

Design and Missing Data

Typologies of Absence and Epistemic Justice

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Abstract

This curatorial introduction explores the politics of absence in digital knowledge systems, focusing on how design can critically engage with and respond to the condition of 'missing data'. Absence is understood not as a technical gap but as the product of sociohistorical and institutional forces, with profound implications for epistemic justice and cultural representation. This issue foregrounds practices that question dominant data paradigms and reflect specifically on the role of design in engaging with data as a contested domain that demands participatory and critical approaches. From alternative data infrastructures to participatory inquiry and experimental ways of visualizing, collecting, and archiving, this editorial for the current Open Debate section is interested in how design can become more attentive to its relationship with data, to the politics of datafication, and to the need to reimagine other ways of engaging with data through design.

Keywords

Missing data
Design and data justice
Counterdata practices

Introduction

In this issue, we reflect on the politics of absence within digital knowledge systems — on what is omitted, silenced, or rendered invisible through processes of categorization, automation, and archiving. We use the term digital knowledge systems to refer to the sociotechnical infrastructures, digital platforms, databases, archives, and algorithmic tools, through which knowledge is produced, organized, and legitimized¹. This article is conceived as a curatorial introduction to the Open Debate section of *diid*, rather than as a conventional empirical research paper. Its role is to frame the conceptual and methodological terrain of the issue and to orient the reader through the constellation of contributions that follow.

In an era increasingly shaped by datafication the data that we collect, analyze, and share determine what truly matters. Who gets to decide and shape what is worth collecting, preserving, or making visible? And how is design involved in these practices of making data visible or neglected?

We approach these questions with a specific focus on design as a critical practice — one that can expose the epistemic and political conditions behind ‘missing data’. Absence is both political and cultural: political because it reflects power relations embedded in data infrastructures, and cultural because it often erases intangible, everyday cultural expressions, community practices, and minoritized narratives. The contributions in this issue show how design can expose such absences and imagine alternative ways of engaging with them.

This Open Debate builds on previous work by the two editors. First, it draws on the doctoral research of Simona Colitti, who over three years investigated the relationship between design practices, data, and cultural heritage. As part of this work, she highlighted how digitization processes often generate ‘missing data’, raising questions about exclusion, standardization, and invisibility (Colitti et al., 2025). Building on this perspective, the research project explores the implications of heritage digitization and positions design as a practice of co-creation and digital awareness — one that fosters more inclusive representations while encouraging analytical reflection on what is digitized, for what purposes, by whom, and on whose behalf. This perspective opens a broader reflection on the tension between technical standards and the need to produce context-attentive, culturally meaningful representations of heritage.

Second, it draws on Paola Pierri’s interest and research into the different ways in which design practices engage with data — both as an input to the design process and as an output or ‘object’ of design. Her interest in studying data began in 2015, when she became an “accidental ethnographer of data” (Douglas-Jones et al., 2021, p. 12) and learned about the centrality of data politics, while conducting research in mental health services digitalization practices. In her most recent work (Pierri, 2024) she highlighted the need for design to begin discussing and engaging with alternative understandings of data — as plural and as a terrain of struggles for justice — questioning what data are and what design can do with, for, or through data, including in design education (de Götzen et al., 2018).

¹
As Loukissas (2019) argues, data should be understood as ‘local,’ always plural, situated, and shaped by the contexts and practices through which they are produced. Following this perspective, in this paper we use *data* in the plural form to emphasize their situated and heterogeneous nature.

This issue foregrounds practices that question dominant data paradigms and reflect specifically on the role of design in engaging with data as a contested domain that demands participatory and analytical approaches. From alternative data infrastructures to participatory inquiry and experimental ways of visualizing, collecting, and archiving, we are interested in how design can become more attentive to its relationship with data, to the politics of datafication, and to the need to reimagine other ways of dealing with data by design. In this context, large-scale digitization initiatives such as Europeana², and the growing development of digital twins for cultural heritage, exemplify both the opportunities and the critical challenges of data-driven representation. By highlighting practices grounded in justice, democratic principles, situated knowledge, and collective meaning-making, we aim to expose what risks disappearing within the folds of digital infrastructures.

²
Europeana is the main European platform for cultural heritage digitization (<https://www.europeana.eu>).

In the following sections, the paper first introduces and defines the concept of ‘missing data’, proposing a typology of modes of absence. This typology represents our main contribution to the Open Debate section, and it is central to our paper’s main purpose: to advance an understanding of typologies of absence as being central to frame ‘missing data’ as a material of design. The paper then reflects on the different ways in which design practice addresses the question of ‘missing data’ and introduces the issue’s contributions. In the conclusion, we advance the understanding of designing with absence as a situated and critical practice that reframes absence in its complexity — as a productive condition and a material for design inquiry. The contribution of this article lies in introducing a typology of absence within digital knowledge systems as an analytical and operational framework. This typology is designed to support designers and researchers in recognizing how different forms of absence are produced and in orienting context-sensitive design engagement with ‘missing data’.

