

Listening and Design as Cultural Infrastructure: Rethinking Innovation Through a Relational and Situated Approach

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Abstract: In contemporary innovation discourse, design is frequently framed as a solution-oriented and technology-driven practice focused on efficiency, scalability, and measurable outputs. While this paradigm has generated significant advancements, it often marginalizes relational, cultural, and long-term dimensions of project-making. This article adopts a theoretical and practice-informed research approach, combining critical literature review with reflective analysis of recurring design practices, to propose a framework that reconceptualizes design as cultural infrastructure rather than as a sequence of isolated solutions. Drawing on design theory, sound studies, and socio-technical scholarship, the study introduces listening as a situated epistemic and methodological practice that shapes how design engages with contexts, technologies, and knowledge production. Through a critical examination of solutionism and an analysis of infrastructural approaches to design, the article argues that innovation emerges from sustained socio-technical ecologies rather than punctual interventions. The framework is further discussed in relation to territory, rural transformation, and culturally situated technology. By reframing design as a long-term relational and infrastructural process, the article contributes to ongoing discussions on responsible innovation and advances a conceptual shift from solution-oriented intervention toward situated, relational, and context-sensitive design practices.

Keywords: *Design theory; Cultural infrastructure; Listening; Relational innovation; Solutionism; Socio-technical systems; Situated design*

1. Introduction

In contemporary debates on design and innovation, design is increasingly associated with the capacity to produce efficient, scalable, and measurable solutions, in line with paradigms borrowed from engineering, management, and applied sciences. Within this framework, the value of design is often assessed through the performance of its outputs—replicability, scalability, and measurability—an orientation further reinforced by digital platforms and data-driven systems that render projects readable as rapid and controllable interventions. While this approach has undoubtedly fostered innovative products, services, and systems, it has also progressively narrowed the epistemic scope of design, reducing it to a predominantly instrumental function aligned with economic and technological priorities[1-3].

As Victor Papanek, Tony Fry, and Bruno Latour have argued, reducing design to problem-solving risks obscuring its cultural, political, and relational dimensions, as well as its long-term implications. The emphasis on rapid, scalable solutions—often sustained by an uncritical faith in technological efficacy—tends to marginalize situated, processual, and non-quantifiable forms of knowledge. Yet such forms of knowledge are central in socially and ecologically complex contexts, where design does not confront clearly bounded problems but evolving situations shaped by historical, environmental, and cultural tensions that resist linear and predictive models of intervention[1-3].

In response, recent scholarship has sought to reconceptualize design as a cultural, relational, and situated practice. From this perspective, design exceeds the production of artifacts and instead configures processes and relationships that enable interaction among subjects, environments, and knowledge systems over time[4,5]. This shift from outputs to processes does not reject technology, but repositions it within broader socio-technical ecologies, where digital tools and infrastructures function as cultural mediators rather than autonomous solutions. Such repositioning is particularly relevant in contexts marked by ecological fragility, cultural plurality, and accelerated territorial transformation, where rigidly solution-oriented approaches reveal significant limitations[4,5].

Despite these contributions, current design research still lacks a coherent framework that integrates relational, cultural, and infrastructural perspectives into a unified understanding of innovation processes. This article addresses this gap by proposing design as cultural infrastructure grounded in listening as an epistemic and methodological practice.

Building on these premises, the article proposes to rethink design not as a purely technical apparatus, but as an assemblage of practices, relations, and technological dispositifs capable of sustaining long-term processes of transformation. Within this framework, listening is introduced as a central epistemic and methodological practice for relational and situated innovation. Rather than functioning as a preliminary phase of analysis, listening shapes how design engages with contexts, mediates between different forms of knowledge, and integrates technological systems within situated processes. The aim is not to replace existing paradigms of innovation, but to critically extend them, opening space for an approach to design that aligns technological development with cultural sensitivity and contextual responsibility.

