'Ignazio and Klein stress, "all forms of knowledge are situated...produced by specific people in specific circumstances—cultural, historical, and geographic" (2020, p.83). Cultural citation makes this situatedness tangible and actionable within workshop practice. The 1970s materials carry traces of Latin American cultural history and are not regarded as neutral resources but a presence to be negotiated with - materials that participants can claim, reinterpret, and reconfigure through their own choices about selection, arrangement, and combination. This proves significant for communities usually excluded from knowledge-making activities since it works to redistribute authority over what matters as valid reference material. Rather than privileging institutional data sources, academic research and official statistics as legitimate foundations for visual communication, cultural citation positions community cultural memory - embodied in magazines, protest graphics, and vernacular design - as a valid conceptual resource. This suggests that any attempts to center excluded perspectives requires more than including diverse content within existing frameworks and, instead, demands detailed consideration of materials, methods and vocabularies of visual form to enable participants to work from their own situated standpoints. Cultural citation offers one such approach: a practice of designing with particular cultural materials rather than for any institutional or disciplinary legibility or legitimacy.

Material engagement and embodied knowledge

The workshop's emphasis on physical materials - cutting and arranging collage elements, writing annotations by hand, moving between individual sticky notes and shared A1 sheets of paper - responds to D'Ignazio and Klein's observation that "humans are not two eyeballs attached by stalks to a brain computer. We are embodied, multisensory beings with cultures and memories and appetites" (2020, p.85). By privileging sensory and bodily dimensions of knowledge-making and material engagement, participants are encouraged to think through their hands as much as their eyes while acknowledging alternative forms of knowing that emerge through tactile engagement and spatial arrangement, and ones practiced in the physical presence of others. Such an embodied dimension proves significant for communities navigating institutional invisibility. Official data systems represent Latin American diaspora communities through categorical abstractions that strip away the textured, relational, affective dimensions of people's lived experience. When participants physically compose counter-visualizations through collage, they are engaging in knowledge-making that resists such abstractions. D'Ignazio and Klein's concept of positionality - "how individuals come to knowledge-making processes from multiple positions, each determined by culture and context" (2020, p.83) - helps clarify what's at stake here and makes positional choices visible and discussable: each participant's positionality influences what materials they select, how they arrange them and what they choose to annotate.

Collective annotation as multi-perspectival meaning-making

D'Ignazio and Klein argue that practices of representing complex social realities should embrace "multiple perspectives and positionalities" whilst avoiding the false binary between reason and emotion (2020, p.75). Our workshop's use of collective annotation enacts this intention: participants revisit their collages together, adding handwritten annotations by underlining, circling, arrows or making marginal notes that amplify existing meanings, identify connections, and challenge emerging interpretations. Embodied and everyday literacies of annotation are reactivated as tools for critical knowledge-making. The visible, handwritten nature of annotations allows analytical observations, emotional responses, and political critiques to coexist as equally valid forms of knowledge, resisting conventions of hierarchy that privilege 'objective' analysis over 'subjective' feeling. The embodied, collective nature of

annotation also creates conditions for what D'Ignazio and Klein describe as visceralization: "representations of data that the whole body can experience, emotionally as well as physically" (2020, p.85). When participants gather around a shared collage, pointing to elements, reading annotations aloud, discussing resonances and disagreements, they engage with knowledge through their social and spatial proximity, with their voice and gesture and through a shared physical and emotional experience of making meaning together - these visceral dimensions carry forms of knowing that cannot easily be accommodated in other ways.

5.3 Workshop Infrastructures as Design Deliverables

Positioning workshops as infrastructural deliverables rather than preliminary research activities fundamentally reconceptualizes what counts as design output. Their value lies not only in what is produced as artifacts but in what they enable as ongoing capacity for collective sense-making. Hall and Davila call for critical visualization practices that "reveal or glimpse the assemblage—and to understand the relations through which power is configured and practiced' within institutional data systems (2022, p.12). Kennedy et al. demonstrate how design conventions—geometric abstraction, tidiness, systematic arrangement—construct authority through claims to objectivity whilst obscuring the political choices embedded in representation (2016, p.716). In response, and rather than producing visualizations that expose assemblages to external audiences, our workshop infrastructures constitute temporary assemblages where participants directly engage with, contest, and reconfigure institutional categories through collective visual practice. Workshop infrastructures deliver systemic capacities: designed processes that enable communities to engage complex information, negotiate meaning collaboratively, and generate their own visual responses to structural challenges. The material outputs from our workshop - pre-prepared data boards, participants' annotated collages, researchers' re-diagrammed analyses - exemplify how infrastructural design operates through compositional rather than representational logics while resisting existing disciplinary conventions. This refusal constitutes methodological intervention, workshop artefacts make visible their own constructed, partial,

collaborative nature as provisional assemblages holding multiple perspectives in open and productive tension.

Workshop infrastructures extend beyond the temporal boundaries identified in 5.1 through three interconnected tactics. First, the material artefacts produced continue to circulate and generate meaning after the session ends, inviting continued interpretation. When workshop collages are photographed, shared with participants, or presented in other contexts, they function as ongoing prompts for reflection rather than closed statements. Second, the relational capacities developed in the workshop such as skills in collaborative meaning-making, a confidence in engaging institutional data critically and the recognition of peers as legitimate knowledge-holders persists with participants, and has potential to shape their subsequent encounters with information systems. Lastly, the methodology itself become a collection of replicable infrastructures: the VSM reconfiguration, data board design principles, and collage/annotation practices can be adapted for different communities and contexts thereby creating distributed methods for culturally responsive design practice.

Documentation practices prove crucial for workshop infrastructures to circulate and influence beyond their immediate contexts. Unlike finished visualizations that aim to communicate through a self-contained clarity, workshops generate meaning through situatedness and embodied encounter. Documenting this presents a challenge which requires approaches that maintain complexity rather than translating or simplifying into conventional formats. The re-diagramming method introduced in Section 4.5 offers one such approach: creating visual analyses that preserve spatial relationships, layering, and associative logics from participants' original work whilst developing new interpretive layers. These re-diagrams therefore function as interfaces between workshop practice and broader discourse and dissemination, enabling circulation whilst resisting the flattening or smoothing that documentation practices often perform.

5. Conclusion

List of references

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