Accounting for Absence

In contemporary digital contexts — shaped by processes of automation, quantification, and algorithmic governance — knowledge production is deeply entangled with the infrastructures that mediate it (Floridi, 2014; Mattern, 2017). What remains unrecorded, untracked, or unarchived can carry as much epistemic and political weight as what is made visible (D’Ignazio & Klein, 2020). Absence, in this framework, is not a technical failure to be corrected but a condition produced by sociohistorical and institutional forces (Fricker, 2007). In these contexts, certain data (and therefore certain groups of people to whom the data belong, and the phenomena the data should capture) are deliberately made to disappear. Scholars who have paid attention to the ‘missing data’ describe the emerging phenomenon of “data poverty” (Milan & Treré, 2020) as a novel form of invisibility that perpetuates and creates new forms of inequality through the politics of data.

As data systems multiply and automated infrastructures increasingly influence how knowledge is produced, distributed,

and legitimized, a central question emerges: What is absent — and why? This Open Debate section of *diid* investigates the politics of absence in digital knowledge systems, emphasizing the epistemological, structural, and cultural mechanisms through which absence is constructed, negotiated, and deployed. It specifically explores the role of design in shaping, challenging, or reinforcing these mechanisms — interrogating how design practices and understandings of data contribute to the conditions under which certain experiences, bodies, or knowledges are rendered invisible, excluded, or systematically ignored.

In this Open Debate we understand and frame ‘missing data’ as the different kinds of data (not only digital or numerical data) that are (a) not collected; (b) not or slowly digitalized; (c) not analyzed; (d) not used; or (e) used in proprietary ways (e.g., not shared). The overarching concept of ‘missing’ is therefore an umbrella term that includes varieties of absence. As D’Ignazio (2024) reminds us, ‘missing data’ are those neglected, deprioritized, uncollected, unmaintained, or unpublished by institutions — even when politically requested by specific groups. In this sense, ‘missing data’ are embedded in local knowledge practices, relational, and political, highlighting that absence is never neutral but always the result of choices and power dynamics.

The most obvious instance of ‘missing data’ is data that are not collected. This category itself includes a variety of data that might not be collected for different reasons (some of which are referred to in our typology of ‘missing data’ that we present below; see [Tab. 1](#)), including data that cannot be collected, data that are not considered worth collecting, and data that are censored or locked in proprietary arrangements. Additionally, data might not be collected due to a lack of tools to do so. However, ‘missing data’ also includes the data that are only available in non-digital formats and therefore cannot be read and used by machines or indexed and archived digitally — thus contributing to the generation of biased datasets. This points to the slow and uneven processes of digitalization, where archival practices, resource constraints, and curatorial decisions determine which records become accessible and which remain invisible. While digital archives promise wider access, they also risk reproducing exclusions by prioritizing certain collections over others, thereby shaping whose histories and memories are preserved.

Data that are collected and made digitally available might still be missing in the sense of not being analyzed or interpreted — they exist, but no one looks at them. This kind of absence concerns who has the responsibility, the skills, and the authority to analyze data, and whose perspectives are included or excluded in the process of interpretation. A different form of absence emerges when data are analyzed but not used to inform planning, design, or policy decisions. Here, data may circulate, yet without generating participation or collective agency in the processes that affect communities. This aligns with a recent study (Ponti et al., 2024) that underscores the importance of moving from a focus on data availability to ensuring that data are used in ways that favor participation and agency. Data are also missing when locked in private corporations and used only in proprietary ways — to benefit the few rather than serve the public good.

Addressing ‘missing data’ is even more crucial as algorithms and platforms increasingly shape everyday life through systems of classification, recommendation, and prediction that rely on partial datasets. When voices, practices, and communities are absent, invisibility becomes entrenched, and inequality is reproduced. This applies across many domains, including healthcare, education, climate research, and the field of cultural heritage. Large digitization projects in the heritage sector illustrate this particularly well: if local communities and minority groups are not actively involved in deciding what and how to digitize, archives risk reflecting dominant perspectives alone and diminishing cultural pluralism. Without the participation of local collectives and civil society groups, it is difficult to build a digital world that is not only technologically advanced but also just and representative. This issue is also directly linked to self-determination. The ability of peoples and communities to decide what counts as knowledge — and how that knowledge is preserved or made visible — is an essential dimension of epistemic justice (Fricker, 2007). ‘Missing data’ therefore point to questions that exceed technical infrastructures and speak to cultural autonomy and the politics of recognition.

As D’Ignazio (2024) suggests, defining something as missing is never neutral; it expresses a normative stance — a sense that something is absent but ought to be present. Therefore, addressing the question of what data are missing becomes crucial in our ‘datafied’ society, as key decisions — such as new policies, economic plans, healthcare interventions, etc. — are made based on the data that are available. Although we take a critical stance toward instances of ‘data fundamentalism’ (Crawford, 2013) and recognize that what counts might not always — and not only — be translated into data, we do acknowledge the profound impact that ‘missing data’ can have on people’s lives: from shaping how people are portrayed, to determining the services they can access (or not), and the things that are remembered (or not), etc.

