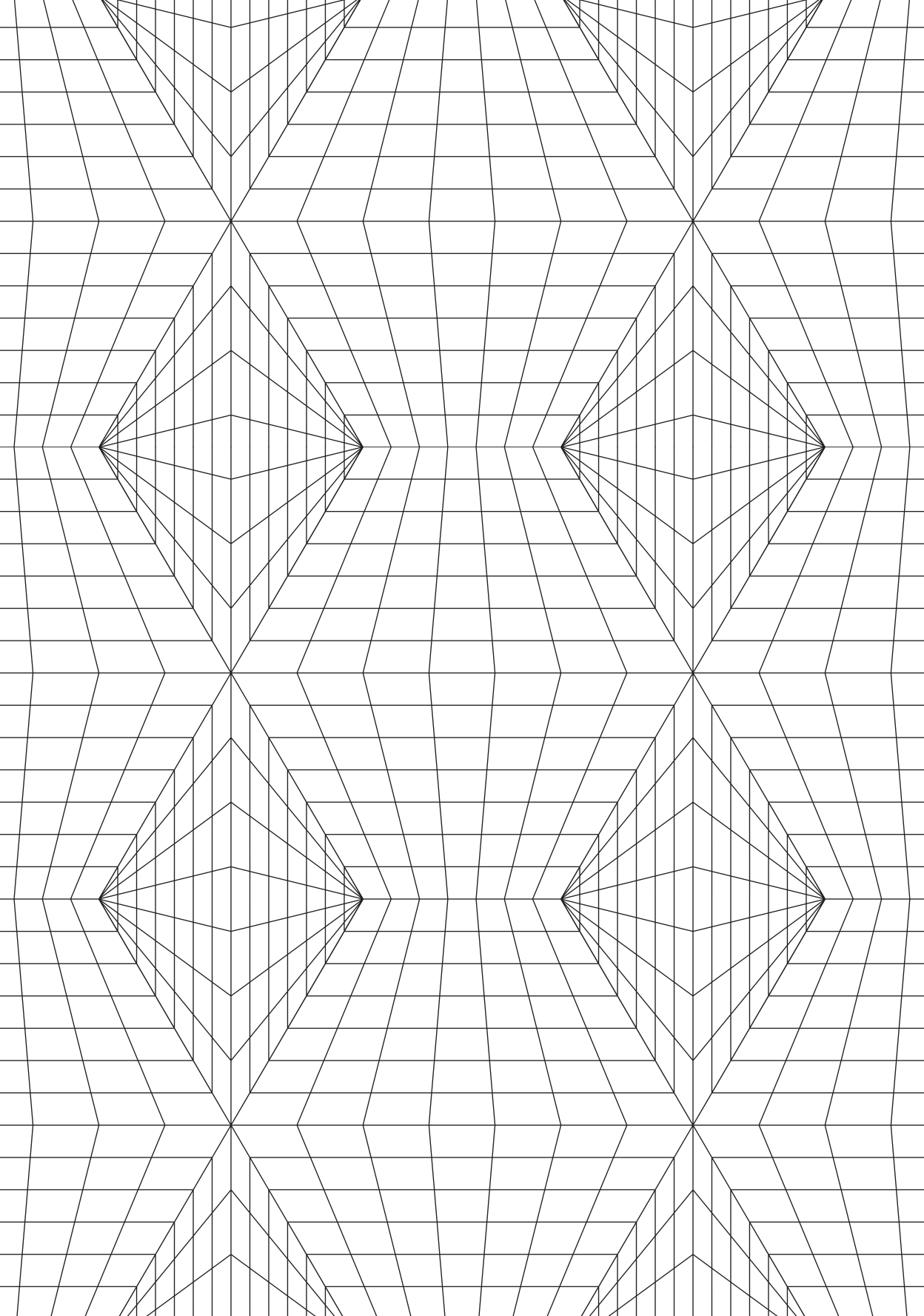
DISEGNO

VIII/02_*journal of design culture_Total(itarian) Design*



Disegno

Journal of Design Culture
Double-blind peer-reviewed, open access scholarly journal

Aims and Scope

Disegno publishes original research papers, essays, and reviews on all aspects of design cultures. We understand the notion of design culture as resolutely broad: our aim is to freely discuss the designed environment as mutually intertwined strands of sociocultural products, practices, and discourses. This attitude traverses the disciplinary boundaries between art, design, and visual culture and is therefore open to all themes related to sociocultural creativity and innovation. Our post-disciplinary endeavour welcomes intellectual contributions from all members of different design cultures. Besides providing a lively platform for debating issues of design culture, our specific aim is to consolidate and enhance the emerging field of design culture studies in the Central European academia by providing criticism of fundamental biases and misleading cultural imprinting with respect to the field of design.

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INTRODUCTION
THE RUSSIAN DOLLS OF BEING, OR WHAT GOD'S EYE TELLS THE BOT'S BRAIN

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This issue brings together research papers, essays, and interviews that examine design, technology, and political imagination in an age defined by claims to total overview. Accordingly, this introduction attempts to situate the contributions from mapping and scale to AI and cybernetics, and, from degrowth and politics to historical design debates.

*

In Béla Tarr and László Krasznahorkai's *Werckmeister Harmonies*, the two protagonists with sensitivities beyond their world engage with the all-seeing eye of a dead whale of the travelling circus which brought destruction and shame on their town. The whale-in-the-truck motif was prefigured by a travelling spectacle that toured Eastern Europe in the sixties: a Western spy act, as common wisdom held, tracing actual military roads beneath the distorted public maps.

Curiously, Tarr has recently revealed that the godforsaken locations of their earlier collaboration, *Sátántangó* were researched with the help of military maps (Tarr 2025) which brings the two worlds into a strange loop. Would that create a shared world for their inhabitants?

In "Anti-Zoom" Bruno Latour writes "The relationship between a surveyor in the field walking along a trench on a segment of road, and his or her colleague back in the lab poring over a false-color satellite sweep that covers the same area, is not one of inclusion" (Latour 2014, 122). Ignoring this distinction, he argues, produces a false sense of globality—an illusion of absolute overview—when only a new concept of "terrestrial being," a post-national conception of the homeland, could secure human survival.

Latour attributes such categorial mistakes to "the zoom effect": the cartographical illusion—taken to the extremes by Google Earth—that we can see and manipulate "our world" in infinite layers perceived as a smooth continuum. When we shift from one scale to the other, "the latter does not contain the same information as the former: it contains

other information that might (or might not) coincide with what appears in the former"—"levels of reality do not nestle one within the other like Russian dolls" (Latour 2014, 121)."

To visualise "data of different natures originating from various pieces of apparatus and belonging to totally distinct disciplines," we must instead focus on connectivity and perhaps rely on artists to do the job, Latour (2014, 121) claims. Serbian artist Vladan Joler is doing exactly this by counter-mapping both historical empires and contemporary AI systems along paths of connectivity—systems that "aspire to map the world" (Crawford and Joler 2018), a world in which metaphors such as "the cloud" or "the internet" disguise the "complete chaos" behind them, as Joler remarks in his interview with Ábris Gryllus.

There are parallels between this work and what the research papers of this issue investigate. Sándor Őze writes about the history of cybernetics, interpreting it as a total extension of technological logic while Dávid Csűrös and Ákos Schneider introduce the concept of predictive design, an unfolding phenomenon in which humans may become optimisable elements of total design environments.

Doing the same visually makes certain challenges more manifest, however. As Latour reminds, "the data are richer in connectivity than are the (inevitably limited) projections used to organise them" (Latour 2014, 123). This surplus becomes apparent in *Calculating Empires*—Joler's 2025 Venice Silver Lion–winning collaboration with Kate Crawford (2023)—which, at three by twenty-four meters, "begins to approach the limits of human perception," as Joler admits to Gryllus. We thus come dangerously close to Borges's "Map of the Empire whose size was that of the Empire"—a parable (Borges [1946] 1998) Crawford and Joler invoked a few years ago to describe the AI systems they set out to counter-map (Crawford and Joler 2018).

The impossibility of a global overview—or of anything like global common sense, and consequently of global action—appears in Dennis Meadows's contribution as well, originally published in the most recent French edition of *The Limits to Growth* (Meadows et al. 2022). Like Latour, Meadows is convinced that nation-states, beholden to short-term fixes, are unable to address climate change and other complex, long-term global threats. Sustainability, he argues, "achieved by agreement and sustained, concerted action by all the globe's important players […] will never happen." By contrast, resilience "can be achieved by individuals through short-term, local action." Still, Meadows cannot but chide "[t]hose blocking attempts to reduce fertility" for implicitly opting for a heightened death ratio in the coming decline.

Degrowth can constitute, however, a chicken-and-egg problem. Ben Highmore, in his interview with Márton Szentpéteri, argues, following Kate Soper, that it is not countries with the highest birth ratios that need to degrow, but the wealthy West, in order that other countries "reach

a certain level of wealth and capacity." A tough sell "if it's sold purely as loss—you're going to miss out on your computer games, your endless ability to consume." Like Soper, Highmore argues for a "new hedonism," and he also refuses a paralysing view of "total aestheticisation," one in which even consciousness is designed, leaving no space for authenticity and action.

These questions—of design, capitalism and aestheticisation—also figure heavily in Márton Horn's essay and Ármin Tillmann's review. Writing about Richard Shusterman and Bálint Veres's *Somaesthetics and Design Culture*, Tillmann ponders whether the concept of design can ever be fully freed from its original context, while Horn addresses the changing role of museums in relation to the experience industry and the challenges of inclusivity.

Just a few years ago, a seemingly commonsensical exhibition on Nazi design at the Design Museum Den Bosch ignited debates in the Netherlands about whether it should even be permitted to discuss the "aestheticisation of politics" and what made the design of the Third Reich work for so many. In our call for this issue, we likewise encouraged—alongside grand abstractions—contributions that engage with the more palpable phenomena of historical and contemporary totalitarianisms and authoritarianisms. The absence of submissions engaging with the latter, and the papers' focus instead on mechanisms of cybernetic and algorithmic control, is therefore noteworthy.

Naturally, as a design journal we must have an answer to everything. In his above-quoted essay, Latour attributes the original sin of the "zoom effect" to the Eameses' famous short film *Powers of Ten* (1977), which visualises a journey from the galactic to the subatomic. This can also be read as a symbolic shift: one in which the most influential designers leave the world of tangible objects behind, moving into information management.

The last era dominated by the belief that the tangible products of design and architecture (intertwined, or sometimes equated, with art) could be a force for a universalistic emancipatory turn—towards democracy for some, towards a leftist revolution for others—was perhaps the 1920s–30s. It is against this background that, in her interview with Ágnes Anna Sebestyén, Robin Schuldenfrei talks about the choices Bauhaus designers faced concerning whether—and for how long—to try to adapt to Nazi Germany, and how those who opted to emigrate (or had no choice to begin with) adapted themselves and their designs to new contexts and particularities.

All this may be tied back to questions of growth, degrowth and the possibility of a world designed for eternity. As Ben Highmore remarks at one point in our wide-ranging interview, "When you read Benjamin [...] you can't predict what he's going to say."

One of Benjamin's most discussed notions must be his lines about the true nature of revolution in the "Theses on the Philosophy of His-

tory" (Benjamin [1940] 1968). In Boris Groys's words, "Benjamin was right when he said that socialist revolution, and revolution in general, is more of an attempt to stop progress and momentum, to pull the emergency brake […], to stop progress and capitalist industrial dynamics." "[G]lobalisation leads to a situation where further dynamics suddenly become impossible," Groys follows, "and at that moment, everyone will turn to the tradition of stagnation. (Groys 2018, 29, my translation)"

Groys, in general, interprets many avant-garde design actors in a similar vein: as harbingers of an apocalypse that brings the end of times by creating—or revealing—the ultimate design of everything. In the Bauhaus, this would apply best to Hannes Meyer, the second director, who demanded total 'insight into the soul of the society' and conceived of design as a self-explanatory, style-free fulfilment of biological needs, to be realised by his vision of a Bauhaus community—one that despised individualism and "monkey-like intellectual agility as a talent" (Meyer 1929, 2). But Moholy-Nagy and Gropius already resented the failure to achieve mass production's socially transformative scale, and Moholy-Nagy—who, like Gropius, opposed Meyer and left upon his appointment—also held "a deep suspicion of verbal smartness" (S. Moholy-Nagy 1950, 191) and championed "a new type of creative man who was more an engineer and designer of the world than [… a] genius" (Forgács 2010, 65)

A previous book by Schuldenfrei tackling such controversies, Luxury and Modernism, starts with the comparison of two images: a photo of Walter Gropius's own bathroom and the same photo an Gropius's 1930 book with the marble veins of the sinks retouched. Bathroom marble may be an under-researched aspect of design ideologies. Donald Trump has recently replaced the clean art deco tiles of the White House's Lincoln Bathroom with dizzying black and white marble he considers period Lincoln. And if one visits the Villa Stiassni in Brno, one will be told by the guide that the bathrooms—originally austere spaces in the otherwise reluctantly modernist mansion—were remodelled in Cuban green marble at the direction of Fidel Castro after his stay there during the decades the building served as a state guesthouse.

Now, marble veins are just fine to realise that beyond adjusting our lives to maps, we can also treat various things as maps—and then experience our worlds accordingly. Recall Jacques Tati's Mr. Hulot in *Playtime*, stumbling through the automated, soulless glass and steel structures of a new Paris, to reach the grand opening of a fancy restaurant. As the place starts to fall to pieces and the people concurrently embrace chaos, Mr. Hulot—a gentle angel of history—tries to help a fellow find his way on a map, held against a column. The drunk man's index wanders off the map and pursues its journey on the congruent pattern of the marble slates. (Or take György Sándor's psychogeography-tinged candid camera act from the eighties in which he asks for directions in downtown Bu-

dapest, using a sewing pattern from the coveted West German fashion magazine, Burda. It is all a question of information design.)

These days Villa Stiassni houses the Czech National Heritage Institute, whose tasks included restoring its very own building to a historically satisfying condition. The issue of the green marble bathroom emerged, of course. Fortunately, Mr. and Mrs. Stiassni had separate bathrooms: one was restored to its hypothetical original, while the other retained all the marble additions. Thus arrived the best of both worlds, where design stops time in its tracks yet still allows our imagination to roam.

Olivér Horváth

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FROM PARTICIPATION TO EXTRACTION: THE RISE OF PREDICTIVE DESIGN

Dávid Csűrös and Ákos Schneider

ABSTRACT

This paper introduces the concept of predictive design (PD) to critically examine how data-driven design methods are reshaping human-centred design (HCD). While HCD traditionally emphasises participation, empathy, and qualitative insight, the rise of predictive practices—such as anticipatory design and predictive UX—signals a shift toward a different mode of futuring in digital environments: one rooted in data science rather than open-ended dialogue with users. At the same time, the rhetoric of user-centredness is often used to justify large-scale data extraction, blurring the line between service and surveillance. This shift creates a tension with HCD's commitment to designing by, for, and with people. Drawing on historical, epistemological, and cultural perspectives, we trace how predictive practices have gained momentum in design, particularly within the platforms of Google and Facebook. The paper outlines the epistemic logic of PD, distinguishes it from adjacent concepts, and explores its implications for user agency, participation, and the role of design in surveillance capitalism.

#Predictive Design, #Human-Centred Design, #Data-Driven Design, #Design Culture, #Algorithmic Culture

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1. INTRODUCTION

All user-centred design is predictive to some degree: when a handle is shaped, the designer anticipates how it will be grasped; when a sign is created, it presumes a trajectory of visual attention; when a button is placed on a webpage, assumptions are made about where users are likely to click; when an app sends a notification, it forecasts the most opportune moment to prompt engagement. Designing for users has always involved anticipating behaviours, needs, and expectations, making prediction and abductive reasoning[1] integral aspects of design practice. However, in recent decades, both the methods of operationalising prediction and the epistemological assumptions behind it have shifted significantly.

Traditional design frameworks—such as user-centred and human-centred design—rely on several key approaches, including user research methods like interviews and surveys to gain insight into user behaviours and needs; the development of personas to embody typical users and inform design choices; prototyping to build preliminary models of potential solutions; user testing to assess these prototypes; and iterative design, which emphasises ongoing refinement based on feedback and evaluation (Norman [1988] 2016; Brown 2009). These practices emphasise active user participation and focus on producing solutions that are practical and intuitive.

While such methods are grounded in qualitative engagement, contemporary design practices adopt different epistemic approaches—yet remain essentially user-centred. Data-driven design practices now rely on the analysis of large-scale behavioural data, statistical modelling, and algorithmic inference. This transformation has been fuelled by the widespread availability of digital traces generated through everyday user interactions.

The growing integration of data science into UX design[2] marks a profound shift in how knowledge about

[1] *Design practices typically involve projections and assumptions, the testing and revision of which drive the iterative process forward. According to Wolfgang Jonas, abductive reasoning is central to design, where conclusions gravitate toward the "best available" or the "most likely" explanation—thus always involving a degree of uncertainty. Jonas aligns this mode of reasoning with projection, stating that "projection represents the abductive step" as the "central designerly phase" (2014, 4)—a form of inference that operates alongside, but distinct from, deduction and induction.*

[2] *User Experience (UX) design refers to the process of creating products or systems that offer meaningful, intuitive, and engaging interactions by focusing on users' needs, behaviours, and the contexts of use. The concept emerged from the convergence of human-computer interaction (HCI), cognitive psychology, and design, with roots tracing back to ergonomics and usability studies in the mid-twentieth century. Hassenzahl defines UX as "experience that comes about through the use of (interactive) products," ([2010] 2022, 4) emphasizing that it focuses on shaping how people feel, think, and act through interaction with technology rather than just what they accomplish with it. He further argues, "User Experience is not much different from experience per se. It simply focuses our interest on interactive products… as creators, facilitators and mediators of experience" ([2010] 2022, 13). The term "user experience" was popularised by Donald Norman in the 1990s while working at Apple. Norman ([1988] 2016, xiii–xiv, 233) emphasises the importance of designing not just for functionality and efficiency but for holistic, emotionally resonant user experiences. This shift echoes the historical transition from engineering-driven to human-centred technology.*

users is generated, how design choices are legitimised, and how possible futures are enacted. Instead of relying on interpretative engagement or participatory methods, design is increasingly steered by predictive analytics that extrapolate future behaviour from past data. This evolution not only challenges the epistemological underpinnings of human-centred design (HCD) but also raises ethical concerns about user autonomy and agency, while reframing design practice as a mode of behavioural forecasting.

This paper introduces predictive design (PD) with the aim of offering a conceptual and critical framework for understanding how data-driven, anticipatory design practices accelerate this transformation. By treating behavioural traces as its primary design material, PD contributes to the reconfiguration of users as dynamic, probabilistic data profiles, and in doing so participates in a wider reshaping of design culture. Our inquiry is guided by two questions:

(1) In what ways does the emergence of PD redefine the core principles of HCD, particularly its commitment to participation?

(2) What are the broader epistemological and ethical implications of PD practices that frame human behaviour as a resource to be modelled and optimised?

We propose PD as a conceptual tool for Design Culture studies (Julier [2000] 2014; Julier and Munch 2019), which understands design not merely as a set of professional practices but as a cultural, economic, and political force embedded in everyday life. Julier (2017) argues that design culture encompasses the work of designers, the production of design (including its mediation and circulation), as well as the consumption of designed artifacts and systems—all of which shape and are shaped by social and economic imaginaries. From this perspective, PD can be seen as part of a wider cultural transformation, where design no longer simply mediates human experiences, but actively anticipates, modulates, and monetises them through algorithmic systems.