2. Research Questions

Given the theoretical repositioning outlined above, this article critically examines the role of design within contemporary innovation processes, challenging a predominantly technical and solution-oriented understanding. Since design operates in socially, ecologically, and technologically entangled environments, it becomes necessary to clarify which forms of knowledge and which modes of intervention are adequate to such conditions. Innovation, in this sense, cannot be reduced to the introduction of new solutions or technologies; rather, it must be understood as a situated process unfolding over time through relations, mediations, and contextual engagement.

The first question concerns the possibility of rethinking design beyond problem-solving and conceptualizing it as a cultural and relational practice. This implies shifting attention from outputs to the configuration of processes and conditions that enable interaction among subjects, environments, and knowledge systems. Design, in this perspective, operates not as a function of optimization but as a practice capable of shaping temporalities, mediations, and socio-technical relations.

The second question addresses the role of listening within design processes. If design is understood as situated practice, how can it generate knowledge through attentiveness to contexts and differences? Listening is not treated here as a preliminary phase but as an epistemic and methodological orientation that shapes engagement, priorities, temporalities, and the integration of technologies within the project.

The third question concerns long-term implications. If design operates through relational processes grounded in listening, can these practices be understood as cultural infrastructures rather than episodic interventions? This entails examining how design may sustain continuity, shared learning, and non-linear innovation capable of evolving within transforming socio-technical environments. Accordingly, the article is structured around three research questions:

- 1) How can design be reconceptualized as a cultural and relational practice beyond a purely technical and solution-oriented understanding of innovation?

- 2) How can listening function as an epistemic and methodological practice within design processes?
- 3) In what sense can listening-based design practices operate as cultural infrastructures capable of sustaining long-term innovation?

Rather than offering universal answers, these questions seek to construct a conceptual framework for understanding design as a situated, relational, and responsible form of innovation in technologically mediated environments.

3. Methodology

This article adopts a theoretical and practice-informed research approach, situating itself within a tradition that recognizes the epistemic value of design, artistic, and cultural practices. In this perspective, knowledge is not produced solely through standardized empirical protocols, but emerges from the reflective interaction between theory, situated experience, and operational practices. Such an approach is particularly suited to investigating design in complex environments, where the boundaries between research, project development, and cultural intervention are porous and continuously redefined.

Concretely, the research process combines three interrelated components: (1) a critical synthesis of literature across design studies, sound studies, and socio-technical theory; (2) a comparative analytical reflection on recurring design practices such as long-term residencies, situated listening practices, and participatory territorial processes; and (3) a reflexive interpretation of these practices as methodological configurations rather than empirical case studies. These components are used to identify shared patterns, conceptual tensions, and methodological implications that inform the proposed framework.

Methodologically, the study is grounded in this critical synthesis of literature in design studies, sound studies, and cultural ecology, with particular attention to contributions that question solution-oriented, technocratic, and universalizing approaches to innovation.

Rather than reconstructing an exhaustive state of the art, the review identifies key concepts and theoretical tensions useful for reframing design as relational, situated, and long-term oriented practice. This includes reflections on contemporary technologies—digital platforms, intelligent systems, and sensory mediation devices—understood not as neutral tools or autonomous solutions, but as elements embedded within complex socio-technical ecologies [5].

In addition, the article develops a comparative reflection on recurring types of design practices, such as long-term artistic residencies, situated listening practices, and territorially embedded participatory processes. These practices are not presented as empirical case studies in a strict sense, but as recurring operational configurations used analytically to identify methodological patterns, project postures, and shared conceptual implications. They allow observation of how design can operate beyond punctual intervention, through extended temporalities and relational forms of engagement involving both human and non-human actors.

Listening occupies a central methodological role within this framework. It is understood as an epistemic practice that shapes not only engagement with contexts, but also the conduct of research itself. Listening informs modes of observation, interpretation, and design, fostering attentiveness to difference, temporality, and relational complexity. In this perspective, the technologies employed in design processes—recording tools, digital infrastructures, sensing systems, data visualization platforms—are treated as relational mediators. Their function is not the extraction of information, but the facilitation of attention, shared interpretation, and situated learning. Overall, the article adopts a reflexive methodological stance that treats situatedness and partiality as analytical resources rather than limitations. The aim is not to propose prescriptive models or universal generalizations, but to construct a transferable interpretative framework adaptable to diverse contexts. This framework seeks to clarify the role of design as cultural infrastructure and as a practice capable of sustaining relational and situated forms of

innovation over time.