While specific forms of absence may stem from technical constraints or procedural limitations, this issue foregrounds the systemic — rather than incidental — nature of ‘missing data’. Moving beyond assumptions of data as neutral or complete, even so-called ‘raw’ data are never free from bias, since every result depends on choices of collection, classification, cleaning, and interpretation. Contributors embrace a view in which absence is symptomatic of broader power asymmetries. Absence becomes an artefact of epistemic injustice, epistemic violence, and strategic omission. As Loukissas (2019) reminds us, datasets are always shaped by contradictions and institutional priorities, which make absence a manifestation of epistemic hierarchies rather than a neutral gap.

This Open Debate aims to initiate a conversation among design scholars and practitioners on the need to expand the repertoire of practices and methods that design can use to engage with data differently. While more design researchers are becoming aware of the complexities of engaging with data, the discipline still seems to suffer from what has been defined as a form of conceptual dissonance: “Where one knows conceptually that data are interpretively fluid and yet acts as if it were, might be, or should be objective and universal” (Feinberg, 2017, p. 2).

In this issue, design is not approached solely as a technical endeavor. It is introduced as a situated and reflective practice of inquiry, in conversation with what has been described as frictional or critical design (Benedetti & Mauri, 2023). Within this perspective, design serves as a way of making visible the political implications of absence, while simultaneously opening space for collective, context-sensitive forms of knowledge production. Universalist data frameworks that flatten cultural difference, and machine learning systems trained on skewed datasets, exemplify how design and classification logics can contribute to obscuring marginalized voices (Costanza-Chock, 2020; Criado-Perez, 2019). The contributions in this issue of *diid* explore — with theory and practical examples — whether and how design can emerge as a practice for engaging with what is missing, through different approaches:

- 1 Inclusive and participatory visual methodologies that mediate between individuals with different levels of expertise and incorporate, by design, multiple ways of perceiving the same phenomenon, making the non-neutrality of data explicit (as in Ascari and Ricci's contribution).
- 2 Counterdata practices that enhance digital sovereignty not only at the national but also at the community level, addressing the political dimensions of absence and representation (as in Frischknecht's paper).
- 3 Restorative and transformative approaches to data science, which mobilize design as a practice of care, repair, and collective justice, reimagining absence as a generative condition (as discussed in the interview with Catherine D'Ignazio).
- 4 Visual and data storytelling as acts of resistance and documentation, using design to expose systemic violence and reclaim the right to narrate and visualize from within marginalized communities (as in Visualizing Palestine's contribution in the visual essay).

In this section, we have explored the concept of 'missing' in its complexity — as an umbrella term that encompasses various types of data that are absent in different ways and for a variety of reasons. This implies that design must engage critically with 'missing data' by understanding and responding to the different conditions of 'absence'.

Typologies of Missing

To better understand and examine the concept of 'missing data' and reflect on possible roles for design in addressing different instances of absence (e.g., when data are not collected, are locked, or are misused/non-used), we propose a typological analysis of the various causes of 'missing data'.

We have organized the typologies according to two main dimensions: epistemological and infrastructural Fig. 1.

Within this framework, the epistemic dimension foregrounds questions of knowledge, classification, and recognition, while the infrastructural dimension draws attention to the material and political mechanisms through which absence is produced.

Analytical Framework for Typologies of Data Absence

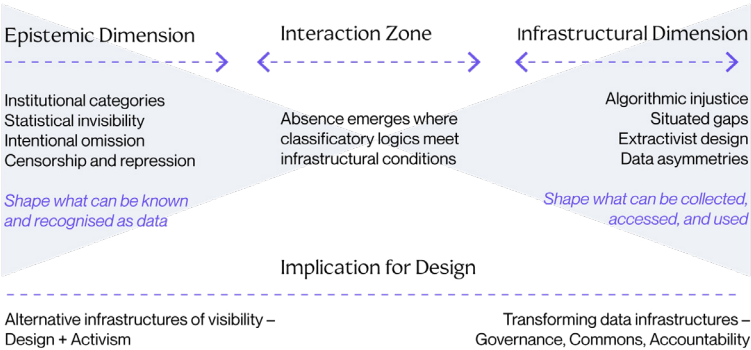


Fig. 1
Analytical framework for typologies of data absence. Authors' elaboration.