In this light, PD is not only a set of emerging practices within predictive UX design but also a symptom of deeper shifts in how design functions under platform capitalism[3] (Srnicek 2016). It reflects what Julier calls the "instrumentalisation of design" (2000 [2014], 12): its alignment with the business logics of commodification and corporatisation, optimisation imperatives, and data-driven governance. As such, PD marks a moment where design culture itself is reconfigured—moving from participatory engagement toward predictive control. In drawing on design culture as a critical lens, we aim to foreground PD as more than a methodological trend: it is a manifestation of a changing cultural paradigm in which the role of design is increasingly tied to behavioural extraction, anticipatory systems, and the production of predictive value.

While focusing on the user is by no means new in the history of modern design[4], the rise of personal computing and the emergence of

[3] *According to Nick Srnicek (2016), platform capitalism refers to a new economic model in which digital platforms and tech companies—like Google, Amazon, and Facebook—operate as intermediaries that extract, analyse, and monetise user data, becoming central infrastructures of contemporary capitalism.*

[4] *See Lupton (2014) for a historical overview of user-centred approaches in twentieth-century design.*

human-computer interaction (HCI) introduced a new level of complexity. Making digital technologies usable for non-experts required more structured and refined approaches. As a response, user-centred and human-centred design methodologies were developed—laying the groundwork for what would later become the field of user experience design. In the context of this paper, references to "design" generally pertain to UX design in digital environments—specifically, the design and engineering of digital interfaces and services that enable social communication, content sharing, and information organisation, such as Facebook, Instagram, YouTube, and Google—as the concept of PD is primarily traceable and applicable within this domain. Unless otherwise specified, "data" refers to quantitative user data, including both pre-existing datasets (e.g., user profiles, browsing history, content preferences) and real-time data streams (e.g., location tracking, scrolling behaviour, click patterns, and watch time).

The study is structured as follows: section 2 outlines the conceptual and methodological foundations of HCD, introducing a spectrum of user involvement that ranges from designing *for* to designing *by* users. Section 3 traces a brief history of data use in design, situating current practices within a longer lineage of scientific management, ergonomics, and participatory approaches. Section 4 examines the shift "from participation to extraction," focusing on how large-scale data capture and analytics have reoriented design practice in the platform economy, with particular attention to Google and Facebook. Section 5 identifies the rise of a new epistemological paradigm rooted in algorithmic culture, drawing on Kitchin, Galloway, and Striphas to frame the cultural and epistemic conditions under which prediction becomes a dominant design logic. Section 6 introduces PD as a critical concept for Design Culture studies, detailing its conceptual position, thematic priorities, and methodological foundations. Section 7 discusses the implications of PD for participation, agency, and the political economy of design, before the paper concludes by situating PD as both a methodological evolution and a cultural formation that reflects—and reinforces—broader transformations in contemporary design culture.

2. HUMAN-CENTRED DESIGN

Over the past century the scope of design has undergone a radical transformation from form-giving to the design of interactions, systems, organisations and human experience itself. HCD stands at the forefront of this shift. It is an umbrella term for methodologies that place the user at the centre of the design process—opposed to technology-driven or designer-centred approaches that emphasise technological innovation or the designer's intuition. The aim of HCD is to develop products, services, and interfaces that are not just intuitive and usable but responsive to

a broad spectrum of human needs; ranging from ergonomic and cognitive dimensions to emotional, social, and even metaphysical concerns (Giacomin 2014). Understanding people's psychological and socio-cultural dispositions is therefore central to HCD, and this endeavour has been supported by empirical knowledge developed throughout the twentieth century in fields such as ergonomics, medical science, experimental psychology, cognitive science, and the social sciences. These insights proved foundational in shaping early forms of HCD, including user-centred design, participatory design (and its later evolutions in co-design), social design, and inclusive design.

The degree to which these approaches involve users—and the methods they do so—varies and can be mapped along a spectrum (fig.1): at one end lies design *by* users, emphasizing user autonomy and co-creation; at the other , design *for* users, where designers act on behalf of users; while design *with* users represents a collaborative middle ground. For example, as an end-user development framework meta-design[5] exemplifies designing *by* people; co-design and participatory design align more closely with designing *with* people; whereas inclusive design and user-centred design typically represent approaches to designing for people.

As we move along this spectrum from "design *by*" to "design *for*", we also observe a corresponding shift in methodological orientation: the prevalence of qualitative, interpretive methods diminishes, while quantitative, data-driven approaches gain dominance. Methods emphasising co-creation or user-led development often rely on ethnographic research, contextual inquiry, and participatory workshops to grasp users' situated knowledge and tacit practices. In contrast, methods positioned toward the "design *for*" end of the spectrum—particularly within the context of large-scale UX design—tend to employ behavioural tracking, A/B testing[6], and statistical modelling to infer preferences and optimise user flows. This methodological drift reflects not only different forms of user involvement but also diverging epistemologies: one rooted in understanding human meaning-making, the other in modelling and predicting behaviour through measurable patterns.

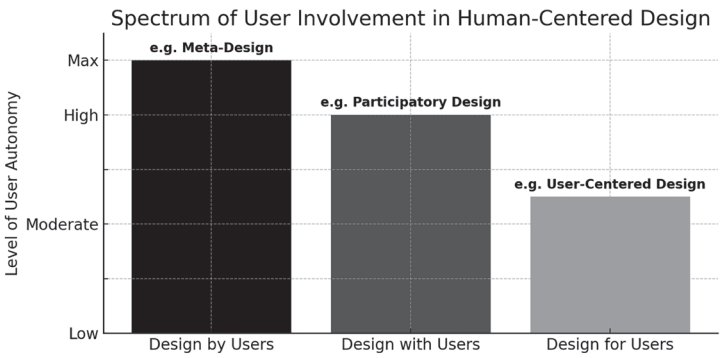

FIGURE 1. *A spectrum of user involvement in HCD processes.*

[5] *Meta-design refers to "design for designers" (Fisher and Scharff 2000), that is, the creation of tools, platforms, and frameworks that enable end users—as "owners of problems"—to act as co-designers by adapting, extending, and evolving a system to fit their needs over time (Fischer et al. 2004, 35). It emphasises open-endedness, user empowerment, and collaborative creativity, and is often associated with open-source software, participatory platforms, and maker cultures. In the HCD spectrum, meta-design aligns with "design by users," as it maximises user autonomy in shaping outcomes.*

[6] *A/B testing is a controlled experimental method in which two or more variants of a design are presented to different user segments under the same conditions, and their performance is compared using statistical analysis to determine the most effective version. In contemporary UX practice, A/B testing is often integrated into continuous optimisation workflows, allowing design decisions to be guided by behavioural metrics rather than solely by designer intuition (Kohavi et al. 2009).*

3. BRIEF HISTORY OF DATA IN DESIGN

The use of quantitative and qualitative data in the design process has evolved significantly since the beginning of the twentieth century, due to a complex interplay of technological advancements, shifting epistemological paradigms, changing concepts of the user, and the increasing entanglement of design with other disciplines.

Some of the earliest systematic attempts to rationalise and optimise human activity through data include Taylor's time-and-motion studies, the Gilbreths' principles of motion economy, Neufert's standardised measurements, and Le Corbusier's Modulor. These methods exemplify a broader modernist ambition to render bodily movement measurable, standardised, and ultimately governable, laying the groundwork for what would later become a central concern in human-machine interaction: the systematic observation and modelling of the user.

After World War II, industrial design was increasingly reoriented towards consumer goods, and the founding of the Ergonomics Research Society in 1949 points to the institutionalisation of design practices that optimise products for human use. This was part of a broader movement from purely aesthetic or engineering-driven design toward systematic study of human capabilities, limitations, and comfort in human-machine interactions. Although the direct use of ergonomics in design was sporadic, it had a long-lasting effect: it shifted the focus of design from things to their relationships with humans, representing the "human-machine ensemble" as fundamentally knowable by statistical analysis. As Theodora Vardouli (2016, 68) observes, the basic techniques of ergonomics were developed through experimental data collection and analysis, effectively "producing design norms for the statistical normal." Henry Dreyfuss' *The Measure of Man* (1960) exemplifies this logic with its reliance on anthropometric data, aiming to standardise design around the average Joe and Josephine.

In the 50s and 60s—affected by wartime system-thinking and a newly found techno-optimism—figures like Christopher Alexander, Bruce Archer, and Horst Rittel sought to improve the design process by making it more "scientific" (Langrish 2016, 4). Design methods in the UK and the Design Methods Movement in the US were initially shaped by positivist ideals, drawing from ergonomics and systems engineering to formalise design as a rational, data-driven process. Early approaches prioritised optimisation, predictability, and statistical norms—often modelling the user as a generalisable, measurable component of a system. By the late 1960s, this view faced growing internal critique; Rittel, Alexander, and Jones themselves began questioning whether such scientific formalism could address the ill-defined and contextual nature of real-world design problems (Vardouli 2016, 66).

This marked a second-generation shift in design methods—reflected in initiatives like DRS's Design Participation conference in 1971

and the founding of the Environmental Design Research Association (EDRA)—which emphasised qualitative research, user participation, and human-centred values. It recognised that good design required not only empirical data, but also situated knowledge, ethical judgment, and collaboration among diverse stakeholders (Sanoff and Cohn, 2021).

In parallel, a participatory perspective emerged in the form of Scandinavian Participatory Design during the 1970s, where users, especially workers, became co-designers. Here, qualitative input, like stories, feedback, and lived experiences became central, evolving design from a top-down activity toward a horizontal, collaborative project. The result of this design process is seen as the culmination of agreements and interactions. The principle of participation has provided many successful examples, spanning from communities redesigning urban spaces and individuals customising personal devices to user-centred transformation of services. A core principle of participative methods, such as Meta-Design or Co-Design asserts that users are recognised as "experts on their own experiences" (Visser et al. 2005).

Meanwhile, in the United States, a different but related trajectory was unfolding in the emerging field of Human–Computer Interaction. A landmark moment came in 1968 with Douglas Engelbart's "Mother of All Demos," presented while he was director of the Augmentation Research Center at Stanford Research Institute. The demonstration showcased innovations such as the computer mouse, hypertext, real-time collaborative editing, and video conferencing. Beyond its technological breakthroughs, the demonstration embodied a vision of interactive computing as a partnership between humans and machines, foreshadowing many of the usability and interaction paradigms that would later become central to HCI and, eventually, to user-centred design (UCD).

By the late 1980s, these threads coalesced into UCD, first linked to developments at IBM. At the Thomas J. Watson Research Center, Gould and Boies (1983) introduced a methodological framework that foregrounded four key components: focusing on the user group, integrating users into the design process, relying on empirical data, and iterative development. Later, Gould and Lewis (1985) revised this approach by excluding direct user participation, consolidating the remaining elements into the "three principles of system design." Donald Norman, Stephen Draper and Liam Bannon (1986) reframed these principles as a design philosophy and introduced user-centred system design—the predecessor of UCD and HCD. Norman and his colleagues aimed to broaden the scope of design beyond empirical approaches and simple usability, while simultaneously emphasising the importance of understanding users' cognitive profiles through behavioural data. In a guiding essay from *User Centered System Design*, Bannon argues that to design usable systems, we need not only "detailed psychological models of how people think and communicate" but also "a more enlightened view of people" (Norman and Draper 1986, 25-26). Over

time, the user-centred framework evolved into human-centred UX design, which attempts to balance quantitative metrics with qualitative methods.

The historical trajectory of data use in modern design reveals a gradual expansion from early twentieth-century efforts to standardise and optimise human activity—rooted in industrial efficiency and modernist ideals—towards more participatory, qualitative, and human-centred approaches. While ergonomics, systems thinking, and design methods brought scientific rigor to the field, they also risked reducing users to statistical norms. The emergence of participatory design in Scandinavia, the visionary technological paradigms introduced in the field of Human-Computer Interaction, and the formalisation of user-centred design in the 1980s collectively reframed the role of the user from a passive subject of measurement to an active participant—or even co-creator—in the design process. This evolution laid the conceptual and methodological groundwork for contemporary human-centred design, where empirical data and human experience are intertwined in shaping products, systems, and services.

4. FROM PARTICIPATION TO EXTRACTION

This shift toward user participation laid the foundation for data-driven design, where user input became data to be captured and analysed. The term data-driven design was coined by Domazet et al. (1995) and the discussion about the role of modern data science in design started a few years later with the work by Kusiak and Tseng (2000), who described the first prototyped application of a data mining algorithm to generate, select, and validate solutions (Bertoni 2020). Subsequent research (e.g. Agard and Kusiak 2004; Menon et al. 2004) has proposed data mining methods for product development, showing how algorithms could be applied efficiently in the process. After the early interest in data-driven design, the real expansion of the field started with the emergence of big data and advanced machine learning algorithms.

User-centred system design's early ambition to model users' cognition and behaviour became technically feasible with the rise of the internet. Server logs and cookies in the mid-1990s enabled tracking of navigation and persistent user identification, while client-side scripting like JavaScript allowed fine-grained interaction monitoring. The rise of web analytics and A/B testing made it possible to collect and use behavioural data at scale, gradually pushing UI/UX design from participatory methods towards data-driven approaches. While contemporary design teams often embrace the principle that quantitative and qualitative insights must co-exist to "truly know the user" (Chilana et al. 2012; Lu et al. 2021), the rise of big data and predictive analytics has disrupted this balance—especially in large-scale UX environments such as social media platforms and search engines.

4.1 The Case of Google and Facebook

Google has played a key role in the shift from traditional user-centred methods to large-scale data collection and predictive practices. One of the early inflection points that positioned Google at the forefront of the data-mining business was the invention of the PageRank algorithm by Larry Page in 1998. In the early days of the web, searching for information was like finding a needle in a haystack. By emphasising relevance and speed, Google revolutionised web searches and also laid the foundation for a new model of targeted advertising. PageRank initially assessed the relevance of a webpage through the structure of inbound links, but this approach quickly became vulnerable to manipulation via link spam. In response, Google engineers began to integrate behavioural data—such as where users clicked and how long they remained on a page—into their ranking systems. The incorporation of such implicit feedback proved to be a decisive innovation, setting Google apart. However, the price users paid for this enhanced user experience was the commodification of their behaviour: every click, pause, and scroll became a data point in an ever-expanding apparatus of surveillance-based optimisation and advertising. As Shoshanna Zuboff (2019) notes, Google realised in the early 2000s that the behavioural data it collected—initially seen as a byproduct of user interaction—possessed immense economic potential. This "behavioural surplus" became the raw material for new predictive products and the foundation of a powerful surveillance-based business model.[7]

Later, Google became famous for constantly improving the design of their system based on insights gained by analytics and experiments. The company's chief economist, Hal Varian (2010) classifies "computer mediated transactions" into four categories: facilitate new forms of contract; facilitate data extraction and analysis; facilitate controlled experimentation; facilitate personalisation and customisation. This suggests that, from early on, Google recognised itself not merely as a service provider, but as an infrastructure for large-scale data extraction. As Varian's framework makes clear, the company's objective was to convert every digital interaction into predictive capital—a resource for targeted advertising and UX optimisation. Following this approach, by the late 2000s, Google had fully embraced a culture of continuous experimentation, embedding large-scale A/B testing into its everyday operations. In 2008 for instance, engineers and designers conducted more than 6,000 trials leading to hundreds of system modifications, many of which targeted either interface design or core algorithmic behaviour (Varian 2010, 9). Google's approach to predictive practices is reflected in a comment by co-founder Larry Page in the early 2010s, where he made clear that the company's aim is to anticipate users' preferences and find things they do not know but want to know (Levy 2011, 58). As stated on the company's official philosophy page: "We try to anticipate needs

[7] *Zuboff highlights this discovery as a pivotal moment in the emergence of surveillance capitalism, pointing to a key insight that transformed how user data was understood and utilised: "Amit Patel, a young Stanford graduate student with a special interest in 'data mining,' is frequently credited with the groundbreaking insight into the significance of Google's accidental data caches. His work with these data logs persuaded him that detailed stories about each user—thoughts, feelings, interests—could be constructed from the wake of unstructured signals that trailed every online action. These data, he concluded, actually provided a 'broad sensor of human behaviour' and could be put to immediate use in realising cofounder Larry Page's dream of Search as a comprehensive artificial intelligence." (Zuboff 2019, 69)*

not yet articulated by our global audience" (Google n.d.). What remains unacknowledged is that this predictive capacity rests on large-scale data collection and behavioural analysis.

Google's approach was adopted by Facebook, when one of the top executives of Google became Mark Zuckerberg's number two (Zuboff 2019, 92). By that time, Facebook had already introduced the algorithmically curated "News Feed" and its success marked the company's first step toward predictive content delivery. Facebook soon launched the "Facebook Platform" for third-party apps and the "Beacon" program which was an early data-mining initiative: it tracked Facebook users' actions on partner websites (like purchases) and broadcast them to friends' feeds without clear consent. The idea was to leverage user data from across the web for social advertising. While Beacon was shut down early, Facebook Platform continued to allow third-party apps to harvest data, and this expansive data sharing (nominally for richer user experiences) would later lead to the Cambridge Analytica scandal.[8]

The introduction of the "like" button in 2009 was also a step towards measuring users' preferences in nuanced details. Whenever a logged-in user visited a site with an integrated Facebook plug-in, data about that visit was sent back to Facebook, even if no click occurred. The like plug-in essentially functioned as a web tracker, allowing Facebook to gather information on which users were visiting what websites. Another significant step in the development of the predictive design paradigm was the establishment of Facebook's Growth Team led by Chamath Palihapitiya, who strongly believed that metrics should be preferred over designer intuition. This led to the famous "7–10 rule"—a pattern that emerged from user data—, which states that if people make at least 7 new friends on Facebook in 10 days, they will be far more likely to remain active on the site. According to Palihapitiya (2013), the 7–10 rule "was the single, sole focus" that governed every design decision at the time. A former employee at the Growth Team notes that "new product ideas at Facebook come from looking at correlations in data and seeing what aligns with the company's north star metric: retention." (Heintzman 2022)

A controversial example of Facebook's approach to design occurred in 2012: the "emotional contagion" experiment. Without informing users, Facebook's data science team manipulated the content of the news feed for about 689,000 people to be slightly more positive for some and more negative for others. Researchers wanted to know if seeing happier or sadder posts would influence users' own posting behaviour, essentially testing a hypothesis about emotional contagion through social networks. The results, published in 2014 (Kramer et al.), showed that users who saw fewer positive posts tended to post slightly more negative content themselves (and vice versa). From a design perspective, this experiment illustrates a new frontier: Facebook wasn't just reacting to user needs, it was attempting to predict and influence user emotions

[8] *The Cambridge Analytica scandal was the 2018 revelation that the political consulting firm improperly harvested personal data from more than 50 million Facebook users via a third-party quiz app, using it to build psychographic profiles for targeted political advertising—raising global concerns about data privacy, consent, and the political manipulation of social media platforms (Cadwalladr and Graham-Harrison, 2018).*

via algorithmic content curation. The study was widely condemned for breaching informed consent standards. Indeed, unlike a traditional HCD user test (where participants are informed and volunteer), users in the experiment had no idea that their experience was being altered for research purposes—it wasn't just testing UI layouts; it was testing psychological responses. Facebook subsequently added a clause to its terms of service allowing user data to be used for research, essentially formalising this quantitative, experiment-first design method as part of its operation. By 2014, Facebook could predict, with a high degree of accuracy, which posts users would comment on or which ads they would click, and designed the product to surface those items. This maximised certain engagement metrics but also meant each user's experience was being implicitly designed by machine predictions.