4. Beyond Solutionism: Design as Relational Process

Critiquing solutionism in design does not imply rejecting the operational dimension of projects, nor questioning the importance of technology in innovation processes. Rather, it calls for situating design action within a broader epistemic and temporal horizon—one that accounts for the cultural, social, and ecological implications accompanying every intervention. In this sense, solutionism is not merely an operational stance, but a cognitive paradigm that frames design as a technical response to isolable and governable problems. As Tony Fry argues, this orientation privileges a short-term temporality focused on immediate efficiency, obscuring long-term consequences and weakening design's responsibility toward possible futures [2]. Similarly, Arturo Escobar highlights how solution-oriented and technocratic approaches risk imposing universalizing models on culturally plural contexts, reducing territorial complexity to standardized, transferable solutions [5].

Today, this orientation is reinforced by digital and computational technologies often framed as inherently problem-solving tools capable of optimizing processes and automating decisions through abstract models. While such technologies offer significant potential, their deployment within rigidly solutionist paradigms can translate contextual complexity into datasets, indicators, and measurable parameters, subordinating social and ecological relations to logics of efficiency and control. For example, when a territory becomes “governable” through dashboards, predictive models, and performance metrics, what resists computation—latent conflicts, informal practices, embodied memories—tends to slip outside the project frame, even though it continues to shape the life of the context.

The critique of solutionism, therefore does not target technology itself, but the manner in which it is integrated into design processes without sufficient reflection on its relational and infrastructural implications. Technologies are never neutral: they actively participate in configuring contexts, relations, and forms of knowledge. Design, in this perspective, becomes a relational and socio-technical process capable of mediating between heterogeneous knowledge, local practices, and technological systems.

John Thackara similarly argues that isolated technological fixes often obscure the systemic dynamics from which problems emerge, advocating instead for design approaches grounded in local ecologies, everyday practices, and long-term living systems [6].

This position resonates with Bowker and Star's insight that infrastructures and classification systems are not merely technical arrangements but devices that shape what becomes visible, actionable, and legitimate within a given context [7]. Technologies employed in design—digital platforms, sensing systems, data visualization tools—structure possibilities for participation and knowledge production. Depending on project posture, they can reinforce extractive and centralized models or operate as mediating tools that support attention and dialogue. Keller Easterling further emphasizes that design frequently operates at an infrastructural level, organizing conditions and protocols rather than producing isolated objects [8]. In this view, technologies are not autonomous solutions but negotiable components embedded within relational networks that unfold over time and across scales. To rethink design beyond solutionism thus means recognizing its role in shaping complex socio-technical ecologies, where innovation emerges through sustained interaction among cultural practices, social relations, and technological systems. Within this horizon, the value of design lies less in solving predefined problems and more in constructing conditions of possibility for shared, situated transformation. It is from this position that listening can be introduced as an epistemic and methodological alternative—not as a rejection of technology, but as its critical and responsible integration within complex contexts.

This shift in orientation can be understood as a movement from output-centered and linear design processes toward relational and infrastructural configurations, as illustrated in **Figure 1**.