Category	Characteristics/Description
Institutional/Law	Data are not collected or made available due to institutional practices, such as the lack of legal recognition of specific groups and institutionalized forms of sexism, racism, and classism.
Statistical Invisibility	Institutional and legal forms of absence shape the datasets and records that are available, for example, the lack of non-binary gender options or the absence of disaggregated data. Statistical records — what is collected, organized and archived — can generate forms of invisibility of certain groups and phenomena, such as trans and queer people, indigenous groups, and migrants.
Intentional Omission	The absence of data on sensitive or marginalized domains, such as domestic work, abortion, and gender-based violence, reflects political strategies of silence, control, or resistance.
Censorship and Repression	This typology of absence refers to the temporary or sudden deletion, blocking, or obfuscation of existing evidence and datasets, for instance, in authoritarian contexts or conflict zones.
Algorithmic Injustice	Predictive bias, discriminatory metrics, and distorted outputs are reinforced by underrepresentation or misrepresentation of certain data in training datasets.
Situated Gaps	Data may be missing as a result of physical or digital infrastructural gaps, blind standardization, territorial exclusion, or the uneven distribution (or complete lack) of resources needed to develop and maintain datasets in certain geographical areas or among specific groups.
Extractivist Design	Data may also be missing as a result of exclusion from co-design processes and the lack of participation by certain groups. This can lead to skewed, top-down, and technocratic processes. As Costanza-Chock (2020) observes, design processes that do not include marginalized communities tend to reproduce structural inequalities rather than challenge them.
Data Asymmetries	In platform capitalism, corporations accumulate massive data reserves as competitive assets, reinforcing asymmetries of power. Data is increasingly enclosed in private silos and retained as proprietary capital, a form of data hoarding that allows platforms to consolidate control over what can be known and by whom.

Tab. I
Categories and causes of 'missing data'. Authors' elaboration.

The epistemic question is central in discourses on ‘missing data’ and constitutes one of the core dimensions of the proposed typology. The infrastructural dimension, in turn, foregrounds the material and political mechanisms through which absence is produced. Here, ‘missing data’ emerge through algorithmic bias, gaps in standards and resources, extractive design practices, censorship, or privatization. These forms highlight how infrastructures, governance regimes, and data economies actively shape what can be collected, accessed, or made visible. This distinction allows us to interpret absence both as a matter of epistemic injustice and as an outcome of sociotechnical arrangements. The typology presented in [Tab. I](#) organises these categories, outlining their main characteristics and providing a brief description of absence, along with the key references on which the categorization is based.

To the table, we propose adding the novel category of *Missing Data as a Political Force* (introduced by Frischknecht in this Open Debate), which interestingly describes absence as an active political condition that can expose and resist power structures. In this context, ‘missing data’ reveal inequalities and can be mobilized through counterdata practices to reclaim visibility and digital sovereignty.

The typologies presented in [Tab. I](#) should not be read as a static inventory, but rather as an analytical tool that reveals the multiple ways in which data absence is produced and sustained. The categories outlined in the first part of the table — epistemic in nature — demonstrate that ‘missing data’ are not the result of technical accidents, but rather the outcome of classificatory systems that actively exclude certain subjects or social practices. Institutional invisibility, statistical erasure, and intentional omission express cultural and political logics that define what is considered worthy of being recorded and what is relegated to silence. In this sense, absences become an integral part of a knowledge regime that not only reflects but also reproduces inequalities.

The infrastructural categories, by contrast, highlight the material and technological mechanisms through which absence becomes consolidated. Phenomena such as algorithmic bias, situated gaps, extractivist design processes, or asymmetries generated by the hoarding of data by private actors demonstrate that accessibility and visibility are not neutral properties, but outcomes of specific sociotechnical configurations. In this context, absence does not stem solely from classificatory decisions; rather, it is produced through imposed standards, proprietary regimes, and market dynamics that determine who can collect, manage, and use data. These two dimensions, however, should not be considered in isolation. The epistemic and the infrastructural are mutually reinforcing: classificatory systems that ignore certain identities often translate into technological infrastructures that further render them invisible, while exclusionary infrastructures may, in turn, produce new forms of epistemic erasure. The typology thus functions as a framework to foreground these interdependencies and to create space for critical interventions.

For design research, recognizing the diverse conditions that contribute to ‘missing data’ requires taking a critical and adaptable role in constructing alternatives tailored to specific typologies of absence. A deep investigation into the various forms of absence should guide design practices that aim to challenge the politics of invisibility, support countermapping approaches, and imagine infrastructures grounded

in principles of equity, care, and accountability. In this sense, design is not merely a representational tool, but a political practice capable of transforming the very conditions under which data are produced and circulated. In the following section, we discuss design projects and other initiatives that have attempted to respond to these categories of 'missing data', offering situated strategies of intervention.

Methodological Note

The typology of 'missing data' presented in this section emerged through an iterative process that combined conceptual review, comparative analysis, and context-sensitive interpretation. The methodological orientation aligns with design research approaches that understand cases as sociomaterial configurations shaped by practices, infrastructures, and institutional arrangements (Binder et al., 2011).