Taken together, Google may have invented the core strategy of leveraging user data exhaust for design/monetisation, but Facebook expanded it into the realm of intimate social interaction and scaled it globally. Key milestones like the news feed algorithm, the like button ecosystem, the Growth Team's metrics focus, and the various data controversies all illustrate a common theme: design decisions increasingly made by data and for data. This trajectory shows a departure from designing *with* users—the heart of HCD—to designing *through* users.

5. THE RISE OF A NEW EPISTEMOLOGICAL PARADIGM

As clearly reflected in this evolution of design methods, data has become one of the most critical assets of our time. Its influence is so pervasive that we are witnessing the emergence of a new epistemological paradigm, one that challenges foundational assumptions about how knowledge is created.

In contrast to traditional scientific methods—which rely on the formulation of hypotheses and their subsequent testing through experimentation—the algorithmic age privileges an *exploratory* mode of discovery where methods often search for patterns in large datasets without starting from a clear question or theory. Rob Kitchin (2014) articulates this transformation as a paradigm shift in epistemology in which data-intensive science gives rise to a data-driven (rather than knowledge-driven) mode of knowing. In this view, meaning is not imposed upon the data by the researcher but is instead revealed through algorithmic processes.[9] Kitchin emphasises that this shift is not merely technical but epistemological: it reconfigures the nature of knowledge, placing emphasis on immediacy, correlation, and predictive capacity over explanation and causality. This epistemological transformation is not confined to the sciences or knowledge production alone; it has profound implications for how societies imagine and govern their futures through anticipatory regimes.[10]

[9] *Cf. "Data-driven design (DDD) begins by considering the data in the absence of knowledge regarding its specific uses in order to foreground relationships within the data that may not have been previously considered." (Diamond et al. 2017, 515)*

[10] *Anticipatory regimes, as anthropologist Vincanne et al. (2009) call them, are contemporary ways of thinking, feeling, and governing through the future. In anticipatory regimes, the future is treated as a calculable terrain that should be optimised via prediction, risk management, and preparedness.*

If, as Kitchin suggests, the algorithmic turn reorders how knowledge is produced, Alexander R. Galloway reminds us that this reordering is felt first at the level of the digital interface: not as a neutral membrane, but as a threshold of mediation and control where actions are formatted, routed, and made legible. In Galloway's account, an interface is less a thing than an effect—"it is always a process or a translation" (2012, 33)—a site where bodies, symbols, and protocols meet and where power is exercised by shaping what can be seen and done. Designers, as the architects of these mediating layers, play a crucial role in defining how such processes are structured, what actions they enable or constrain, and how they translate broader systems into user experience. As Galloway states, "the interface is the place where information moves from one entity to another, from one node to another within the system" (2012, 31). Reading the contemporary screen this way links epistemology to governance: the same infrastructures that surface patterns from data also pre-format culture and conduct by delimiting the field of possible inputs, outputs, and relations. In the context of Kitchin's account of data-driven epistemology, this means that interfaces do not merely display the results of algorithmic processes; they co-produce them, shaping what patterns are surfaced, how they are acted upon, and ultimately how cultural and political agency is distributed. This sets the stage for *algorithmic culture* (Galloway 2006), where curation, decision-making, and organisation of cultural experience migrate from human gatekeepers to computational procedures. Here, automation not only curates culture but subtly governs the terms of participation itself.

Following Galloway's concept of algorithmic culture, Ted Striphas (2015) argues that in today's cultural environment—which has emerged from big data, predictive analytics, and cloud computing—the production and consumption of culture are increasingly affected by algorithmic manipulation[11]. Traditionally, cultural production was a domain governed by individuals and institutions; artists, designers, curators, critics, and other cultural gatekeepers played essential roles in determining what was considered valuable or noteworthy. However, the advent of sophisticated algorithms has gradually shifted these responsibilities from human hands to automated systems. Algorithms now curate our news feeds, recommend music and movies, and even influence the development of new cultural artifacts through data-driven insights.[12]

These developments point to the fact that algorithmic rationality has become a central organising logic across diverse domains, including design and culture. In the following section, we examine how this shift challenges the foundational commitments of user- and human-centred design and we introduce the concept of predictive design.

[11] *Lev Manovich (2018) refers to this stage of technological media as media analytics while also emphasizing that automation extends beyond cultural production to encompass the presentation and retrieval of all online content.*

[12] *A clear example of this cultural shift is Netflix's attempt to utilise big data analytics to identify user preferences and develop shows based on these predictions, contributing to the rise of "algorithmic television" (Shapiro 2020).*

6. PREDICTIVE DESIGN

Before addressing the challenges that algorithmic culture poses for design, it is important to note that data-driven design and predictive analytics have been recognised in academic research for their positive contributions across many domains. In healthcare, these methods enhance proactive risk identification and intervention (Rajkomar et al. 2019; Wiens et al. 2019; Wang et al. 2024); environmental applications benefit from predictive models that support sustainability by optimising energy use and reducing emissions (Ukoba et al. 2024; Rajaram 2025); urban planning leverages big data analytics to improve resilience, resource efficiency, and community engagement in smart cities (Al Nuaimi et al. 2015; Hashem et al. 2016; Soomro et al. 2019); and educational technologies utilise data-driven personalisation and accessibility features to support inclusive learning environments (Wang et al. 2014; Ayeni et al. 2024). Yet, while these applications demonstrate the clear utility of predictive analytics, their increasing integration into design practices raises critical theoretical and ethical concerns, as discussed in the literature (e.g. Friess 2010; van Bodegraven 2017; Gillespie 2013; Manovich 2018). The very mechanisms that enable predictive systems to anticipate needs and optimise outcomes also introduce new forms of power, opacity, and normativity into the design process.

To highlight these issues and to capture the deeper temporal and epistemic logic of anticipatory, data-driven design practices in contemporary algorithmic design culture, we introduce the concept of predictive design (PD). We propose PD as a comprehensive framework for understanding a diverse set of contemporary design phenomena that share a common feature: the use of predictive analytics as the primary basis for anticipating and shaping both design processes and user experiences. In a broad sense, PD refers to the underlying design logic of services that leverage behavioural data, machine learning, and profiling to anticipate and modulate user behaviour, while accumulating predictive capital—insights that are turned into commercial value and reused to refine user experience.

By foregrounding prediction as the dominant mode of reasoning in digital environments, PD aligns with the cultural and epistemic paradigm shift we discussed in the previous section. PD—viewed as an anticipatory regime—treats the future not as an open-ended space of speculation and negotiation, but as something knowable and operationalizable through extrapolation from past behaviour (cf. Schneider 2025). In doing so, it reshapes the aims, ethics, and politics of design. As Bratton (2015, 257) notes, "the evasive distance between the predicted path and the one taken directs the portraiture of future Users, one by one or in populations, as the repetition of irregular interactions is normalised into new models [...] second by second and measurement by measurement." (Bratton 2015, 257)

In reorienting design around the continuous anticipation of behaviour, PD also unsettles the very figure of the "user" on which human-centred design has traditionally relied. PD makes explicit what Bratton (2015, 271–289) describes as the "death of the user": a shift from a user imagined as a coherent subject at the conceptual centre of design strategy, to a multiplicity of statistically derived user-agents whose positions are continuously recomputed. From this perspective, platforms do not simply serve pre-given users, but actively construct and dissolve user positions.

The four main, interlinked themes in PD are *prediction, personalisation, automation, and optimisation. Prediction* involves anticipating user behaviour from historical and real-time data, as when Netflix's recommendation system forecasts what a viewer is likely to watch next based on past viewing patterns. *Personalisation* tailors interfaces and content to individual users, exemplified by Spotify's "Discover Weekly" playlists, which create a sense of bespoke curation while feeding back into the platform's predictive models. *Automation* delegates decision-making to algorithms, for example when Google Maps automatically reroutes drivers based on live traffic data without explicit user prompts. *Optimisation* continuously refines these processes through data-driven feedback loops, as seen in Amazon's constant A/B testing to maximise click-through rates and conversion.

In PD, these themes do not function in isolation: prediction informs personalisation, automation enacts those predictions in real time, and optimisation ensures the entire cycle becomes progressively more accurate and efficient. Together, they form the operational backbone of services that—under the banner of user-centred design—sustain continuous data capture while subtly reshaping user behaviour.

Within the framework of design culture studies, PD can be understood not only as a methodological development in UX practice, but as a cultural formation in its own right. design culture studies, as outlined by Julier ([2000] 2014; 2017; Julier and Munch, 2019), examines design as a complex interplay of interconnected practices and meanings that link the work of designers, the institutions and media that shape it, and the ways designed artifacts and systems are produced, circulated, and used. From this perspective, PD is more than a set of tools for anticipating user behaviour—it is a manifestation of the ways in which predictive logics permeate everyday life, shaping how we imagine the future, how we interact with technology, and how our behaviours are rendered as economic resources.

The conceptual position of PD within this field rests on three, connected observations:

Epistemic shift—PD embodies the algorithmic, data-driven mode of knowing discussed in earlier sections, translating it into design practice. It reframes the act of design from proposing possibilities to operationalising probabilities, embedding statistical reasoning at the core of creative decision-making.

Reconfiguration of participation—PD modifies the participatory ethos central to HCD by repositioning the user as a data subject rather than a dialogic partner. In doing so, it transforms the cultural politics of design, shifting agency from collaborative negotiation to algorithmic inference.

Alignment with platform capitalism—PD operates within, and reinforces, the extractive logics of platform economies (Srnicek 2016; Zuboff 2019). Prediction becomes a commodity, predictive accuracy a form of capital, and the design process itself a mechanism for the continual monetisation of human behaviour.

For Design Culture studies, this positions PD as both a symptom and a driver of broader cultural transformations in the algorithmic age.

6.1 Predictive Design in Practice

Understanding PD as a cultural formation also requires unpacking its technical and methodological foundations. PD may foreground the epistemic and cultural implications of designing through prediction, but it is built on a set of established practices that make such prediction operational. Chief among these is data-driven design (6.1.1.), which provides the infrastructures, workflows, and feedback loops for collecting and interpreting behavioural data at scale. Yet PD also incorporates the statistical modelling and machine learning techniques of predictive analytics (6.1.2.), the behaviour-shaping strategies of predictive user experience (6.1.3.), and the proactive, decision-making logics of anticipatory design (6.1.4.). Together, these interconnected approaches furnish the analytic capacity, operational mechanisms, and interface paradigms that allow PD to function. By clarifying these conceptual and methodological relationships, the seemingly neutral processes of data collection, analysis, and optimisation become the enabling conditions for the anticipatory, behavioural-shaping ambitions of PD.

6.1.1 *Data-driven design*

Data-driven design (DDD) is an umbrella term for design practices where data scientific techniques heavily inform decisions. The growing recognition of data science's potential in design and development is evident among both practitioners and researchers (Kim et al. 2016). Trauer et al. (2020) define DDD as "a framework for product development in which the goal-oriented collection and use of sufficiently connected product lifecycle data guides and drives decisions and applications in the product development process."

Data may come in many forms, such as natural language processing of reviews and social media, surveys, market research activities, historical transaction data, analytics of use phase data, and real-time data streams (such as location tracking and viewing time). Cantamessa et al. (2020) argue that data-driven technologies are triggering a paradig-

matic shift in product design which is characterised by the continuous integration of real-time data from both users and production systems, fundamentally altering the roles of designers and how artefacts are conceived and developed.[13]

How can PD be conceptualised in relation to DDD? We argue that data-driven design is the technical and operational substrate of predictive design. While DDD maps the transformation of design through data, PD examines the ontological, ethical, and epistemological consequences of this shift—particularly the transformation of human subjects into anticipatable, optimisable profiles within total design environments.[14] The notion of PD therefore goes beyond the practical use of anticipatory design methods, aiming to critically expose and question the underlying assumptions of these practices from both the designer's and the user's perspective.

6.1.2 *Predictive analytics*

Another, related field is predictive analytics, a discipline in data science focusing on the use of statistical algorithms and machine learning methods to identify patterns in large datasets and predict future events or behaviours (Kumar et al. 2018; Panda and Agrawal 2024). In the context of design, predictive analytics might be used to infer a user's personality traits from their digital footprints (such as IBM's Watson Personality Insights), or to predict what content a user will find engaging.

In the PD paradigm, designers leverage these analytics to shape user experiences and to decide what should be designed and how. This move from prediction to suggestion is a characteristic of prescriptive analytics—a technique enabled by AI—which not only forecasts likely outcomes but also proposes actions to achieve them (Trauer et al. 2020).

6.1.3 *Predictive user experience*

Predictive User Experience (predictive UX) is a relatively recent concept (Nwasra et al. 2025) that refers to methods aimed at anticipating and responding to users' needs before they are explicitly articulated. By integrating data-driven insights and predictive analytics into the design process, predictive UX enables the proactive delivery of relevant content, services, or interactions—often in real time—while minimising friction in the user journey. Personalisation, optimisation and (churn) prediction are the key benefits of predictive UX methods (Lau 2024).

6.1.4 *Anticipatory design*

Anticipatory design (AD) is an emerging approach in the field of predictive UX. The term refers to interfaces and systems that leverage AI and machine learning to proactively make choices to "reduce the cognitive load of users by making decisions on their behalf" (van Bodegraven 2017). Aron Shapiro—founder of the design agency Huge—has introduced

[13] *Designers today work within complex socio-technical systems alongside engineers and data analysts, requiring new competencies and organisational structures. Artefacts themselves become dynamic, adaptive systems, blurring boundaries between design, use, and iteration. As a result, design agency is redistributed, and traditional linear design models give way to fluid, data-centric processes.*

[14] *Total design environments refer to socio-technical systems in which user activity, interface interactions, and service delivery are integrated into a single, continuous feedback loop of observation, prediction, and optimisation. Such environments collapse the boundaries between interaction, data collection, and behavioural modulation, making design inseparable from surveillance and control. Examples include platform ecosystems like Google (search, Gmail, Maps, YouTube), Facebook/Meta (News Feed, Instagram, WhatsApp), and Amazon (retail platform, Alexa, Prime Video), where every user action is both a service interaction and a source of predictive data feeding back into the system's design.*

the concept as a user-centred approach to reducing decision-fatigue in digital environments. As he explains, "The goal is not to help the user make a decision, but to create an ecosystem where a decision is never made—it happens automatically and without user input. The design goal becomes one where we eliminate as many steps as possible and find ways to use data, prior behaviours and business logic to have things happen automatically, or as close to automatic as we can get." (2015). AD thus exemplifies a practical application of predictive technologies within user experience, aiming to streamline decision-making through automation.

However, while AD reflects *what* is being designed—namely, interfaces that act on behalf of the user—PD shifts the analytical lens to a broader level. The key distinction between PD and predictive UX methods such as AD lies not only in scope—methodological versus theoretical—but also in their orientation. While AD focuses on what is designed, PD interrogates how and why design itself is being reshaped under the logic of prediction. PD thus serves as a broader design cultural framework that encompasses not only the design of anticipatory systems, but also the design of the epistemic, infrastructural, and cultural conditions under which anticipation becomes possible.

7. IMPLICATIONS

In what follows, we outline two central lines of critique that expose how PD departs from the foundational values of HCD and reconfigures the role of design in algorithmic culture: first, the erosion of participatory design values; and second, the emergence of user-centredness as a guise for data-driven surveillance.

7.1 Erosion of Participation

We argue that the participatory ethos of HCD is being undermined, since predictive design methods—aligning with the exploratory mode of knowledge production—privilege statistical correlations over causal understanding. While HCD emphasises qualitative engagement, co-creation, and user agency, contemporary UX practices increasingly rely on behavioural analytics—as we pointed out in Google's and Facebook's cases. This shift risks narrowing the imaginative scope of design, steering it away from speculative, critical inquiry toward the optimisation of existing behaviours (Schneider 2025). In this data-centric paradigm, even granular decisions—such as a button colour or the size of a border—often require validation through metrics (Hern 2014; Hurst 2021). This reliance on data risks marginalising a "more enlightened view of people" (Norman and Draper 1986, 25–26) and may gradually hollow out the democratic, participatory ethos at the core of HCD[15].

Earlier in this paper, we outlined a spectrum of user involvement in HCD, ranging from *design by users* (maximizing user autonomy) through

[15] *It is important to recognise that what people want and what they do often diverge—a phenomenon known as the "intention–behaviour gap" (Sheeran and Webb 2016). Relying solely on behavioural analytics risks privileging observable actions over users' articulated intentions and higher-order goals, potentially obscuring the deeper needs and values that should inform design.*

design with users (collaborative co-creation) to *design for users* (designers acting on behalf of users). PD reinterprets this spectrum in a way that challenges and complicates its original participatory intentions.

While PD inherits the *for users* orientation of late-stage HCD—where design decisions are often justified by claims of user benefit—it replaces much of the interpretive, qualitative grounding of that position with inference from behavioural data. In effect, the "user" becomes less a dialogic partner or co-creator and more a data profile whose likely actions can be modelled, anticipated, and optimised for.

At the same time, PD borrows selectively from the *with users* end of the spectrum, but here "participation" often takes the form of involuntary data contribution rather than active collaboration. Every click, scroll, or dwell time becomes input into predictive systems, generating design-relevant knowledge without the explicit consent, awareness, or agency typically associated with co-design.

Finally, the *by users* pole—the domain of Meta-design and end-user development—finds an ambiguous place in PD. While predictive systems can, in theory, adapt to user-led configurations or emergent practices, the underlying predictive infrastructure often constrains these possibilities, prioritising behavioural pathways that serve platform-level optimisation goals.

Viewed through this reframed spectrum, PD signals a structural shift: it maintains the rhetorical language of human-centredness but redistributes agency toward algorithmic systems and corporate interests. The result is a mode of design where "for users" is subsumed into "through users," and where the primary medium of user involvement is their ongoing transformation into predictive data subjects. This marks a shift toward a paradoxical form of (predictive) participation—where users shape systems through their data traces, but without the awareness, consent, or influence traditionally associated with participatory design.

7.2 Service as Surveillance

Second, we argue that the rhetoric of user-centredness often obscures the underlying logic of large-scale behavioural surveillance. While "seamless interaction" and "intuitive interfaces" are framed as empowering design choices, they frequently serve to normalise data extraction and algorithmic profiling. Concepts such as efficiency, usability, and accessibility are used to frame systems participatory and human-centred (e.g. Meta), even though these systems often rely on the large-scale capture of behavioural data—not merely to enhance user experience, but to predict, influence, and monetise user behaviour. As Shoshanna Zuboff (2019) argues, this data is treated as a surplus resource, feeding predictive models that are sold into "behavioural futures markets"[16]—a logic that exceeds UX optimisation and enters the realm of behavioural

[16] *Zuboff's "behavioural futures markets" are places where companies sell predictions about what people will do in the future. They collect huge amounts of data about user behaviour (what we click, where we go, what we say), turn it into predictions (e.g., "this person is likely to buy X tomorrow"), and then sell those predictions to advertisers, insurers, political campaigns, and others who want to influence or profit from our future actions. It is like a stock market, but instead of trading shares of companies, they trade bets on people's future behaviour. (Zuboff 2019, 96)*

modification for profit. In this context, design does not foster agency or critical engagement, but rather renders behaviour more computable, and monetisable. Thus, in the PD paradigm, services are motivated to improve data collection, essentially creating a feedback loop between design and data. Better data allows for more accurate predictions, which can improve design decisions, and at the same time, the design of a system affects the kind of data it can collect and how reliable that data is. Products and services within the predictive framework are thus designed to encourage user engagement and continuous data generation. Seamless interaction—as a core principle of UCD—plays a major role in this process. Miriam Rasch (2020) argues that seamless interaction is "an important dogma of dataism" because it reinforces the notion that design should recede into the background, enabling continuous, passive data flows unimpeded by user resistance or reflection. The optimisation of design for data-capture is clearly reflected in the shift from prioritising standalone, offline products to developing online services, subscriptions, and product ecosystems (Bürdek 2015, 9). By transitioning to cloud-based services, companies are able to exert long-term control over user engagement and data.