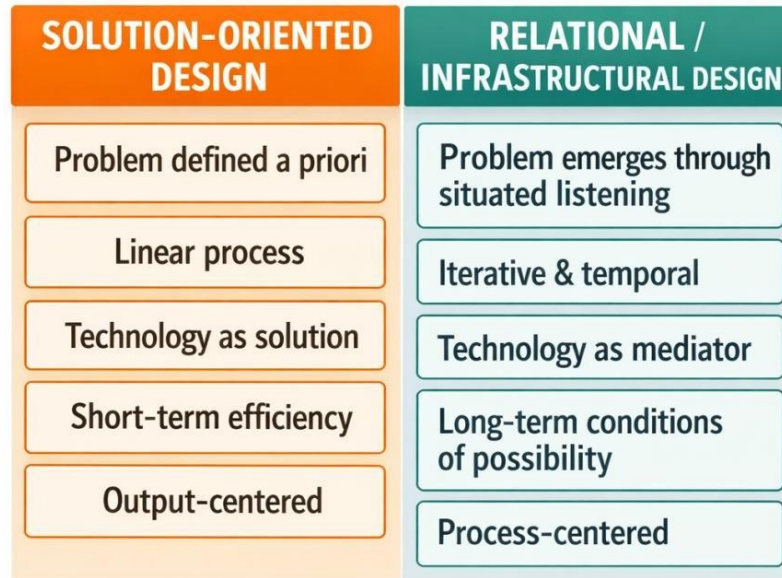


Figure 1. From solution-oriented design to relational and infrastructural design.

5. Listening as Epistemic and Methodological Practice

Within the theoretical repositioning outlined above, listening is proposed as a central epistemic practice for rethinking design in contemporary innovation processes. Rather than functioning as a preliminary analytical phase or a metaphor for attentiveness, listening is understood as situated, embodied, and relational knowledge that shapes how projects engage with contexts, communities, and environments. Listening does not simply gather information; it contributes to constructing the conditions through which knowledge takes form, influencing how issues are recognized, framed, and transformed into design questions.

Steven Feld’s concept of acoustemology provides a key reference point, defining listening as a mode of knowing grounded in sensory experience and environmental relations [9]. In this sense, listening is not merely perceptual reception but a way of world-making through shared practices, memories, and distributed forms of attention. Transposed into design, this implies shifting from the extraction of decontextualized data toward processual knowledge in which what matters is not only what is measured, but what is rendered audible—and, therefore discussable and negotiable.

This repositioning challenges the visual dominance of Western modernity. Don Ihde argues that listening enables alternative relations to the world, disrupting epistemologies based on distance and visual control [10]. In design terms, listening introduces proximity and temporality, making it harder to treat context as an external object and easier to recognize it as a relational field in which the project is already implicated.

Listening also foregrounds time. Situated listening requires duration, iteration, and return; it produces knowledge through resonance rather than immediate extraction. Design thus becomes cyclical rather than linear, where listening reshapes problem-framing itself.

At the same time, listening cannot be separated from the technologies that increasingly mediate design practices. Recording devices, environmental sensors, hydrophones, digital platforms, geolocated sound maps, and data visualization tools do not merely collect information; they select, amplify, and make shareable certain phenomena, transforming them into objects of public discussion. In practices of situated listening, for instance, sensors and mapping platforms do not simply register environmental signals—they configure what counts as signal and what remains noise, thereby shaping collective interpretation.

Listening is, therefore inherently socio-technical. Even computational techniques used to detect patterns or

classify events embody epistemic decisions about categorization and relevance. Which phenomena become visible? Which remain marginal? Listening, in this sense, becomes a critical device.

Dylan Robinson reminds us that listening practices are never neutral; they are embedded in power relations and structures of audibility [11]. For design, this raises questions about who defines protocols, who controls platforms, and whose voices are recognized. Listening thus functions as a criterion of design responsibility—not only in terms of functionality, but in terms of participation and agency.

Methodologically, listening extends beyond analysis to shape temporalities and intervention modes. It often implies slowing down design processes, suspending premature solutionism, and creating spaces of attention in which projects can emerge dialogically. Rather than treating design as a linear sequence of predefined stages, listening introduces iterative rhythms, moments of return, and phases of recalibration that allow problems themselves to evolve. In this sense, listening does not simply precede intervention; it accompanies and continually reorients it.

Such an approach foregrounds the relational density of contexts, acknowledging that territories, communities, and socio-technical systems are not static backgrounds but dynamic assemblages in which design is already implicated. Listening “therefore” modifies the posture of the designer, shifting from control and optimization toward attunement and negotiation. This shift also affects how technologies are deployed: instead of serving exclusively as instruments for measurement and efficiency, they become tools for mediation, translation, and shared interpretation.