The development of the typology drew on a body of materials accumulated over time through our research activities and the projects we have engaged with, together with the contributions included in this Open Debate. These materials do not constitute a formal empirical study nor a systematically collected dataset; rather, they represent a set of documented cases that offered significant insights into how different forms of absence are produced or made visible across diverse design and cultural contexts.

The organisation of these cases followed a purposive logic, consistent with qualitative case-study traditions (Yin, 2014). We selected examples that explicitly address the question of 'missing data' and that provide sufficient documentation to support meaningful comparison. Through this comparative reading, recurring mechanisms of absence became visible and could be articulated into broader epistemic and infrastructural dimensions. This distinction was not defined in advance but developed progressively through the interplay between theoretical perspectives and the cases examined.

The typology should therefore be understood not as a definitive classificatory device, but as an analytic and generative framework. Its aim is to support designers and researchers in recognising the mechanisms that shape absence in specific contexts and to guide reflection on how different forms of invisibility may invite distinct modes of engagement. Rather than prescribing solutions, the typology emphasises the importance of situating any design response within the social, political, and infrastructural conditions that produce absence.

Addressing Absence Through Design: Practices and Perspectives

In this section, we aim to articulate a role for design in addressing the question of absence in data work as a situated and critical practice — one that can evolve and take on different and bespoke roles to engage with various typologies of absence. We first propose an understanding of data (and their absence) as a design material, drawing on design and anthropological accounts.

Section *Attuning Our Strategies to Address Absence* then illustrates, through practical examples, how design can be used to address specific modes of absence. We then bring forward our argument that in order to identify and situate design interventions that are appropriate and tailored to the multiplicity of modes of absence, a more nuanced understanding of typologies of missing is necessary that distinguishes between epistemic and infrastructural forms of invisibility.

Data as Design Material

This Open Debate proposes a shift in perspectives on how we frame the role of design and its relationship with data, suggesting that ‘missing data’ can be understood as a critical and situated design material. Thinking about data in design through a ‘material lens’ (Pierri, 2024; Lee-Smith et al., 2023; Bates et al., 2016) calls for greater depth in how designers understand and use data. From data understood as an input or output of the design process, to a more holistic engagement with the entire data cycle — from extraction to production and manipulation, to use and reuse. A material lens on data can help disambiguate the many ways in which the term ‘data’ — and ‘missing data’ — is used, by requiring specificity in the definition of data, the typology of absence, and their categorization. This material lens can be provided by integrating design with recent anthropological accounts, which emphasize the material specificity of data (Douglas-Jones et al., 2021). Following Poirier (2022), “Anthropological attention to the materialities and mutability of data-producing technologies, along with the culture and politics that shape them, can help to unpack how expertise operates, how knowledge is legitimised” (p. 277).

A growing body of design research further reinforces this material perspective by showing how designers actively work with data throughout the inquiry process. Kun’s account of *Design Inquiry Through Data* (2020) shows how data become operative within design as materials that are collected, reorganized, and iteratively transformed to frame problems and articulate situated insights. This perspective aligns with the ablative framework proposed by Speed and Oberlander (2016), which describes how the relationship between design and data has shifted from designing *from* data, to designing *with* data, and, in some cases, to designing *by* data. Their model highlights how data acquire different forms of value — technical, social, and ethical — and how designers must work with data not as static inputs, but as dynamic, mutable elements embedded in ongoing processes. While the *from* mode situates data as evidence supporting traditional design practice, the *with* mode emphasises engagement with continuous data streams that require new interpretive and technical capacities. The *by* mode points to emerging situations in which algorithmic systems autonomously generate design outcomes, positioning data as active agents rather than mere resources. Taken together, Kun’s analysis and the ablative framework underscore the material and operational complexity of data in contemporary design practice, and reinforce the need to understand how designers shape and are shaped by the data they mobilise.

What both approaches — design and anthropology — have in common is the invitation to attune ourselves to the geographic, cultural, and temporal dimensions of data, beyond abstract and universal claims, and to engage with the lived experiences of those affected by data politics and practices (Albury et al., 2021). These situated approaches still acknowledge and appreciate how data are mobilized across translocal contexts. In *Counting Feminicide* (D'Ignazio, 2024), the author clearly illustrates how translocality can take shape, for instance, through the community-driven research-action project *Data Against Feminicide*, which fostered new South–North collaborations. Such approaches seek to build feminist and anti-racist bridges across countries, enabling locally grounded data practices to connect, circulate, and scale while still respecting cultural, historical, and geographic specificities.

These shifts invite us to frame data as produced and consumed differently by different communities and in different contexts (Poirier, 2022); and to reconsider the fact that people do not only and always passively experience data — they also actively develop mechanisms to cope with, resist, and better control data, including ‘missing data.’ This is again well exemplified in the *Data Against Feminicide* project³, where the women involved not only processed traumatic materials and testimonies to ensure that they were archived with dignity and without reproducing harm, but also sustained trustful relationships with affected communities. Such practices also involve intense emotional labor, which is required to make data work a practice ‘of care’. These approaches illustrate a possible role for design, which is attentive to the affective burdens of data collection, committed to collective well-being, and oriented toward justice rather than neutrality.