However, under the banner of understanding and serving the user, tech companies often overreach in harvesting personal data. For instance, as shown in multiple investigations, Google collects location data even when users have explicitly disabled "Location History" in their settings. According to the company's spokesperson, "There are a number of different ways that Google may use location to improve people's experience, including: Location History, Web and App Activity, and through device-level Location Services." (Nakashima 2018). Yet the use of this data extends far beyond enhancing user experience—it feeds into Google's advertising ecosystem, allowing hyper-targeted marketing based on physical movements, routines, and behaviours.

At the same time, there are limits to how fully this extractive logic can appropriate human life, for prediction is bound to what can be computed—an assumption that, as Dunne and Raby (2013, 39) remind us, leaves much of the complexity of human experience outside the frame of design: "Dark, complex emotions are usually ignored in design; nearly every other area of culture accepts that people are complicated, contradictory, and even neurotic, but not design. We view people as obedient and predictable users and consumers." PD amplifies this reduction by treating human action as fully legible through platform-specific datasets. But no database can account for the contradictions, discontinuities, or off-platform practices that constitute real human life, which means that prediction necessarily operates on partial, biased, and often misleading portraits of users. Acknowledging this epistemic shortfall is essential: the very incompleteness of data is not an accidental flaw but a structural condition that constrains predictive design methods.

In the era of *surveillance capitalism*, as described by Zuboff, corporations claim human experience as "raw material" without users' full awareness or consent. This business model, pioneered by internet giants, turns HCD on its head: instead of empathetically serving the user, it treats the user's behaviour as a product to be sold. The rhetoric, however, often claims it's all to enhance user experience. This underscores a modern tension: the same user data that can improve a service's usability can also erode privacy and autonomy if misused.

Zuboff's critique is not merely economic but ontological: surveillance capitalism enacts a transformation in how the human is conceptualised and operationalised within digital systems—PD, in this context, is not simply a set of design tools and ideas, but a critical concept that names and interrogates this transformation.

8. CONCLUSIONS

Throughout this paper we have traced how PD emerges from the technical and methodological infrastructures of data-driven design, predictive analytics, predictive UX, and anticipatory design. We have situated PD historically, showing its roots in the rationalisation and optimisation logics of modern design, its methodological debt to HCD, and its current embedding in platform capitalism. We have also located it conceptually within design culture studies, emphasising that PD is more than a toolkit—it is a cultural formation that reconfigures the relationship between designers, users, and systems.

By reframing the "design by/with/for users" spectrum in predictive terms, we have shown that PD complicates the participatory ideals of HCD. "For users" becomes "through users," as their interactions are continuously harvested and fed back into systems that anticipate and steer behaviour. Participation is often reduced to passive data contribution; agency is redistributed toward algorithmic decision-making; and design itself becomes a mechanism for maintaining the conditions of further data capture and optimisation.

This analysis also underscores the dual nature of PD. On the one hand, predictive techniques can enhance efficiency, personalisation, and responsiveness across domains from healthcare to education. On the other, they embed new asymmetries of knowledge and power, normalising surveillance, constraining user agency, and narrowing the imaginative scope of design to what is already probable. In doing so, PD not only changes the mechanics of design practice but also contributes to the shaping of a broader algorithmic culture—one in which the governance of futures is increasingly delegated to computational systems.

What is at stake in the rise of PD is not simply how design is done, but what design is for—and for whom. PD marks a shift in the cultural, epistemic, and political economy of design: from processes grounded in

dialogue, speculation, and participatory engagement toward systems oriented around behavioural forecasting, optimisation, and extraction. While drawing on the rhetoric of human-centredness, PD redefines the role of the user—from an active participant in shaping outcomes to a predictive data subject whose past behaviours are leveraged to model, anticipate, and monetise future actions.

Like all conceptual work, this study has its limitations. Our analysis is primarily theoretical and interpretive, drawing on a curated set of historical, theoretical, and cultural sources rather than on systematic empirical data. While this allows for a broad, critical framing, it also means that the nuances of PD's operation in specific industries, geographic contexts, or cultural settings remain underexplored. Additionally, our focus has been on large-scale, corporate platforms—often the most visible and influential examples—but this emphasis risks overlooking alternative or counter-examples in smaller-scale, activist, or public-interest design contexts.

These gaps point toward several avenues for further research. Empirical studies could investigate how predictive design logics are implemented, adapted, or resisted in different sectors, from civic technology to education, healthcare, or cultural institutions. Comparative research could explore variations across regulatory environments or cultural contexts, highlighting how legal frameworks, societal values, and local practices mediate the adoption of predictive techniques. Finally, speculative and critical design methodologies could be employed to prototype alternatives—systems that use predictive capacity to enhance rather than diminish participation, agency, and plurality.

By locating PD within the interdisciplinary framework of design culture studies, we have aimed to contribute to a critical vocabulary for examining how contemporary design mediates power, participation, and knowledge in the digital age. PD is not merely a methodological evolution; it is both a symptom and a driver of a changing cultural paradigm. As such, it is also a site of contestation—raising urgent questions about how design might reclaim spaces for openness, critical engagement, and the co-creation of alternative futures beyond the imperatives of prediction and optimisation.

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CYBERNETIC MODERN DESIGN IN EMERGING POST-FORDISM

SYSTEMS THINKING, INDUSTRIAL TRANSFORMATION, AND THE LOGIC OF FLEXIBLE ACCUMULATION

Sándor Őze

ABSTRACT

The article investigates how early cybernetics shaped late modern design within the broader transformation from Fordist mass production to post-Fordist regimes of flexible accumulation between 1945 and 1975. It argues that transformations of capitalist production regimes constitute a necessary framework for analysing the designed environment. Part I outlines Norbert Wiener's cybernetics as an interdisciplinary methodology emerging from the Fordist military–industrial production, highlighting its implications for automation, networked infrastructures, and information-based conceptions of economy and labour. Part II examines two Bauhaus successor institutions—the HfG Ulm and The New Bauhaus/Institute of Design—to show how cybernetic concepts informed the shift from object-centred to systems-oriented design, redefining the designer as a coordinator of complex socio-technical networks. The article argues that cybernetics simultaneously expanded design's methodological repertoire and integrated it more tightly into industrial rationalisation and flexible production, while also contributing to the depoliticisation of modernist utopias by reframing political and social projects as technical problems of control, communication, and optimisation.

#cybernetics, #flexible accumulation, #post-Fordism, #depoliticization, #systems thinking

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One of the most inspiring and—by now classical—associations in the history of technology is the parallel drawn between the Golem of the sixteenth-century Prague ghetto and the computers of the twentieth century. The interpretive overlap between Rabbi Loew's clay creature and programmed automata is most directly linked to Norbert Wiener, the father of cybernetics, and Gershom Scholem, the most significant twentieth-century scholar of Jewish mysticism. While Wiener (1966) employs the Golem in *God and Golem, Inc.* merely as a means of situating cybernetics and religion within a shared conceptual framework, Scholem—speaking in 1965 at the inauguration of Israel's first computer, named "Golem"—develops the analogy, analyses the sources of the Golem legend, and finally, through six questions and their discussion, "pits" the new Golem against the old one. The fourth of these questions broadly covers the subject matter of the present study: "Can the new Golem grow in stature and productivity? He certainly can, although with growing productivity we rather expect the Golem of Rehovoth [the new Golem] to shrink in size and to take on a more attractive and becoming exterior." (Scholem 1966, 62).

Although Scholem's question is not devoid of irony (he suggests the new Golem is clumsier than the old one), it nevertheless directs attention to a highly significant issue: the relationship between the design of a technology and its productive capacity.

CYBERNETICS AND LATE MODERN DESIGN

At some distance from the Golem analogy, this study investigates that relationship within a historical framework, between 1945 and 1975. Its primary working hypothesis is that the historical transformation of capitalism—in this case, the post–World War II restructuring of the production regime (from Fordism to the post-Fordist system of flexible accumulation)—constitutes a necessary point of departure for the analysis of our designed environment. From this perspective, I examine the influence of the early years of cybernetics on postwar modern design.

The interweaving of cybernetics and modern design is a well-studied field (Oswald 2012; Doblin 1974; Medina 2012; Krippendorff 1979; Fischer and Herr 2019) to which this study contributes an understanding of how cybernetics facilitated the integration of post-war modern design into the industrial structure of late capitalism. My aim is to demonstrate

how, during the 1960s and through the impact of Macy-period cybernetics, modern design came closer to the emerging networked industrial structure and, through it, to the production regime based on flexible accumulation (Harvey 1989). Put briefly, I ask how cybernetics facilitated the integration of post-war modern design into the industrial structure of late capitalism. My central claim is that the impact of cybernetics on design simultaneously expanded the practice and conceptual horizon of design, while also adapting it to the logic of industrial production, rationalizing and consolidating its visions of the future as well as its (diverse) political ambitions.

The study is divided into two parts. Part I introduces the key concepts of cybernetics and outlines its brief history, with particular attention to its effects on regimes of production. I investigate how flexible production already appeared in cybernetic research in the 1940s, thereby laying the foundation for the post-Fordist economic paradigm that became globally dominant in the 1970s.

Part II examines the relationship between post-war modern design and cybernetics. Here, I analyse the presence and influence of cybernetics in two post-Bauhaus institutions. I attempt to reconstruct the process by which late-modern design shifted towards systems design, both aligning with and, in part, anticipating the post-Fordist paradigm of the latter half of the twentieth century.

PART I

Frameworks

Cybernetics is difficult to approach. It is effectively a constellation of fields with continuously shifting frameworks and multidisciplinary aims. Its object can be research itself, tools, products, and general models for producing them. Its scale is unbounded: certain branches strive to understand cellular-level systems, while others think quite literally on a cosmic scale. It may be defined as an autonomous scientific discipline, a methodological approach, an intellectual movement, or a praxis. It can be interpreted as a bygone Cold War tendency and as a still-active and current organising force that established the basic logic of contemporary technology (Turner 2008).

To approach the history of cybernetics more closely, it must be restricted within reasonable limits. In the following, I will therefore briefly summarise not the specific research and results of individual branches of cybernetics, but rather the basic concept first defined by Norbert Wiener in 1946.

Why cybernetics? Although cybernetics exhibits numerous personal and historical overlaps, as well as conceptual convergences, with other system-theoretical endeavours of the second half of the twentieth century (such as general systems theory), this study focuses exclusively on early cybernetic research and identifies it as a formative force in post-war modern design. This necessarily reductive gesture not only keeps the scope

of the article within reasonable limits, but also reflects the fundamental differences between cybernetics and other theoretical constellations that developed partly in parallel with it (Umpleby and Dent 1999).

Among the various twentieth-century attempts to model systems, cybernetics stands out through its practical applications and its direct connection to information technologies and the emergence of digital design (Gergely 1979). Its technology-oriented perspective, attention to the interrelations of biological and mechanical systems, and concern with understanding automatic processes link it more closely to the history of post-war modern design than theoretical approaches that primarily aim to model relations among systems rather than their internal operations.

The post-war context of modern design is fundamentally shaped by its relation to industrial automation and by the adoption of emerging digital technologies as design methodologies. These constitute the principal areas in which cybernetics and modern design become intertwined.

I do not consider cybernetics a hard science, but rather as an intellectual formation, a culture-shaping force that created a general language and methodology for understanding systemic interrelations across numerous scientific domains. I will focus here on the early years of (first-order of) cybernetics, as defined and established by Norbert Wiener and his closest colleagues at MIT. The inquiry begins with the emergence of the concept of cybernetics in 1946 and ends in the late 1970s with the understanding that, given the nature of the concept, any end date can only be tentative.

About Cybernetics in General

"Cybernetics is the science of control
and communication in the animal and the machine."
—Norbert Wiener, *Cybernetics: Or Control and Communication in the Animal and the Machine*

The cybernetician engages in activities that may have biological, mechanical, physical, and social aspects. The aim of early cybernetics was to establish a universal methodology and scientific language that could make visible the commonalities among otherwise separate disciplines. Accordingly, cybernetics may appear in biology, analysing the automatisms of the human body such as neural networks or reflex systems; at the level of technological systems, in the description and design of automatic control systems, industrial infrastructures, robots, or computers; or at the level of social systems, where communication processes or the role of larger information networks come to the fore. Cybernetics thus serves as a bridge between the natural sciences, the technical sciences, and the social sciences since it seeks common, generalisable principles across different types of systems—such as the flow of information, mechanisms of control, and the structure of systemic processes in general.

Cybernetics is therefore an approach with its own methodology that situates the study of living and non-living systems within the same logical framework. By its very nature, it is interdisciplinary. Accordingly, it has been an international, collaborative scientific project —even though its two most significant trajectories, American and Soviet, with their institutional and network centres, could only function in relative isolation from one another.

The concept, by definition, entails a very broad frame. Through the institutionalisation process of early American cybernetics, we may come somewhat closer to understanding its general character. This process is in fact precisely datable.

American Cybernetics

The central figure of the American branch of cybernetics, and the one who gave the science its name, was Norbert Wiener. Between 1911 and 1944, Wiener participated as a theoretical mathematician in a series of science methodological discussions held at Vanderbilt Hall organised by scientists from Harvard Medical School. The explicit aim of these conversations was to illuminate blind spots that arose at the boundaries between specialised sciences and that could not be addressed within their own limited toolsets. The climate that emerged at Vanderbilt Hall foreshadowed the later work organisation of cybernetic research institutes: horizontal hierarchies and flexible collaboration across disciplinary divisions.

The Second World War was the most powerful catalyst for the institutionalisation of cybernetics. The US government established the Office of Scientific Research and Development (OSRD) to coordinate laboratories and research projects providing the scientific foundations for wartime armament. The OSRD was headed by electrical engineer Vannevar Bush, Wiener's close colleague at MIT. As the central financing body linking the academic and military spheres from 1940 onward, the OSRD was crucial; Bush, as a member of the National Defence Research Committee, reported directly to Roosevelt. The largest institutional support went to MIT. Among the OSRD's most important research centres was the Radiation Laboratory (RAD LAB), devoted to radar development and the military exploitation of microwave technology (Turner 2008, 24–25). It was in this environment that Wiener and Julian Bigelow began designing the first applied cybernetics project: an automatic, radar-guided anti-aircraft weapon, part of the Churchill-initiated Tizard Mission.

Why would mathematicians design a weapon, and why could such a weapon constitute the first project of a science aiming to establish a universal language?

Wiener and his research group developed predictive algorithms to calculate aircraft trajectories and future positions. These measurements had to be integrated into a mechanical system that operated

the weapon. For the automated anti-aircraft system to function properly—the synchronisation of the predictive algorithm, radar, aircraft, and bullet's velocity—collaboration among diverse specialists and a shared language were required. Wiener and his colleagues realised that the weapon's automatisms had to be derived from basic human physiological mechanisms of manual targeting. This insight led to the involvement of physiologists such as Arturo Rosenblueth, and to the transfer of models from control engineering into technological systems, most importantly the feedback loop and homeostasis. These became fundamental concepts of cybernetics.

Beyond its function as a shared linguistic framework, the feedback model occupies a central role in cybernetic thought. It enables artificial and natural systems to be interpreted within a single conceptual frame. The significance of this lies not merely in their common description, but in the establishment of a shared logical foundation through which human–machine interaction or ecological–social entanglements can be understood as components of integrated systems. Feedback thus operates not simply as an analogy, but as the most elementary formulation of a technological–social–natural systems perspective—a minimal structural schema that helps to blur the boundary between the interpretation of artificial and natural entities. In postwar modern design, this unified interpretation of designed and natural elements becomes a defining element of the technological imagination.

The very name cybernetics refers to feedback loop and to its roots in control engineering. Derived from the Greek *kybernētēs* (helmsman/governor), it denotes the field of self-regulation and information theory. The relation between a helmsman, the wheel, and the rudder provides one of the earliest and simplest demonstrations of a feedback loop: the helmsman adjusts the wheel in response to the ship's deviation from course, thus altering its future state. In a dynamic system, the system output (the information that the ship is turning in the wrong direction) feeds back into the system input (the helmsman), which changes the future state of the system (corrects the rudder). Wiener and his colleagues also applied the general model of the feedback loop to describe the basic situation of the anti-aircraft gun, enabling the same problem to be presented in a common theoretical model to all participants in the research, even though they spoke different professional languages.

Cybernetics thus emerged as the science of information-based regulation of complex, dynamic systems. The anti-aircraft project not only illustrates the emergence of general models, shared languages, and interdisciplinary research, but also reflects cybernetics' most fundamental idea: that most phenomena can be interpreted as complex systems with biological, technological, and even social subsystems. These systems—often capable of self-regulation—can be known, described, modelled, created, and controlled. Just as Wiener and his colleagues

conceptualised both the automated weapon and the enemy pilot as interlinked subsystems of a larger bio-electro-technical system, a few years later researchers would interpret neural processes, industrial production lines, networks of humans, animals, and artifacts, even national economies and power relations, within the same systemic framework. In the two postwar decades, these ideas were institutionalised through deliberate, expanding networks of interdisciplinary collaboration, the positioning of cybernetics across university systems, and the financing of its advances by the technological industries most able to exploit them.

The Total Position of the Cybernetician

According to Wiener, science has fragmented into specialisations since Leibniz. Few would claim to be simply a mathematician, physicist, or philosopher without specialisation (Wiener [1950] 1989, 15). Yet to illuminate blind spots left by disciplinary science, collaborative, transdisciplinary methods are necessary. The basic precondition is to treat problems as interconnected systems and to employ a general language and methodology equally applicable to a society or a frog's brain.[1] Only the components and structures differ; the tools of description and understanding remain the same.

The starting point of cybernetics, then, is the "total position" of the researcher: a knower, describer, controller, and designer of the comprehensive systems that constitute reality. This role, like that of Llull, Pascal, or Leibniz (the "patron saint" of cybernetics, Wiener 1948), extends to the creation of "thinking machines." The cybernetician is the possessor of a holistic knowledge, conceiving the world as a biotechnical structure, an information network, a dynamic system. The ideal artifact produced by such a figure is the cybernetic system: a biological or technological (or hybrid) system capable of feedback-based self-regulation. In Wiener's technophilosophy, a human being, a machine, a state, or even a continent can each be understood as cybernetic systems of different complexity. ([1950] 1989, 8–12)

Cybernetic Production Alternatives in Fordist Technology Development

As noted earlier, the history of cybernetics cannot be separated from American military-industrial research. The organised, institutional framework of the field, its first projects, and its earliest dedicated studies were funded and commissioned by the OSRD under Vannevar Bush. This is significant not only for the micro-history of cybernetics or American technopolitics, but also for embedding the field within broader economic processes.