Outputs, in this perspective, may consist not only of artifacts but of relational protocols, mediating infrastructures, and durable conditions of exchange. What is produced is often less a finished object than a sustained capacity for interaction, reflexivity, and collective learning. Understood as epistemic and methodological practice, listening provides a foundation for conceiving design as cultural infrastructure—a sustained practice of attention and shared learning rather than a sequence of isolated solutions. As shown in **Figure 2**, listening operates as a mediating device between context, technological systems, and the production of situated knowledge.

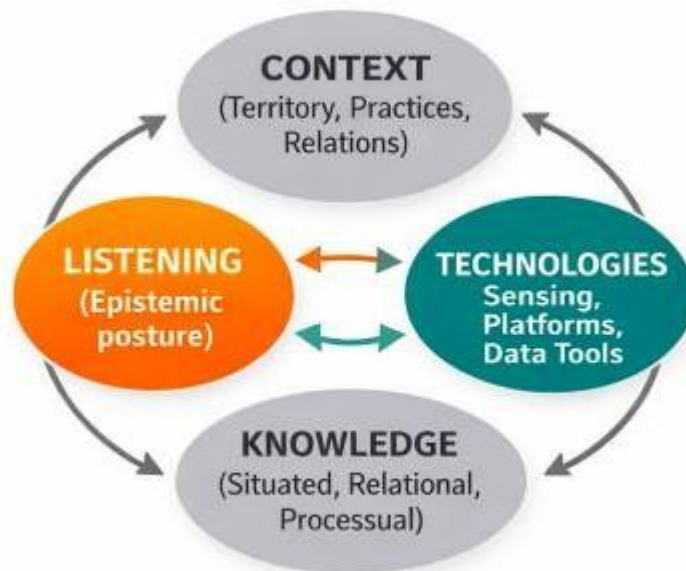


Figure 2. Listening as an epistemic and socio-technical device in design processes.

6. Design as Cultural Infrastructure

The notion of design as cultural infrastructure enables an understanding of how listening-based practices

operate beyond the scale of individual projects. Rather than a punctual intervention or the production of isolated outputs, design becomes a set of conditions, relations, and devices that structure possibilities for action over time.

Following Manuel DeLanda, infrastructure can be conceived as a dynamic assemblage of material, social, and symbolic relations that condition trajectories without determining them linearly [12]. Applied to design, this shifts attention from immediate outcomes to the conditions of possibility that projects help construct and sustain.

In cultural terms, design as infrastructure supports continuity, relationality, and shared learning. Listening practices discussed earlier can be understood as infrastructural components: they may not produce immediately visible results, but they cultivate ecologies of attention, trust, and reciprocity through which innovation becomes relational and situated.

This perspective is particularly relevant in contemporary socio-technical transformations, where infrastructures increasingly take the form of hybrid assemblages integrating digital platforms, governance protocols, data systems, and cultural practices. Design as cultural infrastructure does not oppose technology; rather, it interrogates how technological systems stabilize or transform participation and temporality.

A concrete implication of this view is that output may consist less in a finished artifact and more in a durable protocol—a recurring practice of care, a feedback mechanism, or a minimal exchange platform capable of maintaining relations and learning over time.

This orientation resonates with the work of Ou Ning, whose reflection on rural reconstruction conceives projects not as linear modernization tools but as relational platforms for cultural experimentation [13]. In *Utopia in Practice*, the Bishan Project is described as activating processes of collective learning and engagement that challenge top-down development logics [13].

Similarly, Wang Shu emphasizes non-extractive relations to territory and material tradition [16], framing architecture as mediation between continuity and transformation. From a theoretical standpoint, Yuk Hui’s notion of cosmotechnics questions technological universalism and argues for culturally situated conceptions of technique [14].

Taken together, these perspectives clarify design as a form of cultural infrastructure integrating listening, technology, and context. Innovation, within this framework, emerges not from isolated interventions but from sustained socio-technical ecologies capable of supporting responsible and context-sensitive transformation over time, as schematically illustrated in **Figure 3**.