Drawing on the notion of data settings as defined by Loukissas (2019) — developed in opposition to the neutral notion of data ‘sets’ — we recognize that data are inseparable from the socio-technical and institutional infrastructures that produce them. They are always embedded in specific local contexts that shape their form, meaning, and visibility. This position is consistent with Haraway’s notion of “situated knowledges” (Haraway, 1988), which rejects the fantasy of a neutral “view from nowhere” and calls for an explicit recognition of the positionalities that define what can — and cannot — emerge as data. The concept of “local contingency” (Crowder et al., 2020; Loukissas, 2019) further reinforces this perspective by highlighting how every dataset reflects historical, geographic, and technological constraints. What becomes present in data — and what is omitted — reveals as much about underlying power structures and cultural values as it does about the phenomena being measured.

In this light, data visualization becomes more than an act of rendering; it is a form of context-sensitive reading, grounded in specific socio-material conditions. It enables designers to question the narratives embedded in data, to identify silences, and to reflect critically on what remains unseen. This process opens new possibilities for design, not only as a representational practice, but as an engaged, reflexive method of situated knowledge production.

³
Data Against Feminicide, participatory research-action project on feminicide data, <https://datoscontrafeminicidio.net/en/home/https://datoscontrafeminicidio.net/en/home/>.

Drawing on our typology of ‘missing data’, in this Open Debate we put forward the idea of using design specifically to address distinct modes of absence. By distinguishing between epistemic and infrastructural forms of invisibility, it becomes possible to situate design interventions within a broader analytic framework that traces a methodological progression. This movement from categorization to practice shows how absence is not only a conceptual problem but also a practical and methodological challenge for design, demanding situated counterstrategies.

Some of these practical and context-sensitive counterstrategies are illustrated in this Open Debate through the contributions we have collected. In this section, we focus on additional examples examined through a small comparative case review. The selection followed an exploratory, purposive logic, privileging cases that explicitly engage with forms of ‘missing data’ across different domains. The analysis relied on a light interpretive reading inspired by design-oriented approaches that treat cases as sociomaterial ‘things’ shaped by practices, infrastructures, and relations. This allowed us to identify recurring patterns and map each initiative against the categories in [Tab. 1](#), not to define best practices, but to demonstrate the analytical value of the typology and how it can inform context-sensitive design counterstrategies.

Within the epistemic categories, absence emerges through institutional neglect, classificatory regimes, and political silences. Responses in this domain often rely on creating alternative infrastructures of visibility, where design is interwoven with activism and community practices. In response to institutional and sociopolitical omissions, feminist initiatives such as *Data Against Feminicide* build independent data infrastructures that foreground gender-based violence, reframing data collection as an act of accountability (D’Ignazio & Klein, 2020).

Similarly, *Queering the Map* redefines mapping as an affective and collective archive of queer experience. Rather than aspiring to statistical accuracy or territorial completeness, the platform enables users to geolocate personal memories and emotions, producing a mosaic of lived narratives that challenge dominant cartographic epistemologies. By foregrounding subjectivity and embodiment, it reclaims the authority to define what counts as data, positioning queer presence itself as a mode of counterdata (LaRochelle, 2017).

Intentional omissions can be addressed through practices of counterdocumentation, where absence is strategically turned into presence by those directly affected. Censorship and repression are challenged through infrastructures such as the *Syrian Archive* (Syrian Archive, n. d.) and the *Internet Shutdown Tracker* (Access Now, 2023), which reconfigure absence into testimony, resisting enforced erasure. In these cases, a possible approach from design lies in counterdocumentation and counterarchiving, where visibility is reclaimed in response to political silencing.

The infrastructural categories foreground the ways in which absence is embedded within standards, systems, and economies.

Initiatives addressing algorithmic injustice — such as the *Algorithmic Justice League* — move beyond correcting biased datasets to politicizing technical infrastructures themselves. Through advocacy, education, and creative intervention, they transform algorithmic critique into a form of public pedagogy and collective awareness (Noble, 2018).

Situated gaps are addressed by localized initiatives such as *Laboratorio Salute Popolare – Social Triage*, a self-organized clinic and observatory in Bologna (Italy)⁴ that produces data from below to expose the structural inequalities of the public healthcare system. By documenting patients' experiences and access barriers, the initiative reframes health data as a matter of social justice and civic accountability, revealing how institutional systems often fail to capture lived conditions of marginalization (Loukissas, 2019).

Extractivist design is challenged through participatory and speculative toolkits that reconfigure the relationship between expertise and collective imagination. Ascari and Ricci's contribution exemplifies this orientation by exploring inclusive and visual methodologies that expose the non-neutrality of data. Similarly, the *Political Imagination Toolkit* (Superr Lab, 2025) reorients design away from technocratic logics toward collaborative, open-ended processes, using speculation as a tool for reappropriating future scenarios and rethinking design agency.