If we emphasise the catalytic role of military research within Fordist production regime(s), cybernetics can be interpreted as part of an apparatus whose transformations shaped the structural transformation of production in twentieth-century capitalism. In the American case—home both to Fordism and to the dominant stream of cybernetics—wartime mobilisation and the associated state interventionism ("military

[1] *"What the Frog's Eye Tells the Frog's Brain?" (Lettvin et al. 1959) is historically important cybernetic research. It describes how vision is not a passive recording of stimuli but an active process of information selection. (Frogs have bug detectors!) Preprocessing within the retina, a finding of major significance for cybernetics—raising the question of whether the processing of information in machines and living systems might be governed by similar principles.*

Keynesianism") fundamentally determined the postwar character of Fordism. Between 1939 and 1944, the central instrument of recovery from the Great Depression was military production, during which the state extended control even over research previously detached from direct state authority (such as university laboratories) (Roberts 2016, 32–34). This was particularly true in sectors tied to military high technologies: nuclear research, radar, industrial automation, electrical engineering, and telecommunications. The leading figures of early cybernetics (Bush, Wiener, John von Neumann, Bigelow, and Ashby, among others) all worked in these industries (Wiener 1989 [1950], 15–28).

Cybernetics played a formative role within these sectors: it created shared languages and methods for technological design, enabling collaborative divisions of labour in a military-industrial apparatus otherwise dense with formal hierarchies. Beyond providing the linguistic and methodological basis for horizontal technological development, cybernetics was, by the late 1940s, already engaging questions of production-system optimisation, particularly in relation to industrial automation. Its modes of operation, and diverse conceptualisations of industry and production nonetheless shared certain defining features: industry was understood as a network of productive systems; labour was envisioned in decentralised frameworks; and economic processes were conceived as information-based structures (Turner 2008, 26–32).

The significance of these conceptions lies in their historical timing: even during the most productive period of militarised Fordism, with its reliance on assembly lines and state intervention, elements of flexible, project-based organisation and decentralised, automated industrial processes had already appeared in embryonic form in the network of cybernetic research institutions.

Cybernetic Logic and Flexible Accumulation

The perspective of cybernetics became embedded in economic, social-organisational and managerial discourses during the two decades following World War II (Franklin 2015, 39–89). The direct extension of *cybernetic logic* (Franklin 2015, 43; Tiqqun 2020, 51–60) to economics, the human sciences, and the social sciences began at the Macy Conferences (1941–1960), the most significant interdisciplinary conference series in the institutional history of cybernetics. In *Control—Digitality as Cultural Logic*, Seb Franklin (2015) undertakes a brief discourse analysis of these conferences, reconstructing the ideological stance and polarisation of early cybernetics. He goes on to critique the social applicability of cybernetic logic and its core models in the following terms: To grasp economic behaviour as functioning at the same level as instinctive reaction to stimuli is to uphold the classic assumption of liberal political economy—namely, that humans are intrinsically economic. To posit this economic being as (1) productive of homeostatic self-regulation across entire social systems and (2) requiring the construction and maintenance of a set of social, educational, and political (that is, epis-

temic) norms that valorise communicational exchange while rendering noncommunication aberrant is to add a "neo-" to this socioeconomic liberalism. (Franklin 2015, 50)

Beyond the critique of the fundamental question, Franklin identifies an important fracture among participants along two distinct lines of economic approach. One group of cyberneticians (including John von Neumann, Leonard Jimmie Savage, Paul Lazarsfeld, and Walter Pitts) shared a general "economic" perspective that pushed the individual, human dimension into the background, while the other group (Norbert Wiener, Warren McCulloch, Gregory Bateson) located the social application of cybernetic logic precisely in its critique of this reductionist economic view.

According to Franklin, this division fundamentally determined both the economic embeddedness and the ideological polarisation of cybernetics:

> *The contours of this basic opposition are illuminating if one seeks to track the intensification of the relationship between cybernetics and capital that developed through the second half of the twentieth century. The fundamental differences between two valences of cybernetics—one appearing as a stage in capital's expansion toward the informatic mode of real subsumption and one—perhaps naively—posited as incompatible with capitalist modes of production and social organisation—can be illustrated through two focal points in the opposed perspectives that emerged in the cybernetics group: the first concerns the relationship between games and social activity in general, and the second is centred on the depth to which computational metaphors for the human can be extended.* (Franklin 2015, 51)

Taking stock of the milestones of early cybernetics and summarising its economic outlook and its visions of production, we find ourselves faced with the defining criteria of post-Fordist flexible production (Boyer and Durand 1997, 11–18). Cybernetics emerged within the context of Fordism (specifically in the military-industrial sector), and one of its most significant aims was the construction of alternatives to Fordist manufacturing technologies (notably automated production). Participants in production worked in projects, under flexible contractual relations with employers; they conceived of labour activity, its object, and the act of design itself as information networks. The nature of labour was based on specialised knowledge that extended beyond national borders, operated within global institutions, and took shape using industrial infrastructures connected with those institutions.

The macroeconomic and social vision of cybernetics, moreover, was closely aligned with neoliberal economic philosophies: although polarised, it nonetheless built upon the classical liberal ideal of *homo economicus*, supplementing it with the notion of a self-regulating and perpetually existing (homeostatic) economy and with institutions whose function was the maintenance of communicational exchange.

Cybernetics was thus a technological and managerial catalyst for the emergence of a flexible regime of production. Through its new models of industrial organisation and economic management, as well as the establishment of the basic languages of digitalisation, cybernetic research laid the foundations for the design and work-organisation methods of contemporary technological industries. This microelectronics-based sector continues to determine the technological and organisational logic of the accumulation regime to this day.

PART II

Classical Modernism and Cybernetic Logic: Two Examples

Although cybernetics only became an established field with institutions and representatives during World War II, the concept can retrospectively be extended to systems that reflect its basic logic. In its broader usage during the 1940s, Wiener and his collaborators were able to connect early cybernetic research to existing scientific results and to integrate already developed concepts into their own interpretive framework (Wiener 1948).

The techno-utopian branches of the classical avant-garde in the early twentieth century created, across a wide range of media, multiple variations of what can retrospectively be regarded as cybernetic systems. In the first short example below, I demonstrate the applicability of the language of cybernetics to modern design through a paradigmatic work of classical modernism. In the second example, I present the appearance of cybernetic logic and subject matter in another widely known work.

László Moholy-Nagy's *Telephone Pictures* (1923)

The concept of the *Telephone Pictures* is simple: the designer telephones an enamel factory, and a factory worker answers. Moholy-Nagy dictates the colour codes and coordinates, and the worker, using the painting machine, produces the line composition and its variations.[2]

This process, described with the tools of cybernetics, may be represented as a negative feedback model (fig. 1).

[2] *László Moholy-Nagy explained the making of the Telephone Pictures within this framework in 1944. Whether the works were in fact produced in precisely this manner remains uncertain. In* Moholy-Nagy: Marginal Notes, Documentary Absurdities (1972)*, his first wife, Lucia Moholy recalls that the artist personally went to the factory. Regardless of the actual sequence of events that led to the production of the pictures, I take Moholy-Nagy's—presumably retrospective—narrative as my point of departure.*

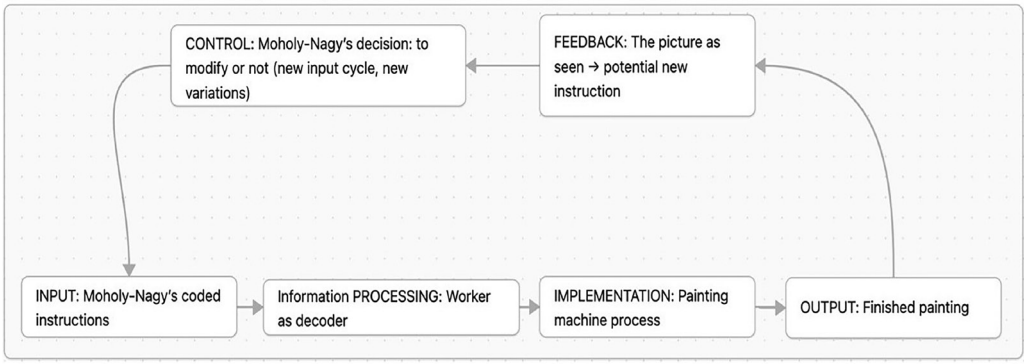


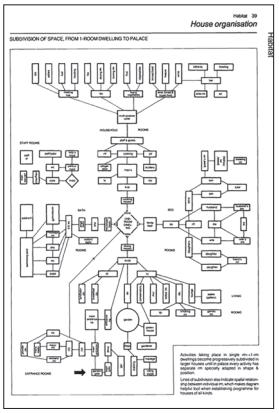
FIGURE 1. *Formation of telephone picture variations in a negative feedback model.*

Describing the work with cybernetic concepts does not reveal much since the feedback model is by definition suited to the representation of dynamic systems. What is more interesting is that through the lens of cybernetics we can model the painting, its process of creation, and its creator as a dynamic, variable biotechnical system.

Ernst Neufert: Data and Typification in *Architect's Data*

Ernst Neufert was Walter Gropius's secretary at the Bauhaus. Later, he was among the few Bauhaus members who were able to continue their design careers in Germany under National Socialism. Neufert became closely tied to the power apparatus of the Third Reich. In the second edition of his 1936 magnum opus *Bauentwurfslehre* (*Architects' Data*), the 1943 preface was written by Albert Speer. From 1938 onward, Neufert was employed by the Reich, working on the standardisation of architecture and of military-industrial infrastructure.

The starting point of *Architects' Data* is the idea that architecture and human spatial presence can be described, converted into data, and from this a universal architectural methodology can be developed. Like cyberneticians, Neufert regarded architecture and humans as a uni-



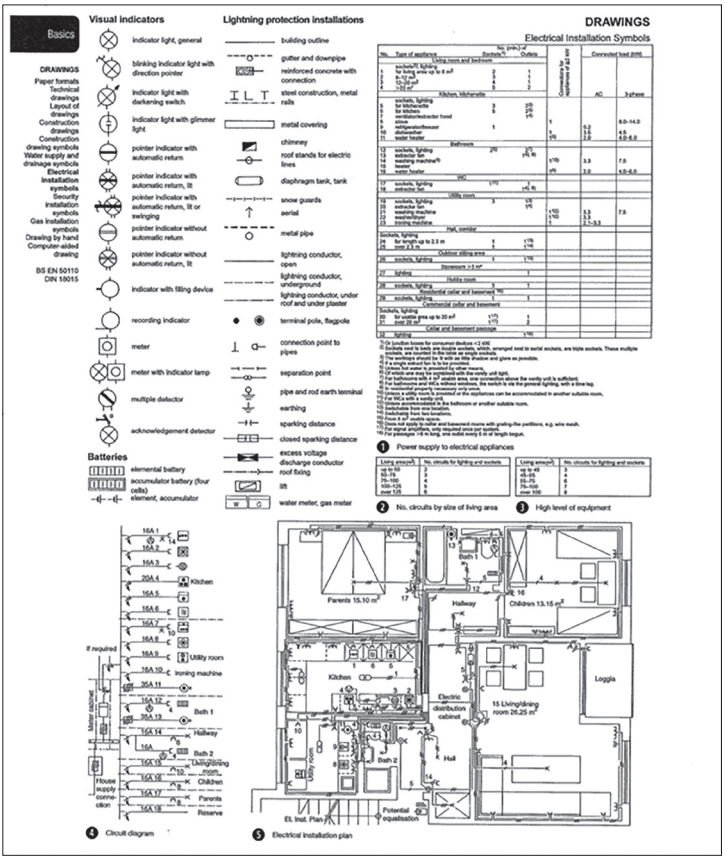


FIGURE 2. *Ernst Neufert's standardised installation symbols for a building's electrical network (left) and the subdivision of living space and specialised spatial uses in his network-based diagram (below). Adapted from Neufert's* Architects' Data *(1998).*

fied system. For example, by measuring the physiological effects of optimal room temperature, he established general design procedures and created a universal sign system. He also devised basic symbols for the general description of a building's electrical networks and created a universal measurement and data-based language which paved the way for manufacturing and design automation. Neufert's *Architects Data* is still regarded as a foundational work and can be considered an early precursor of parametric design.

The reliance on data, development of universal methodologies, and simplified modelling of complex systems are also found in the logic of cybernetics. Neufert's hyper-rational description tied to large-scale industrial technologies and oriented toward automated production reflects the mindset of the industrial rationalisation aims of the post-war era. It also resembles the system-building, language-generating position of the cybernetician in the way it encodes the human-biological and technological meta-system into a unified graphic structure.

Post-War Modern Design and Cybernetics: Two Examples

In the two decades following the World War II systems design emerged as one of the main currents of modern design. It appeared in the design-related exhibitions of MoMA, in the Bauhaus successor institutions, in the corporate design of major American multinational companies (Harwood 2011), and from the 1960s onward in the increasingly influential computer industry.

The basic premise of systems design is that a designed object does not exist in isolation but as part of a technological, social, and biological system. The development of its theoretical foundations was closely intertwined with the international expansion of cybernetics. In the following short institutional overview, I illustrate this process by highlighting two institutions most directly linked to the Bauhaus where specialised design education took place, and by briefly presenting several key figures. Specifically, I examine the emergence of the cybernetic paradigm at the Hochschule für Gestaltung Ulm and at The New Bauhaus/Illinois Institute of Design. I do so with the understanding that the full scope of its impact on students, faculty, and the functioning of education would require far more extensive institutional research.

Hochschule für Gestaltung Ulm

The influence of cybernetics appeared most visibly at the Bauhaus's German successor institution, the Hochschule für Gestaltung Ulm (HfG). The rise of semiotic and information-theoretical approaches was closely linked to the internal debates that followed the school's founding, debates that centred on the question of whether design should be defined as a scientific or as an intuitive endeavour. The conflict culminated in the resignation (and soon after departure) of Max Bill, who served as rector between 1953 and 1955. Bill would have placed the Bauhaus tradition of craft, designer-centred practice artistic heritage at the core of education,

while most of the institution's theoretical faculty members approached design and the role of the designer through the emerging sciences of information shaped by cybernetics. With the appointment of Tomás Maldonado as rector in 1956, the cybernetic approach to design became the primary focus of the curriculum (Oswald 2022).

Already in 1951, the school's anti-fascist, science- and function-centred program included a teaching module entitled "Information," which initially covered broadly defined political journalism. In connection with the conflict surrounding the design approach developing at the institution, Max Bense took over the management of the module, now operating officially as the Information Department, in 1955. This is when cybernetics became a taught subject. In the same year, Bense invited Norbert Wiener as a guest lecturer to introduce the basic context of cybernetics. The Information Department quickly developed into the intellectual centre of the school and shaped the character of practical design studies as well, emphasizing information-based design methodologies and industrial typification. Although after Bense's departure in 1958 the department lost its direct cybernetic and information-theoretical orientation and returned to the function it had served in Bill's period (journalism), cybernetics nevertheless remained an active part of the curriculum through other instructors. For instance, methodological courses by Horst Rittel and Gui Bonsiepe were taught within a cybernetic framework, and Abraham Moles—later president of the French cybernetics society—taught the social sciences (Oswald 2012; Krippendorff 2008, 63–64).

The impact of cybernetics (and of information theories based on it) at Ulm cannot be reduced to individual careers, courses, or specific objects designed at the school. Rather, it constituted one of the fundamental organising principles of teaching and institutional thought. This is evident not only in the methodological models of Rittel, Maldonado, or Bruce Archer, which laid the foundations of the school's design-educational structure (Dubberly 2004, 7), but also in the cybernetically based design theory of students-turned-instructors such as Klaus Krippendorff and Gui Bonsiepe. Cybernetics contributed to a redefinition of the role of the designer. No longer understood merely as a form-giver or aesthetic decision-maker, the designer was reconceived as the coordinator of complex systems and diverse interests. Parallel to the position of the cybernetician, the designer emerged as a "total" figure, whose central task was the control and management of the design process conceived as a system—a role inseparable from the postwar transformation of production organisation.

The post-Fordist industrial structure, in which the standardised, hierarchical, and spatially fixed logic of mass production was replaced by flexible, customizable, and information-driven production, demanded the integration of diverse expertise, manufacturing technologies, differentiated (or more precisely individualised) user needs, and new market strategies. This required a design attitude capable of organizing these system elements into a coherent whole. The cybernetically based

pedagogy and methodology of the HfG Ulm was therefore not merely an educational reform but an anticipatory response to the restructuring of the relationship between design and industry: the designer as a systems thinker and strategic integrator became one of the first professional prototypes of post-Fordism.

The New Bauhaus/Illinois Institute of Technology – Institute of Design

At the other direct successor institution of the Bauhaus, The New Bauhaus founded by László Moholy-Nagy, the perspective of cybernetics was already evident in the late 1940s, particularly in the courses of Buckminster Fuller and Konrad Wachsmann. Fuller, one of the most significant representatives of modern design at the time in the United States, developed his own system theory, focusing his work on the design of ecological and technological subsystems. His ideal designer, the so-called *comprehensive designer* (Fuller 1963, 173), was conceived as a figure who crossed disciplinary boundaries, created bridges between different forms of design activity, and coordinated design processes within a unified system. In his most famous work, *Spaceship Earth*, Fuller compares the entire planet and its ecological-social problems to an automated system of a spaceship, with the designer as the controller of biotechnical processes. Fuller lectured as a guest at Ulm, at Black Mountain College, and at MIT.

Between 1949 and 1964, Konrad Wachsmann taught at the school, where he also established his own research institute, the Advanced Building Research Division. Like Fuller, Serge Chermayeff, Moholy-Nagy, or György Kepes—just like all early cyberneticians, and numerous modern designers who emigrated to the United States—, Wachsmann participated in American military-industrial developments during the Second World War. He focused on architectural typification and the design of mass-producible modular infrastructures and building elements. After the war, he continued project-based research on state and military architectural automation, for example, for the Federal Housing Agency and the US Air Force. The Advanced Building Research Division functioned as a supporting institution for these projects. Wachsmann's work and teaching were based on cybernetic thought. The most illustrative example is the Modular Coordination Classification System (1951–52). Funded by the Federal Housing Agency, the project envisioned a general, modular, mobile information centre that could be installed in any space and that, using early punch-card technology, classified design-related information and made it easily accessible in an integrated system for designers. Wachsmann and his students built the system into an integrated desk-like furniture unit. He also imagined the organisation and content of teaching in algorithmic order—a model he later expanded, as a professor at the University of Southern California, into a cybernetic system encompassing architectural education and university structures across the United States (Isbilen 2023, 125–31).

With its merger with the Illinois Institute of Technology and its transformation into the Institute of Design (ID), the school shifted even more decisively toward systems design in the 1950s. During the transformation, the ID was directed by Serge Chermayeff, who taught continuously at leading American universities (MIT, Harvard, Yale) between 1949 and 1971, precisely when cybernetics was gaining traction in American academia. Chermayeff turned to design methodology and architectural methodology; in his *Community and Privacy* (1965), co-authored with Christopher Alexander, he examined the potential of computer technologies in architecture and urban planning. Their initial model for analysing cities in terms of changing social processes came from Heinz von Foerster, a cybernetician and originator of second-order cybernetics. Alexander's later work also reflects the influence and perspective of cybernetics, focusing on information as the fundamental element of architectural representation and on language-making. His essential book *Pattern Language* articulated a new architectural methodology and language (Alexander 1977, 9–23).