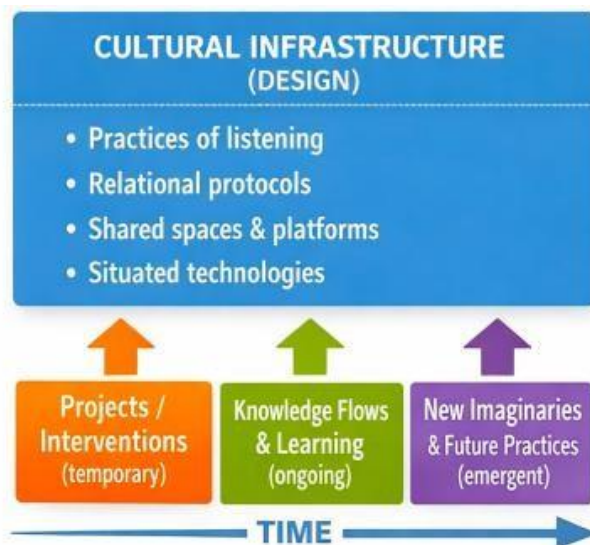


Figure 3. Design as cultural infrastructure sustaining long-term relational processes.

7. Resonances with the Contemporary Chinese Context: Territory, Culture, and Relational Project-Making

The approach developed in this article—understanding design as a cultural, relational, and infrastructural practice—finds a particularly fertile terrain of resonance in contemporary China. This resonance is not merely thematic, but structural, reflecting the correspondence between the proposed framework and the historical, territorial, and cultural conditions within which design is currently called to operate. Over recent decades, China has undergone territorial, social, and ecological transformations of unprecedented scale and speed, prompting a reconsideration of inherited categories of development, modernization, and innovation. In this context, design can no longer be understood as a purely technical tool of optimization or as an interface for technological innovation, but must engage with contextual complexity, layered temporalities, and the long-term consequences of ongoing transformations.

The magnitude of these processes has made it increasingly evident that infrastructures—material, technological, and cultural—are never neutral. They actively participate in redefining relations between territory, communities, and environments. Design thus emerges as a practice capable of acting not only on discrete problems, but on the conditions that make certain development trajectories possible. This implies a redefinition of design's role, from the delivery of punctual solutions to a mediating function able to accompany transformation processes over time.

Within this broader landscape, debates on rurality and non-urban areas have acquired particular prominence. Rural issues are no longer framed solely in terms of productivity or infrastructural deficits, but as cultural and epistemic questions, raising concerns about how territory is known, represented, and transformed. Practices associated with rural reconstruction challenge linear and top-down models of modernization, emphasizing instead the need for approaches capable of engaging with local complexity, sedimented memories, and situated forms of life.

In this context, Ou Ning's work provides a key reference. In *Utopia in Practice: The Bishan Project and Rural Reconstruction*, the project is conceived as a relational platform and a form of cultural infrastructure rather than as a tool for the implementation of predetermined models [13]. The Bishan Project exemplifies a long-term process integrating artistic, cultural, and design practices oriented toward building relationships, sharing knowledge, and experimenting with alternative modes of dwelling and cooperation. In this perspective, design does not introduce external solutions; it creates the conditions through which new practices can emerge through progressive engagement and continuous negotiation of meaning.

These examples are not presented as empirical case studies, but as illustrative configurations that demonstrate how design can operate as cultural infrastructure through long-term relational processes, situated knowledge production, and mediated engagement with territory.

What emerges from these experiences is not a rejection of transformation or technology, but a redefinition of their premises. Innovation is displaced from the logic of rapid and measurable intervention toward relational and temporal processes. In this sense, listening—understood as an epistemic and methodological practice—plays a central role, orienting design not from abstract objectives but from the specific social, environmental, and cultural conditions of contexts, and enabling a critical and situated integration of technologies.

A comparable sensibility can be found in the work of architect Wang Shu, whose approach is grounded in a non-extractive relation to territory and material tradition [16]. Here, architectural design operates as a process of mediation between continuity and transformation, in which materials, techniques, and local knowledge are reactivated within new configurations. Rather than preserving tradition in a static form, this approach demonstrates how design can function as cultural infrastructure, sustaining durable relations between past and present while enabling context-specific forms of innovation.