Finally, data asymmetries are confronted by initiatives such as *Immanence – Data Commons and Privacy Network* (n.d.), which experiment with new forms of data stewardship and digital rights advocacy. These projects question the concentration of informational power in private infrastructures, proposing collective and transparent governance models that treat data as a shared resource rather than a proprietary asset. Taken together, these cases illustrate how infrastructural absences can be met through design not by technical correction alone, but by reimagining governance, accountability, and the distribution of knowledge and power.

This methodological progression — from categorization to situated counterstrategy — demonstrates the importance of beginning with an analysis of the reasons for absence, in order to later deploy the most appropriate strategies to address it. The same strategy may not be suitable — or even harmful — for different typologies of 'missing data'. Each category — as illustrated in Tab. I — identifies a distinct mechanism of invisibility, and each practice demonstrates how that invisibility can be contested and reconfigured. Our typologies thus operate as more than an analytic taxonomy: they become a generative framework for considering how design, in dialogue with regulation, political practices, activism, advocacy, and community work, can contribute to transforming absence into recognition, accountability, and practices of justice. As Frischknecht reminds us in this issue, the conditions under which 'missing data' are made available — how, when, and for whom — are central to ensuring that the process of transforming absence into recognition does not inadvertently introduce new risks for social justice.

4

This reflection draws on direct observation of the community-based data collection initiative developed by the *Laboratorio Salute Popolare* in Bologna (Italy) <https://www.laboratoriosalutepopolare.it/triage-sociale-2/>

The Open Debate Contribution

Rather than aspiring to total representation, many of the approaches presented in this issue turn to ambiguity, uncertainty, and opacity as generative strategies — epistemic tools that resist the extractivist logic of datafication and invite alternative forms of sense-making (Mattern, 2017). Through practices such as counterdata production, participatory mapping, and critical data visualization, this issue proposes design as a lens to interrogate and challenge structural modes of absence. In this context, absence becomes a material through which designers can reveal, challenge, and potentially reconfigure the epistemic hierarchies embedded in digital infrastructures.

Design is thus framed not as a neutral interface for representing reality, but as a situated, critical inquiry, capable of rendering visible the politics of invisibility and enabling collective processes of knowledge construction. Drawing on feminist and justice-based methodologies, contributors reimagine design as a vehicle to engage with that which is missing: to acknowledge absence, to situate it historically, and to generate spaces for recognition, care, and action.

This issue articulates its investigation through four complementary contributions, each addressing absence from a distinct yet intersecting perspective.

In the paper, *Life After Visualization. How to Recover Data That Elude Visualization and How to Revive Data That Have Been Made Visual*, Margherita Ascari and Donato Ricci explore how absence can be made operative within design through reflective visualization. Their contribution challenges conventional notions of data representation, investigating how visual semantics can activate traces of the unrecorded — what was omitted, excluded, or made unreadable. Visualization here becomes a speculative and political act with transformative potential, especially when practiced in participatory ways. Drawing on experimental projects from the médialab at Sciences Po and the work of the Advanced Design Unit at the Università di Bologna on the *Collective Archive for Climate Emergency Memory*, the paper outlines two problematic aspects of ‘missing data’ (e.g., escaping data and post-visualization data) and the possible design strategies to address them.

Max Frischknecht interrogates ‘missing data’ as an epistemological and political question in his contribution *Missing Data as Political Force*. His essay examines the complexities of ‘missing data’ as something that is not inherently positive or negative. ‘Missing data’ can, in fact, be framed as an advantage — particularly when data that could be used to fuel discrimination or to target specific groups with violent state action are missing. Turning the perspective of absence on its head, Frischknecht’s examples show that data can also be missing ‘from’ institutions, when data created by minority groups are withheld from public authorities to enhance safety: “This shows that missing data is a relational concept that implies directionality”. What is missing, when, and for whom shapes how we judge absence, its purpose and its effects. Drawing on Nancy Fraser’s concept of “abnormal justice”, Frischknecht highlights at least three roles for design: (a) to enhance digital sovereignty that can address

questions of misdistribution; (b) to adopt a constructivist approach to cultural forms of data; and (c) to shape attentive ways of gathering, accessing and controlling data through design practices inspired by principles of justice.

In this Open Debate, we are particularly pleased to host an interview with Catherine D'Ignazio, whose work has directly informed and influenced this issue and our research on 'missing data'. In the interview, conducted online in July 2025 and titled *Restorative Data Science and the Transformative Power of Absence*, the production of counterdata emerges as a form of epistemic resistance. Through projects such as *Counting Feminicide*, design becomes an infrastructure for remembrance, testimony, and protest — addressing systemic silences around gender-based violence and offering a reparative politics of data.