After Chermayeff's resignation, Jay Doblin became head of the Institute of Design in 1955, and under his leadership the entire curriculum was oriented toward a cybernetic interpretation of design. The school's own contemporary self-description refers to the period between 1955 and 1969 as the "system era" (Institute of Design. n.d.). This perspective is also reflected in Doblin's invitation of Ken Isaacs as a visiting lecturer in 1961, who taught his methodology of flexible, modular, homeostatic environments. The structure, which Isaacs called the "matrix," originated in a 1957 course at Cornbrook, whose required reading was Wiener's *Cybernetics* (Margolin 2002, 64–65).

Under Doblin, the Institute's educational policy was directed toward the professionalisation of design, emphasizing the industrial and economic rationalisation of design and highlighting the role of the designer—paralleling the Ulm HfG—as a system controller and manager. In his theoretical writings, Doblin used cybernetic models to describe design methodologies (e.g. information in a design-model; the design circle), linking these to the impact of increasing industrial automation on design and to the emergence of postwar flexible production. (Doblin 1985, 18–32) Perhaps most explicitly in his late essay "A Short, Grandiose Theory of Design" (1987), Doblin tied cybernetics-based design methodologies to the conditions of post-Fordist production. The models presented there sought to interpret and facilitate the design process within a structure of production where the central issue was adaptation to corporate ecosystems and industrial networks (Doblin 1987).

The developmental trajectory of the Institute of Design rooted in The New Bauhaus illustrates how modern design adapted to industrial and economic transformation. Wachsmann's modular pre-digital systems, Fuller's complex eco-technocratic visions and the position of the comprehensive designer as a managerial figure combined the holistic logic of cybernetics with the designer's role in flexible production organisation

and with the requirements of automated industrial production. In the postwar decades, the school increasingly placed design education in the service of economic and industrial integration: under Doblin, the central aim of education became the professionalisation of design and the advancement of industrial rationalisation, explicitly aligned with post-Fordist conditions of production. In Doblin's theory of design, this educational policy was articulated in the language of cybernetics-based methodological models. He also summarised the nature of economic transformation (from "Victorian repetition" to industrial automation, individual consumer culture, and the rise of the technological sector) within this framework:

> Automation is more than replacing workers with electronic controls. In production it means a shift in concept from the Victorian "repetition" machines that perform highly specific tasks to a new breed of cybernetic machines that have sensory-response capacities. These machines can sense the need for a particular product, respond by making enough of them to satisfy the demand, and vary each product to suit the demands of individual customers. The computer, the exemplification of the new breed of machines, is rapidly becoming the largest industry. (Doblin 1970, 126)

* * *

Beyond the two institutions discussed above, cybernetics appears in the careers of numerous designers as one of the central organising principles of thought and creation. Yet this study cannot aim to be exhaustive in presenting every career in modern design linked to cybernetics. Within the analysis of the field's entanglement with the postwar modern movement, however, figures such as György Kepes, Iannis Xenakis, Nicolas Schöffer, and Eliot Noyes[3] are just as indispensable as the designers and cyberneticians mentioned above.

Cybernetics as a Force of Depoliticisation in Design: Two Examples

As indicated in Part I, cybernetics is not ideologically homogeneous. We have classified early cybernetics into two major orientations in terms of applicability to socio-economic relations. On one hand, there is a form of "economic reductionism" that breaks down behaviour into information flows and optimisable decision rules; on the other hand, one finds an approach that interprets social and natural systems analogically through the basic concepts of cybernetics. The ideological divergence of the Macy Conferences is particularly significant here because this fault line is likewise identifiable in the design practices that emerged in the wake of early cybernetics. In this respect, the difference appears between design that understands systems planning/interpretation as an emancipatory social practice (A—e.g., Gui Bonsiepe and Klaus Krippendorff) and design that conceives systems planning as a tool of effective industrial rationalisation or management technique (B—e.g., Eliot Noyes).

[3] *First working in the architectural office of Gropius and Breuer, and later at Harvard and MoMA on the institutionalisation of the modern movement, Noyes then passed through the research and development laboratories of the US Air Force, and eventually became a design consultant for IBM, where he redesigned the entire information technology corporation. He developed unified interface systems for IBM computers, created the company's first corporate identity (which became the archetype of the global tech corporation), and contributed to the design of several IBM buildings as well as the company's business management strategy. Noyes's career encapsulates the full trajectory and applications of cybernetics: from the 1950s onward and in his role as designer-manager, he worked for the company under flexible contractual arrangements with his own independent team. The most distinctive element of his oeuvre lies in the establishment of the design language for the first global corporation of the information technology industry (Bruce 2006; Harwood 2011).*

In the former case (A) the language of cybernetics necessarily reduces political conflicts of interest to questions of technological infrastructure. In the latter (B), the end point of design is efficient production—which, in many cases, also includes social aspects (e.g., Konrad Wachsmann and Jay Doblin)—that is, the most extensive possible exploitation of the industrial-economic conditions of design. In both cases, the depoliticising dimension of cybernetics' deeply technocratic language prevails.

Cybernetic research focuses on the present-tense understanding and modelling of given problems. It is a mode of problem-solving that regards the task facing the designer as always describable and thus knowable. The viewpoint that the designer's primary task is to analyse, understand, and solve the problems of the existing system is difficult to reconcile with the utopian visions of modern design in the interwar period. The often hazy and at times irrational utopian future imagined by design understood as an instrument for constructing a new man and a new society and a completely new form of living does not fit into the operationalised reality of cybernetics—measured by all available means and modelled within its own system. In the case of cybernetic design, the transformability of the future is derived from the understanding and control of total systems. Cybernetics (and the systems theories that emerged from it) provided the theoretical foundations of systems-oriented design and preserved the conception of a designer figure as total as the utopian constructor of the early radical modernists while simultaneously displacing its explicit political content. In the two decades following the World War II, the comprehensive designer calibrates, options, calculates; the human being is seen as a user, and the use of the designed object is viewed as a unified biotechnical feedback loop composed of human–machine inputs and outputs. This perspective differentiates, for example, Buckminster Fuller's flying city design from Georgii Krutikov's flying city project. In Fuller's Cloud Nine (1960), the focus is on the technology of flying geodesic domes and a vision of a utopian technology. The designer asks what possibilities there are for solving the detected eco-crisis through the technology he has invented. By contrast, Krutikov's diploma project at VKHUTEMAS (1917) imagines on a technology yet to come. It does not specify anything; it simply plays with the idea of how a home might be provided for the "new human" once the earth's resources have been exhausted. It seeks to provide an image of a future reality in which, through technology, the spaces of work and life become more radically separated than ever before.

A similar parallel may be drawn between the towers of Vladimir Tatlin and Nicolas Schöffer. Tatlin's 1917/18 *Monument to the Third International* functions, from a future vantage point, as the political–cultural centre of a world society formed by the total expansion of revolution, commemorating the events of 1917. In this vision, we see the technology of world society appear in the rotation of the tower's glass bodies and in the grand steel spiral. For Tatlin, technology appears as a collective

force, possessed by human society and directed by the Communist Party, which revolutionises and represents society as a whole, freed from class divisions.

Like the *Monument to the Third International*, Schöffer's *Tour Lumière Cybernétique* (1962–1973) can also be understood as a manifesto with its own vision of the future. In Schöffer's case, the data-driven control theory of cybernetics projects a harmonious, hyper-rational future in which social functions are regulated by a technological apparatus that collects and interprets real-time data. By gathering and quantifying the society's aggregate information, the tower produces a kind of "democratic synthesis." At the urban scale, environmental and institutional data measured by the tower's sensors (transport, media, weather, etc.) would regulate the rhythms of the city in a continuous feedback loop. The aim is not the communication of information but an affective impact (a spectacle of light and sound) that softly controls social life. In this perspective, politics—and, more generally, the organisation of human communities and their conflicts of interest—becomes marginal. As Schöffer himself formulates it, the most significant difference between Tatlin's tower and his own is that while Tatlin's is political, the aim of the cybernetic towers is to establish a kind of "osmosis" within the political and social relations of the continent. Schöffer thus articulates, through cybernetics, a profoundly depoliticised vision of the future. In this conception, individual, group, or class participation is less relevant, and the idea of shaping society is reduced to real-time, data-driven, rationalised, technocratic governance. Schöffer's thinking clearly projects utopian tendencies of total social integration. "The tower will certainly not be an end, but an example and a beginning. It will be a detonator opening the way to other achievements on other scales, which will be able to weave ever closer links between people and life with a view to their greatest success, that is to say their greatest happiness." (Schöffer 1969) However, the strict logic of cybernetics and the idea of human organisation and political action drops out of the equation. Whereas in Tatlin's vision total informational and political control is held by the revolutionary party—which, according to the Leninist ideas of the period, concentrates the entirety of the politically active community of interest—in Schöffer's case this role is transferred to the technological apparatus, whose operating logic is cybernetics. (Jørgensen 2024)

While in the *Monument to the Third International* the primary informational function is the maintenance of the revolution through party agitation (Punin 1993 [1920]), in the cybernetic tower it is the creation of social "harmony" by means of data-based operationalisation. The basic situation of Tatlin's tower is the revolutionary transformation of humankind; in Schöffer's it is the total extension of contemporary technological logic. Naturally, the *Monument to the Third International* and the TLC tower are radical examples that sought to present their own underlying logics—Bolshevism in Tatlin's case, cybernetics in

Schöffer's—in total form, but precisely for this reason they are suitable for revealing the differences in technological outlook between the prewar and postwar modern movements.

The practice of systems-oriented design transformed the modern design imaginary, rationalizing it and pushing into the background the radical utopian tendencies of classical modernism. Cybernetics provided a toolkit for the emergence of new languages and new methodologies for design theory and practice, thereby drawing the methods and forms of modern design closer to the transforming postwar industries. The basic logic of cybernetics—thinking in knowledge-producing networks and in flexible work organisation associated with them—became embedded in the institutional history of modern design. It shaped the aims, scale, future vision, and practice of design. Among systems-oriented design projects one finds numerous works that, within different frameworks, address the erosion or opposition of the existing economic–political system (e.g., Bonsiepe's Cybersin project and Fuller's Spaceship Earth), and also works that regard design as a tool of effective industrial integration (e.g., Noyes, Doblin, and Wachsmann) within a production system based on flexible accumulation. These very different projects nevertheless share a common feature: they conceive of design as the solution to a mapped and describable set of problems, and they regard information as the raw material of design.

The influence of cybernetics on design simultaneously expanded the conceptual horizon of design, its practice, and the range of methodologies. At the same time, the language of technological rationalisation, subordinated the utopian, confrontational political dimensions of modern design. Whether in techno-utopian or market-pragmatic form, design became a question of modelling information and regulating inputs and outputs. Cybernetics was therefore not only a toolkit but also a depoliticising frame for the transformation of postwar modern design.

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THE SHIFTING INSTITUTIONAL LOGIC OF MUSEUMS:

ECONOMY, AUDIENCES, AND ARCHITECTURE

Márton Horn

ABSTRACT

This paper examines the contemporary transformation of museums as hybrid institutions situated at the intersection of cultural representation, public engagement, and market dynamics. It argues that museums have shifted from collection-centred, scholarly spaces toward experience-driven, audience-oriented cultural hubs shaped increasingly by economic pressures, evolving visitor expectations, and new architectural paradigms. The study analyses how changing funding structures, the integration of popular culture, and the rise of the experience economy have redefined the museum's social role and internal logic.

#museums, #hybrid institutions, #experience economy, #inclusivity, #House of Music Hungary

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DISEGNO_VIII/02_TOTAL(ITARIAN) DESIGN

INTRODUCTION

At the beginning of the twenty-first century, the role and function of museums are undergoing a profound transformation. While they were once primarily institutions dedicated to the preservation and scholarly processing of collections, they have increasingly become key actors in cultural community life and the global cultural marketplace. The notion of the museum thus extends far beyond the exhibition space: it simultaneously encompasses scientific, educational, communal, architectural and touristic dimensions, while situated at the intersection of social representation, cultural identity, and market logic. (Bennett 1995)

BACKGROUND

The Enlightenment placed a new emphasis on rational classification, universal knowledge, and the ordering of objects under systematic categories. Institutions such as the Ashmolean Museum (1683) and later the British Museum (1753) institutionalised these ideals, transforming private collections into public repositories and positioning museums as instruments for educating the citizenry (Bennett 1995). Yet the notion of "public" remained limited: access was controlled, and the interpretive frameworks privileged elite worldviews.

Beginning in the nineteenth century with the widespread establishment of national museums, these institutions took on an explicitly civic and ideological function. Collections that had begun as elite curiosities evolved into instruments of cultural representation and authority, transforming the museum into a tool for asserting political and intellectual dominance (Coombes 1994).

FROM AUDIENCE TO MARKET

From the mid-twentieth century, museums increasingly shifted from being closed, self-defining scientific institutions toward becoming cultural centres that sought dialogue with audiences while also adopting market logics (Bennett 1995). Globalisation, financial pressures, and changing societies radically reshaped the role of museums and gave rise to new participatory narratives.

From the 1970s, one-sided and politically motivated storytelling was increasingly questioned, both by the communities represented and institutions, whose local interests were increasingly subject to pressures of globalisation. Museums gradually came to recognise that serving an audience is just as important as representation. Today, it is difficult to imagine any museum, concert hall, or public space where the needs and expectations of audiences are not taken into account.

Prior to the rise of consumer culture, representation was largely one-directional: messages were formulated with minimal involvement of the audience or local community, and without engaging visitors. The market played a secondary role and the visitor was not defined as a consumer. Instead, science—and scholars themselves—operated with relative autonomy from the public. These two realms remained separated, a distinction reflected in both the buildings and the spaces created. Sacred spaces emerged in which science contextually and symbolically set itself apart from the public. The aim was not collaboration, collective thinking, or the creation of communal space, but rather the preservation of a "we and they" distinction.

The breakthrough came with globalising cultural policies: there was growing demand for accessible information, for new forms of social representation, for competition with adjacent cultural domains, and for the accommodation of market pressures that both created competition and standardised aspects of the field. Moreover, institutions were forced to become accountable: external funding (EU, state) demanded demonstrable social utility, while audiences required spaces that were accessible, inclusive, and enjoyable for all. These spaces had to act as mirrors of society, shaping it while simultaneously responding to it and encouraging participation.

By the late-twentieth century, new representational tools had emerged that allowed museums to employ strategies already common in community centres, concert halls, cinemas, and other cultural venues, thereby challenging the previous forms of representation. This opened up a new discourse on what museums mean today: how new architectural and curatorial narratives arise, creating a conceptual repertoire for contemporary cultural institutions. The extent to which new approaches to representation are perceived as undermining the authority of artistic and scientific disciplines and succumbing to excessive for-profit pressures (McGuigan, 2004) is an ongoing debate. How does the system of representational tools develop in the new kinds of museum spaces, and what are the consequences of these processes?

TRANSFORMING CULTURAL DEMANDS: DISMANTLING THE IVORY TOWER

At the very least, the perceptible shifts in cultural consumption, along with the growing importance of popularity and market considerations, have blurred the rigid boundaries between high culture and mass culture.

It has become unavoidable for museums to respond to the expectations of broader audiences. The goal of reaching wider visitor communities has reshaped not only how culture is interpreted and packaged but also how it is funded.

In the past, European and Anglo-Saxon countries funded culture in very different ways: Europe relied more on strong state support, while Anglo-Saxon countries combined public and private support from the outset. Today, however, these models are becoming increasingly similar. Most cultural institutions now operate with a mix of public funding, private sponsorship, commercial partnerships, and revenue-generating activities. As market actors—such as sponsors, corporations, and the experience economy—gain a stronger presence in the cultural sector, and as cultural policy encourages institutions to demonstrate social and economic relevance, the traditional line separating "high culture" from the mainstream becomes less clear. Cultural value is increasingly measured by public interest, visibility, and audience engagement. Something once seen as elitist or exclusive can now gain recognition precisely because it attracts large, diverse audiences and proves its relevance in contemporary society.

These standards are now measured less by quality or originality and more by quantifiable successes: rankings, reviews, viewing figures, and visitor numbers. Without such metrics institutions would risk irrelevance. As Hecken (2006, 85) notes: "Being popular means getting noticed by many". This change, however, entails an epistemic shift: quality and originality risk being subordinated to visibility metrics. According to Paßmann and Schubert (2020), aesthetic valuation in the digital age often stems from networked attention rather than critical consensus. The challenge for museums is to reconcile this new "economy of attention" with their curatorial mission.

Digital culture has multiplied access while fragmenting experience—visitors photograph artworks instead of contemplating them. The museum must thus rethink authenticity: not as an immutable quality of objects, but as a relational experience co-created with the audience (Jones 2010).

This raises the question of whether popularity necessarily dilutes cultural values and to what extent it is rather a new form of cultural participation. What is clear is that serving broader audiences leads to structural transformations within cultural institutions. The debate centres on how this occurs and on its advantages and drawbacks. The popularisation of culture certainly broadens access, but does this democratisation strengthen equality, or does it establish new cultural hierarchies? The democratisation of access need not imply devaluation. Therefore, inclusivity requires not only open doors but interpretive support. Educational programs, participatory design, and digital mediation become crucial tools for mitigating symbolic exclusion (Hooper-Greenhill 2000).

In this framework, museums ideally strive to assist interpretation, but this comes with compromises and challenges: they must preserve their authenticity while participating in economic and cultural competition. Technology can support accessibility and interpretation, but consumer-driven considerations must not dominate collection strategies. The preservation of material culture remains essential for national and local identity, and historical and scientific research cannot be conceived without it.

In Frederic Jameson's view, culture itself becomes commodified in postmodernism, a feature of late capitalism, where new products and technologies alter the classical concept of the commodity (Jameson 1991). Contemporary art is of course bound up in this dynamic and the sense in which art might be critical of consumer society has changed since the advent of late capitalism. Pop art, for example—Andy Warhol's work in particular—raises the question of where the commodity ends and where art begins. Pop art has entered the realm of high culture while using the tools of consumer culture, even if it is often understood as offering a critique of that culture.

Related to this are the dilemmas contemporary cultural institutions face. They simultaneously seek to meet the ideological expectations of high culture while keeping pace with economic and political demands. This balancing act requires accepting the pluralisation of cultural values, raising the difficult question of where the boundary lies between mainstream and high culture, and—crucially—who gets to decide.

In practice, institutions have an interest in avoiding sharp divisions since popular culture has emerged as a revolutionary force on the once-isolated terrain of high culture, striving to redraw its former boundaries.

THE INFLUENCE OF THE ECONOMY AND CULTURAL POLICY

The differing models of cultural financing, shifts in state involvement, and the growing dominance of market logic have all compelled museums to search for new operational pathways. Responses to audience demands can thus only truly be understood in the context of broader economic and political conditions.

In Europe, private sponsorship and corporate partnerships became essential. Governments reframed cultural policy in terms of "creative-industry" growth, encouraging museums to generate their own revenues while demonstrating social impact (Gray 2008). This shift reframed culture not only as a public service but also as an economic asset, positioning cultural institutions as contributors to urban development and tourism. Projects like the Guggenheim Bilbao exemplify this paradigm: the museum's spectacular architecture functions simultaneously as cultural symbol and economic catalyst (Plaza 2006).

Consequently, museums now navigate a triadic tension between public service, market survival, and symbolic legitimacy. Institutional strategies increasingly rely on diversified revenue streams—ticketing, events, retail, and cultural tourism—while still invoking non-profit values. This hybrid model situates the museum within what Andrea Witcomb (2003) terms a "contact zone": a field of negotiation among curatorial ethics, visitor expectation, and economic pragmatism.