On the theoretical plane, Yuk Hui's concept of cosmotechnics further clarifies the relevance of a situated approach to design. By questioning technological universalism, Hui argues for culturally specific articulations of technology and innovation [14]. In this perspective, design cannot be reduced to a neutral application of global tools, but must be understood as a practice that mediates between technology, ethics, and worldviews. Listening becomes, in this sense, a crucial epistemic practice for engaging with difference and resisting the imposition of abstract and universal models.

A further level of convergence concerns the role of artistic and cultural practices in shaping territorial imaginaries and renegotiating relations between space, memory, and identity. As Wu Hung observes, contemporary Chinese art often operates in an intermediate space between institutions, communities, and territories, exceeding the production of finite objects and contributing instead to making transformations visible and discussable [15]. These practices act as infrastructural devices that enable new forms of awareness, participation, and collective reflection.

Within this framework, design as cultural infrastructure is continuous with these practices in its focus on processes, relations, and temporalities. Rather than producing isolated outputs, it contributes to constructing conditions for dialogue, participation, and shared learning. It operates as a mediating device among diverse actors—institutions, communities, technologies, and situated knowledge—helping to structure environments in which territorial transformations can be understood and, potentially, reoriented.

In light of these considerations, the framework proposed here is not intended as an external model to be applied to China, but as a space of resonance and dialogue with practices already active within the Chinese context. Listening emerges as a shared epistemic ground through which different traditions and approaches can interact, enabling design to operate as a situated, relational, and open practice capable of accompanying complex and non-linear transformation processes over time.

8. Implications for Design Research and Education

Adopting an approach to design grounded in listening and in its infrastructural dimension entails substantial implications for both design research and design education, challenging consolidated modes of producing, evaluating, and transmitting knowledge. First, this perspective requires a critical revision of the criteria through which design research is legitimized within academic contexts. If the value of design is measured primarily in terms of outputs, implementable solutions, or immediately applicable technological innovation, practices operating at the level of processes, relations, and long-term transformations risk remaining marginal. A listening-based approach instead requires recognizing situated and processual forms of knowledge that do not always yield immediately quantifiable outcomes, yet are decisive for understanding and accompanying complex, unstable, and culturally differentiated contexts.

From this viewpoint, design research no longer appears as an activity oriented exclusively toward solving predefined problems, but as a process of exploration and of constructing conditions of possibility. As Ezio Manzini notes, contemporary design increasingly operates as enabling infrastructure, supporting collaborative processes, distributed learning, and innovation dynamics that emerge over time [4]. This implies that design research should be evaluated not only for its final results, but also for its capacity to activate relations, produce shared knowledge, and generate durable effects in the contexts where it operates.

Methodologically, this shift broadens the tools and languages of design research. Listening practices—understood both literally as attention to sonic, environmental, and material contexts, and more broadly as an epistemic openness to knowledge, experiences, and relations—can be integrated into research processes as full-fledged knowledge devices. They enable the coexistence of analytical and data-driven methodologies with qualitative, ethnographic, and participatory forms of inquiry capable of capturing dimensions that elude purely

quantitative or computational models. Within this framework, digital technologies—from sensing systems to visualization and simulation platforms—can be rethought not as instruments of control or mere data extraction, but as epistemic mediators that help make complex dynamics perceivable, shareable, and discussible.

The implications of this approach are especially significant in education. Training designers capable of operating in complex contexts means moving beyond an education focused only on technical skills or the effective use of technological tools. Integrating listening as a method entails cultivating relational, cultural, and ethical competencies enabling designers to engage responsibly and situationally with communities, territories, and socio-technical systems. This does not diminish the role of technology in design education, but critically relocates it: technologies are understood as elements within broader design ecologies to be questioned, negotiated, and adapted to contexts, rather than as neutral or universally valid solutions.

In this sense, design education can be reimagined as a space for infrastructural experimentation, in which students and researchers learn to work with long-term processes, confront uncertainty, and recognize attention and care as design resources. Listening practices foster learning that does not merely aim at problem-solving but develops the ability to read contexts, recognize asymmetries and differences, and build durable relations among knowledge, technologies, and territories.