Following D'Ignazio, the real shift — from conventional data science to restorative data practices—lies not so much in methods or techniques, but in the underlying purpose of engaging with data in particular ways. Notably, the process of identifying the motivations for collecting and using data should not be led by abstract research agendas, but by the objectives and lived experiences of those directly affected. In articulating the motivation for data collection and use, D'Ignazio emphasizes that the difference between conventional and restorative data practices is teleological — going beyond the pretense of technocratic neutrality.

Finally, this issue hosts a visual essay that collects inputs from different case studies and initiatives that we briefly introduced before. This visual essay was initially planned to host the work from Visualizing Palestine (VP), a Non-Governmental Organization (NGO) that uses data and research to visually communicate Palestinian experiences to provoke narrative change. In the revised version of the visual essay, next to a selection of visuals from VP and their reflections on their methodology, we now present a selection of case studies that engage with different forms of missing data and develop alternative methodological and visual strategies to identify, interpret, and work through absence⁵.

What is common across the different contributions is a shared challenge to the idea of data neutrality; the commitment to addressing questions of (in)justice through — and because of — data; a demand for participation; an understanding of 'counterdata' as resistance; the centrality of community-based processes; and a call for situated, restorative, and justice-oriented approaches to knowledge production.

The idea of 'counterdata' as resistance emerges as a key conceptual and methodological orientation. It positions data work as a form of dissent and repair: the act of producing, curating, or visualizing data becomes a means to contest structural oppression — whether patriarchal, racial, colonial, or extractivist — and to reclaim agency and representation. 'Counterdata' practices thus shift the focus from accumulation toward accountability, redefining what counts as evidence and for whom it matters.

Equally significant is the emphasis on collective processes. Participation is not reduced to mere inclusion, but reimaged as an epistemic condition that redistributes authority, challenges techno-

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Following the usual editorial evaluation process, the Editorial Board of *diid* decided to reconsider the publication of the visual essay as originally planned. The debate that emerged opened up a methodological reflection and led to the subsequent expansion of the section, with the aim of exploring different types of practices, including that of Visualizing Palestine. We were informed that *diid* will dedicate a specific issue to the broader framework of *Design in Times of Conflicts*, which will include the contribution from Visualizing Palestine. While we look forward to reading the special issue, we regret that we were unable to host the full work of Visualizing Palestine in this Open Debate, as initially planned.

cratic hierarchies, and grounds design in lived experience. Through collective inquiry, interpretation, and action, design becomes a space for negotiating meanings, fostering recognition, and enabling the articulation of plural voices within data systems.

Finally, the contributions converge around situated and restorative approaches to working with absence and invisibility. These approaches shift the focus from the pursuit of completeness to an ethics of attentiveness and care, acknowledging that every representation entails forms of exclusion. By reintroducing context, temporality, and relationality into data practices, design assumes a restorative function — one that not only makes visible but also repairs and rebalances the conditions of visibility itself.

Together, these reflections articulate a shared understanding of design as both critical and generative: a practice that interrogates the epistemic hierarchies inscribed in data infrastructures, while constructing alternative modes of knowing and relating that foreground justice, accountability, and collective meaning-making.

Conclusion. Designing with Absence as Situated and Critical Practice

In contemporary debates, absence is often understood as a gap to be filled or a mistake to be corrected. This issue instead proposes viewing absence as a constitutive element of knowledge production and as a material with which design can work. What is missing is not neutral; it reflects decisions, conventions, and relations of power that determine what is valued, recorded, or remembered.

This editorial introduction has as its primary ambition to advance an understanding of ‘missing data’ as material for design, and to provide typologies of absence as a generative framework — progressing from categorization to situated counterstrategy — to demonstrate the importance of beginning with an analysis of the reasons for absence, in order to later deploy the most appropriate strategies to address it. Recognizing different modes of absence allows design to engage more consciously with the politics of visibility. Instead of treating data as a given, designers can question what becomes visible and under what conditions. This approach opens possibilities for practices that cultivate responsibility, dialogue, and shared interpretation, positioning design as a field of mediation between representation and lived experience. Approaching absence as a material for design shifts attention from correcting data to understanding the systems and relations through which invisibility is produced. In doing so, design can contribute to more attentive and equitable information ecologies, rendering perceptible forms of experience that are currently marginalized or unrecorded. This perspective positions design as a cultural and epistemic practice capable of engaging with the tensions between what becomes visible and what remains unseen.

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She is a Ph.D. candidate in Architecture and Design Culture at the Università di Bologna. Her research explores digital cultural heritage through a data-informed service design perspective, analysing how institutions, communities, and territories interact in data-rich environments. She investigates how digital transformation reshapes the ways cultural heritage is accessed, interpreted and governed, with a particular focus on inclusion, accessibility, and the emergence of new cultural behaviours. Her work on youth engagement shows how data can illuminate shifts in cultural practices and support the development of future scenarios for heritage institutions. She is currently studying new forms of heritage literacy and developing design approaches that help institutions mobilise and translate data into more equitable and meaningful cultural experiences.

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