Economic rationality and public mission can become mutually constitutive rather than opposing forces. The museum's sustainability now depends on its ability to articulate cultural value in both ethical and economic terms—a balancing act that arguably defines the contemporary institution.

VISITOR EXPECTATIONS—THE AUDIENCE-FRIENDLY MUSEUM

Growing demand for engaging visitor experiences requires increasingly complex service structures, which in turn drive up operational costs. Museums traditionally functioned as sacred spaces of knowledge and heritage, with architecture that reinforced hierarchical spatial structures and guided visitors through a prescribed sequence of revelation. Today, they are becoming open, community-centred, and experience-driven institutions, filling a gap increasingly felt in urbanised societies.

This "experience turn" aligns with what sociologists describe as the shift from the information society to the experience economy (Pine and Gilmore 1999). In this framework, visitors seek affective and memorable encounters; museums respond with immersive design, multisensory storytelling, and participatory activities. The result is a new social contract between institutions and their publics: the museum promises engagement, and the visitor contributes presence, data, and visibility.

This transformation has directly impacted financial needs, as audience-friendly services, educational initiatives, and experience-oriented exhibitions require far greater resources. In addition, cultural tourism has become a global phenomenon, demonstrating that large-scale cultural projects can even reshape entire cities (as in Bilbao). Tourism, in turn, exerts significant influence on museum financing.

Equally important is the rapid evolution of new technologies and digitisation. These developments simultaneously provide opportunities and challenges: they impose additional cultural and financial pressures, force institutions and creators into popularity contests, but also open up new sources of revenue. In this often contradictory situation, museums are continually asking themselves what visitors (consumers) need, and where the boundaries of artistic freedom lie in relation to these expectations.

The challenge is to reconcile conflicting cultural policy goals: to achieve high visitor numbers and revenues while fulfilling institutional missions, meeting public responsibilities, and adapting to market pressures. Artists also feel this dual pressure. Increasingly, creators consciously seek ways to meet both artistic and market demands, producing hybrid forms that serve such needs while sparking debates about whether these represent radical artistic innovation or simply the infiltration of mass culture into high culture.

INSTITUTION AS SERVICE PROVIDER

In the wake of the service-oriented turn, the museum can increasingly be understood as a "third place" (Oldenburg 1999) where cultural mission intertwines with community experience, brand-building, and considerations of sustainability. This new operational logic manifests not only in content but also spatially: architecture is becoming an active agent in the museum's narrative. Our observations in the House of Music show that museums with more open spaces and less prescriptive floor plans—spaces that can be seen as facilitating social interaction—achieve higher visitor numbers. In such spaces, museums can more easily monetise ancillary services: cafés and other hospitality, museum shops, supplementary programs, and events. By continuously renewing exhibitions, museums promote the idea that a visit is no longer a one-off experience.

These dynamics appear not only in service areas but can permeate core operations as well. Exhibition concepts may be shaped by market logic—albeit to different degrees in publicly funded versus fully private institutions. The curator's role has changed: complex organisational decisions determine exhibition content, and annual market strategies can influence artistic programming. Alongside art-historical criteria, institutions now frequently rely on market research and marketing strategy. Narrative, too, has assumed a central role; like visitor journey design, storytelling has become a core institutional function. From architectural conception to exhibition design, dramaturgy is decisive. The exhibition becomes a coherent story consumed experientially—much like watching a film or attending the theatre—and this can extend to other spaces within the building. The goal is to create an experience—typically through immersion and affect. The architecture itself can provide the framework for this.

ON ARCHITECTURE AS NARRATIVE

Distinct from architecture as a support structure of exhibition narratives—a set of spatial metaphors that structure the visitor's emotional and cognitive journey (MacLeod 2005)—is the notion of architecture as narrative itself. The latter has its own cultural mission, community

potential, and touristic appeal. The rise of "starchitecture" and the rethinking of communal spaces, however, raise new questions: how can all this be sustained over the long term, given economic and ecological constraints?

It is worth highlighting broad shifts in the formation and transformation of museum architecture. A museum typically bears the defining architectural marks of its era. Historicising idioms, for instance, often produced sacral, hierarchically ordered spatial structures that guided visitors through a prescribed sequence of revelation—, narrated the history of (classical) art through a heavily linear structure. The buildings functioning as scenographic instruments of high-cultural representation as the main mission of the museums.

Contemporary museum architecture now rather prioritises buildings where their spaces are used not only for housing and presenting objects (for museum visitation), but as part of everyday communal life, grounded in quotidian experience and the enjoyment of place. Interdisciplinary spaces emerge in which, beyond core functions, mixed-use, leisure-oriented zones appear, along with more indirect modes of experience afforded by atmosphere. In other words, beyond visual perception, increasing emphasis is placed on how we feel in a space and on the layered ways we can live the time spent there. Shifting technological possibilities and changing cultural habits both support this turn. This turn corresponds to what Hilde Hein (2000) called the "museum in transition"—an institution that constructs meaning through affective and participatory engagement.

The cleaner, more legible design culture of everyday life has also become decisive in shaping museum spaces. As cultural venues operate ever more on market terms, they seek simultaneously to enable an increased consumer experience and to fulfil the function of cultural representation despite market pressure. One form this takes is that not only individual artworks, but the very building itself becomes a quasi-artwork. Whereas in early institutions this appeared in the elevated decorative grandeur of historic edifices built for elites, since the second half of the twentieth century the cult of contemporary star architecture has served—albeit with different aims—as another instrument of representation. A further trajectory is represented by museums whose buildings themselves carry the institution's primary narrative message—quasi-monumental museums, such as Jewish and Holocaust museums. Architecture therefore becomes a curatorial device: spatial sequences and atmospheres can guide interpretation as effectively as labels or texts. Daniel Libeskind's Jewish Museum Berlin, for instance, deploys disorientation and voids to evoke loss and rupture—translating historical trauma into spatial experience.

Sou Fujimoto's House of Music Hungary (2022) represents a more recent iteration of the museum-as-experience, one that has been es-

pecially useful for me as director of the institution. The building's porous structure blurs interior and exterior, embodying the continuity of nature and culture. Fujimoto's design emphasises transparency and human scale. Its perforated canopy creates dappled light reminiscent of a forest—which could be interpreted as spatial metaphor for harmony between art and environment.

Along these lines, he reconceives spaces and the time spent within them, attempting to dissolve the boundary between the built and the natural, constructing productive oppositions—inside/outside, constructed/natural, communal/private. He employs these polarities as a new dramaturgy of spatial composition, creating an architectural whole that enables unprescribed modes of use that positively affect its users. His aim is not to convey a strong discursive message but to produce an effect on those who inhabit the space.

Of course, every building produces different relationships between institution, visitor, and architecture, which are shaped by myriad factors. Ultimately, the uppermost goal is to create a museum building fit for its context—one that truly functions in dialogue with architecture, institution, and users. Today, this is strongly influenced by those who use the spaces, as well as by funders and political stakeholders, all of which could push the presentation of art into the background. This leads to criticism that star architecture may undermine the artworks and the institution's actual remit, instrumentalising artistic content as mere "decoration" for architecture commissioned for market or touristic reasons.

Architecture is capable of producing its own narrative, confronting visitors with environments that step away from the everyday and place them in a new situation. It becomes a subtext which reminds us that museums always construct artificial environments—frameworks that enable relationships among content, objects, and visitors, and support the understanding of connections among them. Yet the opposite can also occur: architecture may hinder interpretation.

Without the building and its associated spaces, there can be no discussion—at least in the contemporary museum—of reception, institutional messaging, and perception, since the frames are constituted by space and its atmosphere. Through its spaces, functions, and permanent or temporary exhibitions, the museum creates situations that invite visitors into this shared narrative. In some cases the building itself becomes the primary focus of the museum experience.

In recent years, museums have increasingly sought to complement their core tasks with the widest possible array of instruments: related programs, installations, educational content, and activities that support visitor participation or leisure. At the House of Music for instance, this complex institutional structure—housing performing arts, museological, and music-education functions under one roof—is, in part,

an institutional experiment. Spatially, the integration is achieved by freely usable communal zones and programmatically by offerings that connect the domains. This enables a complex functional use in which multiplicity supports a broad economic palette while allowing the institution to fulfil public responsibilities and act as a communal space. Overall, the building can provide the supportive framework for treating cultural goals as a whole and for reaching new audiences, thereby optimising revenues.

THE MUSEUM AS A COMPLEX CULTURAL MEDIUM

Mounting an exhibition has accordingly become a complex team effort: curators, architects, communications professionals, scenographers, fabricators, and digital producers work together to build a unified dramaturgy. This shift also makes it possible for institutions to think beyond the object—either supplementing artworks or, at times, mounting exhibitions without them. These innovations blurred the line between curator and user, reinforcing the idea of the museum as a distributed, collaborative platform (Simon 2010).

In designing our own permanent music-history exhibition at the House of Music Hungary, we sought to translate these principles into practice by placing emotional engagement at the centre of the dramaturgy. The aim was to enable visitors to move through the broad arc of music history while gaining a clearer sense of how different periods relate to one another—inviting them to engage with the evolving relationship between sound, society, and expression. Rather than presenting history as a linear sequence of facts, the exhibition sought to immerse visitors in atmospheres, practices, and sensibilities that characterise different musical eras, encouraging them to listen, explore, and physically engage with interpretive elements. Visitors were thus offered a range of interactive, sensory, and audiovisual experiences designed to evoke emotional resonance and support personal meaning-making.

These approaches demonstrate that exhibitions must ultimately convey atmosphere and emotional tone. Research consistently shows that visitors remember information more effectively when it resonates affectively and is embedded within a narrative framework from which they can construct their own interpretations (Hooper-Greenhill 2000). Exhibition-makers therefore focus on creating conditions that support such narratives—designing environments, interactions, and interpretive layers that guide without prescribing, and that invite visitors to situate themselves within the story of the exhibition. In this sense, the role of the curator expands beyond object selection to the orchestration of experiential, sensory, and conceptual cues that enable visitors to build personal yet institutionally informed narratives.

Museum stakeholders need to work out how to serve public taste while maintaining artistic commitments. For a purely market-oriented cultural venue the calculus is clear, since economic performance is paramount. For state-funded museums, the public mandate is decisive—the social mission for which they receive support. In practice, institutions finance operations from both sources, and thus must simultaneously satisfy market expectations and their own cultural missions.

CONCLUSION

The museum's transformation—from the nineteenth-century project of national representation to a twenty-first-century experience- and community-oriented concept—should not be understood merely as gradual opening but as a shift in cultural logic. The rise of participatory museology and the dominance of the experience economy has challenged the traditional hierarchy between institution, curator, visitor, and artifact. The real question is simply no longer whether it can respond to visitors' expectations, but whether it can preserve its institutional integrity in an age when memory, identity, and cultural representation increasingly become arenas of political and economic contestation.

This raises a further dilemma: what, today, counts as a museum at all? Experience-driven institutions—often without collections—together with thematic attractions and digital venues can draw audiences as effectively as classical collection-based institutions. Yet this phenomenon can blur the boundary between museum and entertainment centre, calling into question the extent to which the preservation and transmission of knowledge remain the museum's core task.

The issue, therefore, is not only how museums can continue to find new ways to address audiences, but also how they can define their own boundaries. If experience institutions without collections identify themselves as museums, the very concept of the museum risks dissolution into the logic of the cultural market—even if such institutions are often innovative. If, however, the museum maintains its basis in collections while functioning as an experience, a communal space, and a reflexive cultural medium, it can retain a distinctive social relevance—not merely as a producer of experiences, but as a responsible mediator of memory and knowledge. The dilemmas of representation, therefore, are not problems to be solved once and for all but dynamic tensions that define the institutions. Museums remain relevant because they mediate the tensions between art and commerce, tradition and change, and the individual and the collective.

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Preface to the 50th Anniversary Special French Edition of The Limits to Growth

Dennis Meadows

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In an amusement park near Metz, France, is Anaconda, one of the tallest wooden roller coasters in Europe. It serves as a useful analogy for thinking about limits to growth fifty years after the publication of our original results.[1]

In 1972 humanity's situation was in one way similar to that of people who held tickets for a ride on Anaconda. They could have decided not to take the trip. Instead they remained on the train assuming the benefits of the ride would be greater than the costs. In 1972, despite the enormous public debate stimulated by our findings, people implicitly assumed that the benefits of riding the growth train further would be greater than the costs.

But, of course, a roller coaster can not carry people higher forever—not even if it has been designed by French engineers. Eventually the coaster car reaches its limit, slows down, and begins its decline. Now it is fifty years later, and humanity's situation is similar to that of the people in the coaster car at the top of the highest hill. Now they no longer have the option of deciding whether the benefits of the ride will exceed the costs; they are committed to the full trip. Everyone on the roller coaster has already given up their control over the speed of decline and the path of the train. As the car starts its drop their only option is to hold on as best they can and hope they will survive the ride.

This analogy has limitations. A roller coaster ride typically lasts a minute or two. For example, the Anaconda trip lasts only 130 seconds. The train always returns to its starting point without harming its riders. After it stops they can get off the train and resume their life essentially as before.

For humanity it will be different.

[1] *This text is published in English for the first time here. Dennis Meadows' original French preface can be found in Meadows et al. (2022, 5–13).*

Global society will be on the post-growth descent for more than a century. The path is uncertain, and many will suffer during the journey. Some possibilities still exist for marginal influence over the process of decline, but civilisation is definitely moving towards a condition very different than where it was before riding the growth train

My MIT team neither imagined nor suggested that any single one of our 1972 computer model simulations was a prediction for the precise future path of growth in the global system. However, over the past decade several independent studies have compared our principal projections with the historical paths of important global indicators. The studies concluded that our business as usual scenario (BAU, fig.1) approximates the major historical trends over the past fifty years. Thus that scenario has become an influential paradigm through which I interpret current events and anticipate the future. Its main features will be reflected in the thoughts I present here.

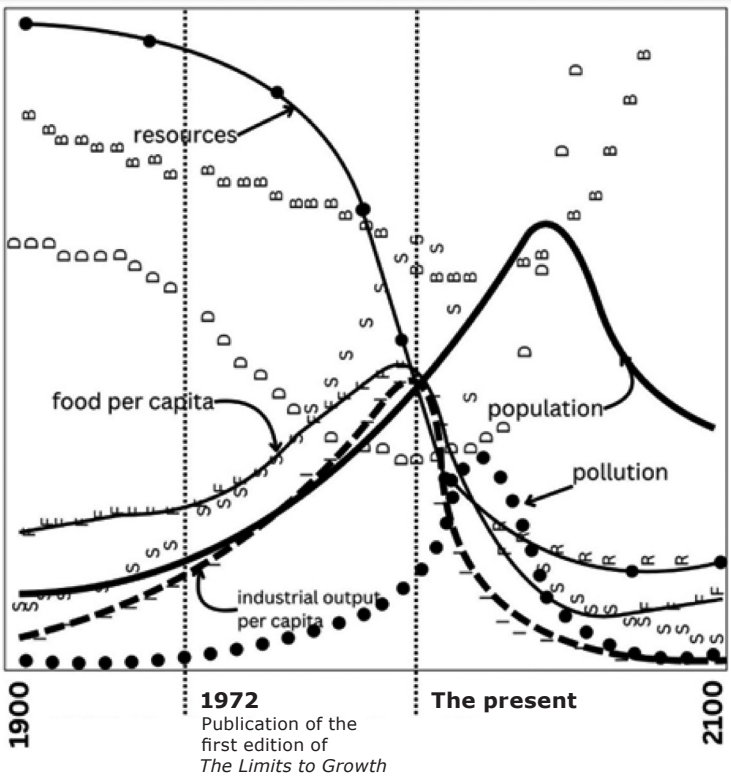

FIGURE 1. *The BAU scenario (fig. 35 in the first edition).*

Our analyses for the Club of Rome were conducted to understand the causes and consequences of physical growth on a finite planet. We focused on five indicators of that growth—population, industrial output per capita, food per capita, non-renewable resources, and persistent pollution.

Their growth could not continue forever. We foresaw that the expansion of each would be forced by planetary boundaries to slow and then reverse. We did not attempt to provide insights about the conditions that will arise on this planet during the decline. Our reports deliberately avoided making even a single speculation about the conditions of the world after the parameters we studied had each risen to their maximum values.

But it is important to speculate about those conditions now, because they will imminently confront humanity.

I believe that global society is entering an extended period during which its demands on the resources of this planet will be reduced by a variety of physical and social processes. Those demands will be forced back down to levels that can be borne by the earth. I do not know the precise timing or identity of the events that will make that happen, but I expect they will have four features.

First, I expect that the forces opposing physical growth on this planet will become most intense over the next several decades. This may seem counterintuitive. Looking at the BAU scenario above, it is natural to conclude that the forces constraining growth will be most severe during the steepest part of the descent - some decades from now. Unfortunately, that is not true. In order for growth of any factor to reverse, the forces opposing its expansion must grow larger than those supporting it. The forces supporting growth are greatest now, while the world is still relatively wealthy, and its peoples and institutions still share the desire for ever more growth.

An example is the enormous amount of money that was printed in the desperate effort to sustain economic growth during the first years of the pandemic. There will be neither the political will nor the practical capacity again in the future to provide such stimulus. Once physical decline becomes widespread the forces attempting to sustain growth will be weaker, and humanity will also experience the opposing forces as weaker.

Thus it is the present generation that will experience the greatest traumas from the various forces that cause decline in population and productive capital.

For population to decline, the death rate must exceed the birth rate. Attempts to reduce fertility have become politically unacceptable. Those blocking attempts to reduce fertility are implicitly choosing to rely on rises in the death rate for the inevitable transition. For production to decline, the depreciation of productive capital must exceed the investment rate.

Attempts to reduce investment are generally unacceptable. Thus capital depreciation will rise. Until more attractive alternatives are pursued, the stock of productive capital will mainly be reduced by climate change, technological obsolescence, and war.

Second, I expect that the various environmental and social factors that arise to force the physical dimensions of our global society—among them population, food production, and resource extraction—back down

to bearable levels will be regarded and treated as separate problems. Each of them will call forth local concerns and short-sighted efforts.

Climate change is an excellent example of this. Nations are mostly concerned about its effects within their own borders. And their responses are formulated out of narrow, short-term national self-interest.

But phenomena such as changing climate, spreading viruses, growing food shortages, rising energy prices, and mounting levels of persistent pollutants in the environment will not be eliminated by suppressing their symptoms. Consider the example of cancer. Often a person hosting a cancer will be in intense pain. It may be useful to give the sufferer a pain killer, because it will make them feel better in the short term. But that does not solve their problem. Pain is only a symptom of the real problem, which is cancer. Unless the cancer is removed, the patient will not be cured.

For the globe, physical growth in population and resource use is the cancer.

Third, I expect that as the inevitability of the end of growth becomes more widely accepted, there will be a shift in emphasis from preventive measures at the global level to adaptive measures at the local level. The goal of global sustainability will give way to the goal of local resilience.

Sustainability is a goal of the global system. The term is effectively used to describe a world in which the rich keep what they have while the poor are allowed to become richer. In a world where resource consumption is far above the regenerative capacities of the planet that is not possible. In (Meadows) 1999 I already wrote an essay for Süddeutsche Zeitung, arguing it was already too late for sustainable development. Thus sustainability is impossible and efforts to achieve it are causing frustration.