Finally, adopting an infrastructural and relational perspective on design implies redefining the role of the university as a cultural actor within innovation processes. Design research and teaching can contribute not only to producing specialized knowledge but to building platforms for dialogue among disciplines, institutions, and communities. Here, Yuk Hui's reflections are particularly relevant: conceiving technology as a culturally situated practice implies a design education capable of critically interrogating the premises of technological innovation, orienting design toward forms of development more attentive to contexts, temporalities, and the cultural implications of contemporary transformations [14].

9. Conclusions

This article has proposed a rereading of design as a cultural, relational, and infrastructural practice, articulated through the notion of listening, understood both as an epistemic posture and as a design method. Starting from a critique of solution-oriented and technocratic paradigms of innovation, the contribution has shown how design can be rethought not only as the production of solutions or measurable outputs, but as a process capable of configuring relations, temporalities, and conditions of possibility over the long term [2,5]. The main theoretical contribution of this article lies in articulating a framework that positions listening as a central epistemic and methodological device through which design can be understood as cultural infrastructure. In a global context marked by profound social, territorial, and ecological transformations, such a shift in perspective appears not only desirable but necessary.

To rethink design as cultural infrastructure means recognizing its role in constructing complex socio-technical ecologies within which technologies, knowledge, and cultural practices interact in non-linear ways [7,8,12]. In this framework, listening plays a central role: it enables projects to be oriented from the specific conditions of contexts, avoiding the imposition of abstract or universalizing models and fostering instead forms of situated, relational, and responsible innovation[9-11]. Listening is not treated here as a preliminary step or a mere tool for gathering information, but as an ongoing practice accompanying design over time, shaping modes of intervention, priorities, and ethical implications[9-11].

This perspective resonates with John Thackara's work, which argues that contemporary design's task is not to produce new solutions, but to change how we live—working with local systems, everyday practices, and ecological relations over the long term [6]. In his theoretical contributions and experiences also developed in China, Thackara shows how innovation emerges from attention to real contexts, listening to communities, and the ability

to operate through light infrastructures—often invisible—that sustain life over time [6]. This view reinforces design as an infrastructural practice oriented not to immediate problem-solving, but to building conditions that support coexistence, resilience, and shared transformation.

Dialogue with contemporary China has highlighted that this orientation is not an external framework applied after the fact, but one that resonates with existing practices and debates[13-16]. Rural reconstruction experiences, reflections on situated technology, and the role of artistic practices in producing new territorial imaginaries show how design can operate as a relational platform and cultural infrastructure, capable of accompanying complex transformation processes, avoiding prescriptive approaches and valuing instead plural contexts, temporalities, and future visions[13-16].

From the perspective of design research and education, the implications are substantial. Recognizing the epistemic value of processes, relations, and listening practices requires revising how design research is evaluated and redefining educational goals[4,9,10,11]. Design education can thus become a space for infrastructural experimentation oriented not only toward technical competence but toward the development of critical, relational, and ethical capacities required to operate within complex socio-technical contexts[4,14]. Technologies are not rejected, but critically relocated within broader design ecologies whose roles and implications are constantly interrogated [14].

This study is primarily conceptual and does not rely on systematic empirical case studies. Future research could apply this framework to specific design contexts in order to test its analytical and operational potential. Further investigations may explore how listening-based design practices can be operationalized within specific socio-technical environments, particularly in relation to digital infrastructures, territorial transformation, and participatory processes.

In conclusion, this contribution does not propose a new normative model of design nor a universally applicable methodology. Rather, it offers an open theoretical and methodological orientation that understands design as a situated practice and cultural infrastructure capable of sustaining transformation processes over time [12]. Listening, as both method and epistemic posture, emerges as a key element for rethinking innovation beyond the logic of solution, opening space for forms of project-making more attentive to contexts, relations, and possible futures[9-11]. In this sense, design can contribute not only to addressing present challenges, but to building conditions of possibility for imagining and inhabiting forthcoming transformations more responsibly.

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