Resilience is a characteristic of the global system's behaviour. It is the capacity of the system to absorb shocks and still continue to produce essential results, such as food, housing, health, and employment. Efforts to achieve resilience can be productively undertaken at all levels—personal, family, organisation, community, region, globe.

Sustainability is a global goal that could only be achieved by agreement and sustained, concerted action by all the globe's important players. That will never happen. Resilience is a local goal that can be achieved by individuals through short-term, local action. It is already happening.

A system is not sustainable unless all its components are sustainable. A system becomes more resilient every time one of its components becomes more resilient. I consider the quest for resilience to be the most exciting and productive intellectual challenge of humanity over the coming century.

My fourth expectation is that the decline required to bring global society back within its limits will be occasioned by enormous political change.

The biggest threat of declining growth will be to the social fabric. The promise of indefinite growth—more for everyone forever—has been the single largest contributor to the social cohesion necessary for effective governance. In a system where every participant expects eventually to have more, it is possible to reach a consensus even for actions that some expect will give them less in the short term. But when everyone understands that growth is no longer possible, when life is perceived to be a zero-sum game—where one can get more only if another gets less—then consensus disappears. No governance system will be able to accomplish necessary changes, because those who expect to get less will block action.

Acknowledging this general fault simply recognises reality; it does not imply a personal preference for one form of governance over another. It is obvious that none of the globe's present governance systems are effectively coping with long-term global problems, such as rising persistent pollution, growing economic inequality, the spread of nuclear weapons, or climate change. This is not a failing unique to the democracies. Every political system is failing to resolve these global problems. The quality of natural resources is deteriorating on every continent and in every nation.

Human groups have employed many different forms of governance during the several hundred thousand years our species has lived on this planet—monarchy, democracy, oligarchy, theocracy, aristocracy, and numerous others.

Any of these different governance systems could potentially produce a more attractive future for humanity if they reflected a concern for equity, environment, resilience, and welfare and considered impacts that are distant in time and space to be as important as those that are proximate. No governance system will produce an attractive future if it is dominated by people who are self-centred, corrupt, short-sighted, or ignorant.

Fifty years ago I naively thought that our report would promote a longer- term view among decision makers. It obviously failed in that. However, this report has convinced many thousands of its readers around the world to change their views, their educational goals, even their careers in order to pursue a more constructive social response to the problems of growth.

They are an important resource in the effort that lies ahead. An understanding of the fundamental causal mechanisms described in our report will aid them in pursuing the best available remaining options.

With children there is no confusion about the difference between physical growth and human development. Each is useful at an appropriate time.

Initially growth is important, and parents are happy to watch as their children grow larger. Bigger is considered to be better in the early years. But as they mature into their mid-teens people are no longer expected to

grow ever larger. Indeed, continued growth at that stage is a matter for concern. Instead parents value non-physical development—self-awareness, social relations, professional competence, formal learning, athletic prowess, musical skills, artistic expression.

Global society has not yet understood the distinction between physical expansion and qualitative development. It has passed the stage where more physical expansion is desirable. No widely shared global goal is now served by having more people or material goods. Now it is important to

learn how to advance the development of our species—achieving equity, peace, psychological balance, physical health, environmental quality.

If that is achieved, then on the hundredth anniversary of our original report, someone will be able to write a book entitled There Were No Limits to Development.

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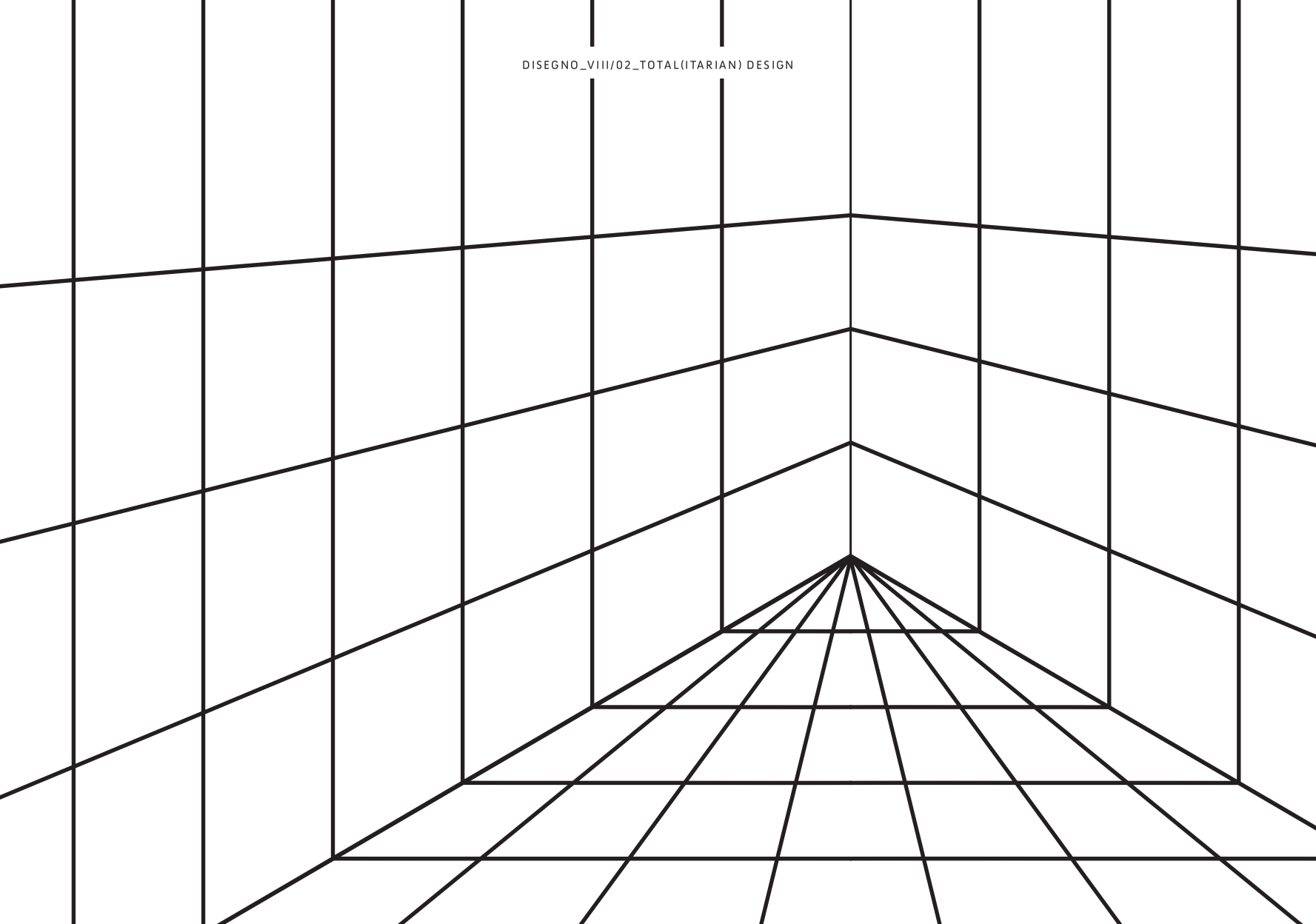

The Somaesthetic Impulse, or How Can Design Culture Shape Our Life Forms?

Richard Shusterman and Bálint Veres, eds: Somaesthetics and Design Culture

Ármin Tillmann

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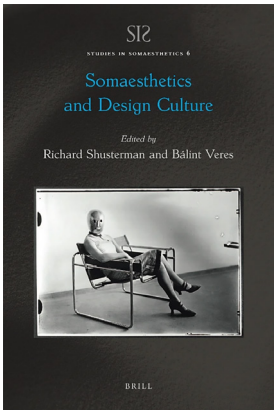

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Leiden: Brill, 2023, 309 pages.
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When we have the impression we can hardly see a way out of a discourse because it has become so specialised and complex and the weight of a library's worth of literature is bearing down on us it is usually a good strategy to take a step back and return to the fundamental starting points for a few thoughts. The present study collection is organised around two key concepts: *somaesthetics* and *design culture*. What is the purpose of somaesthetics, or, more precisely, what is the *raison d'être* of the discipline of somaesthetics? And what does the term "design" actually mean? Is it worth keeping this expression unchanged, or does it need to be critically rethought?

In the twentieth century, corporality regained influence in Western thought after the apparent predominance of mind and consciousness. To mention just a few works of outstanding importance: Merleau-Ponty's *Phenomenology of Perception* ([1945] 1962), Michel Foucault's four-volume *History of Sexuality* ([1976–1984] 1978–1984), Thomas Laqueur's *Making Sex: Body and Gender from the Greeks to Freud* (1990), Jean-Luc Nancy's *Corpus* ([1992] 2008), and last but not least George Lakoff and Mark Johnson's *Philosophy in the Flesh: the Embodied Mind and its Challenge to Western Thought* (1999).

After the so-called *corporeal turn*, the American pragmatist philosopher Richard Shusterman coined the term somaesthetics to revive the ancient conception of the body at a distance from the phenomenological tradition.

In the "Introduction" to *Somaesthetics and Design Culture* Shusterman and Veres point out that somaesthetics faithfully reflects *kalokagathia*, the ideal of beauty from antiquity, according to which beauty and virtue go hand in hand, and seeks to restore the unity between the theory and practice of the philosophical way of life, *vita contemplativa* and *vita activa*. Thus, somaesthetics "would signal the field and its orientation towards practicing philosophy as an ethical-aesthetic way of life" (2–3), whereas the Greek word *soma* designates "the sentient, lived body as a site of active perception and subjectivity: an unavoidable component of all aesthetic experience" (3), and *aesthesis* means "sensory perception." What makes the somaesthetic approach unique is that it implies "a project of appreciating and cultivating the body not only as an object that externally displays beauty, sublimity, grace, and other aesthetic qualities, but also as a subjectivity that perceives these qualities and that experiences attendant aesthetic pleasures somatically." (Shusterman n.d.)

In Shusterman and Veres's recapitulation of the history of somaesthetics they are careful to distinguish the concept of design from the closely related problems of postmodern consumer culture and the aestheticisation of everyday life. However, I do not think that their use of the term is sufficiently critical even though this would be crucial in relation to a systemic phenomenon such as design; a cultural product of the second industrial revolution and of capitalism. They write that the concept of design is "often tied to functionality, operability, communication efficiency or marketing and pay-off" (2), yet this is not the concept they use in the context of somaesthetics *as* a design product. That said, Shusterman and Veres do focus on a previously ignored range of meanings of design, which complements the capitalist counterpart: "design as something sensual, pleasing, emotionally significant, and engaging" (2).

All this sounds promising, but design, by its very nature, is not a transhistorical phenomenon; its conditions are tied to a particular era. It is unlikely that the concept of design can be separated from the cultural logic of late capitalist industrial production and consumer society and, since it must perpetually innovate, it is implicitly required to suspend tradition, modes of experience transfer, and cultural continuity in order to be radically innovative and new: to create new design objects, come up with new ideas, and institutionalise new lifestyles. Therefore, no matter how critically we try to grasp it, the term design will always remain compromised.

In order to give design a completely new meaning, we would need to change the production conditions required for the manufacture of design objects, moving away from the capitalist mode of production towards a more equitable use of materials that do not exploit the environment, is based on renewable resources, and, as in twenty-first century craftmanship, operates on a cooperative basis as a sustainable mode of production that takes material justice into account. At the same

time, a synonym for design that broadens the scope of the concept can be helpful. One such alternative is *form planning*, a term derived from the German concepts *Formbildung* and *Gestaltung*. I consider this term adequate because it implies that design cannot be narrowed down to merely industrial creation, such as the production of design objects, and also includes the planning and development of lifestyles, ways of life, or even forms of life.[1] The architectural analogy is useful: what is architecture if not essentially the same thing, that is form planning, only on a larger scale?

Just like design, architecture is practice-oriented, with the spaces and contact surfaces it creates having use value, as people dwell and work in them, move around in them, and interact with each other in them, but it can also have a decorative-ornamental, delightful, atmosphere-creating, aesthetic purpose that promotes one's well-being, which Walter Benjamin once called exhibition value (*Ausstellungswert*) in his well-known essay "The Work of Art in the Age of Mechanical Reproduction" ([1935] 1999). Although admittedly a commonplace, architecture creates spaces, both physically and abstractly. Architectural space includes, among other things, planning, occupation, and design. Since all this involves interventions in the everyday life of a community or a society and its environment, the space-creating function of architecture is inevitably political in nature, and any attempt at neutralisation that seeks to justify its political decisions and ideological presuppositions on purely professional grounds will inevitably entail an ideologically critical analysis.

Somaesthetics and Design Culture was inspired by an international conference entitled *Design Culture and Somaesthetics*, which was held at the Moholy-Nagy University of Art and Design Budapest in 2019. Several chapters are adapted versions of the presentations given at the conference, although "the book developed to include other texts and integrate perspectives from the history of ideas, epistemology, ritual studies, psychology, affordance theory, educational studies, and design history" (7).

Having outlined the merits and possible shortcomings of *Somaesthetics and Design Culture*, I will now attempt to provide a summary of it.

The book's first part ("Studies on Limitations") begins with Bálint Veres's paper "A World Is Born: Craftsmanship, Mediality, and the Somatic Implications of Plato's *Timaeus*." Plato's craftsman presented in the *Timaeus* establishes a link between somaesthetic approaches to making and contemporary design theory. Veres advances two key arguments. First, despite the distance in time, Plato's philosophy continues to shape how modern design culture understands and performs practices aimed at creating or transforming objects and living beings. Second, Plato's account of creation indicates that no act of making can be conceived without relying on some form of mediation and without being implicitly associated with processes of procreation and birth (28–29).

[1] *This journal has employed the notion of design culture in a similar sense, in line with international scholarship in the emergent post-disciplinary field of Design Culture Studies. Although terms such as* Formgestaltung *or* Formgebung *were not unknown to Anglo-Saxon or Scandinavian authors—often appearing in the expression* formgiving*—they generally referred, like their Hungarian counterpart* formatervezés*, to industrial or product design in a relatively narrow sense, without encompassing the design of lifestyles or ways of life. (–eds.)*

Mădălina Diaconu's text "From Making to Lighting a Candle: On Functions, Meanings, and Bodies in Ritual Design" appears to pursue even broader ambitions by centring on an anthropological constant: the human as a ritual being. At first glance, the theme of ritual may seem out of place in a volume devoted to design culture and somaesthetics, which privileges innovation and critiques the unreflective routines, repetitive habits, and traditional practices typically associated with ritual. However, this somewhat Sisyphean attempt to reconcile autonomy-driven, momentary, and capital-dependent design with collectivizing, tradition-based, and transformative ritual illuminates important theoretical limitations within design culture. First, any design that seeks to generate rites *presupposes a philosophy of the embodied subject*: a rite must be enacted, and enactment requires an active soma. Second, the bodies that design addresses—as its targets, users, and representatives—are themselves already *shaped by ritual enculturation*. As a result, designing rituals effectively amounts to planning the enculturation of the body, that is, intentionally shaping its form, consciousness, and behaviour. Thus, although ritual may initially appear to stand in opposition to design, their interaction reveals mutual constraints.

Jessica Hemmings opens her chapter, "Can That Be Taught? Lessons in Embodied Knowledge from Memoir Writing for Craft and Design Education," with a quotation from the Hungarian-British chemist and philosopher Michael Polanyi: "We can know more than we can tell." This statement outlines the conceptual triad that shapes her analysis: embodied knowledge, conceptual knowledge, and the mediating or translating function of language between them. Her epistemological inquiry calls for a reassessment of how learning is understood and practiced within institutional environments—particularly art and design schools—that tend to be conventional and uncritically self-assured. The chapter is organised around the question *Can that be taught?* and yields a provocative "no" when teaching is conceived solely as a mental activity, yet offers a cautiously affirmative "yes" when teaching is understood to include somatic learning and self-directed education. For Hemmings, the issue is not whether language can mediate between tacit and discursive forms of knowledge, but rather *what kind* of language is capable of doing this work.

Steven Leuthold's chapter "Soma and Symbol: The Bridging Function of Style in Design History and Culture" discusses a variety of polarities that nonetheless reveal important continuities, such as somatic versus discursive knowledge, nature and history, unconscious habit and conscious intention. A central opposition is the silent base of the soma and its nervous system that is considered more or less anthropologically constant versus the irreducibly diverse symbolic sphere of cultures and societies through which our somatic being is expressed in myriad ways. But what can mediate between these factors? In Plato's three-part model, *khôra*

serves as a mediator between eternal forms and fleeting phenomena. Similarly, Leuthold proposes that the concept of style—beyond its traditional use in art history—can function as a mediator between the somatic and the cultural. Leuthold revisits Wölfflin and other early theorists, noting that the original understanding of style involved intuitive knowledge and a particular perception of the world, one that resides dormant in the body. According to Leuthold, this somatic dimension was later undervalued, leading to a general depreciation of the concept of style. In contrast, he aims to highlight the enduring significance of style beyond art, stressing its bodily foundations and linking these somatic roots of creative action with the broader social realm of symbolic practices. In this view, style emerges as an epiphenomenon in the "in-between."

The second part of the book, "Bodies, Senses, and Power," marks a clear shift in emphasis. Guy Julier's "Sensing Kalasatama: Design Culture and Neoliberal Bodyhood" interrogates the concept of the rational city—or "rational landscape"—from a political standpoint, bringing questions of power and their correlates within the human sensorium to the forefront. His analysis centres on Kalasatama, a recently constructed district in Helsinki, a city that promotes itself as "the world's most functional city" through the promise of a high-tech urban environment designed to save residents one hour of time each day. Julier argues, however, that this supposed temporal gain entails a corresponding cost paid through specific sensory, gestural, and habitual bodily dispositions. What might initially appear to be disparate topics—neoliberal financialisation and the production of docile, experientially oriented consumer bodies—are examined through a hybrid methodological approach combining qualitative and quantitative discourse. This mode of inquiry closely aligns with forms of "artistic research" that somaesthetics has increasingly cultivated over the past decade.

Extending the discussion of neoliberal built environments, Matthew Crippen's "Bodies Under the Weather: Selective Permeability, Political Affordances, and Architectural Hostility" examines the repercussions that arise when design culture assumes dominance and channels the somaesthetic dimensions of inhabitants and citizens into frameworks shaped by power-driven aspirations. He identifies exclusionary design, hostile architecture, defensive territoriality, selective permeability, and social dysfunction as salient features evident in the "body language" of two architectural cases: the Richard M. DeVos Center at Grand Valley State University and the recently renovated Tahrir Square in Cairo. Although Crippen acknowledges the theoretical possibility of envisioning a design culture guided by somatic awareness and the meliorative aims of pragmatic thought and democratic practice, he also highlights how built environments can be reclaimed as stages for spontaneous rituals, protests, and communal ceremonies—activities that foster social cohesion and somatic freedom.

Tom McGuirk and Alan Summers's "Across the Threshold: A Somaesthetic Approach to the Design of Extended Realities" can be read as a manifesto encouraging designers to cultivate greater somaesthetic awareness in order to develop more experientially enriching approaches to extended realities. Although they refrain from prescribing a definitive method for achieving this aim, they seek to foster advancement through conceptual argumentation and the presentation of instructive artistic examples. On the theoretical plane, they advocate replacing the Cartesian model of cognition with a framework informed by phenomenology, pragmatism, somaesthetics, sociology, and art history.

The third part of the book, "Transformative Experiences," illustrates how enhanced somaesthetic awareness can reshape the experience and practice of artists and designers. It demonstrates how such awareness facilitates a shift from a narrowly object-centred approach to one grounded in situational and relational design. In the chapter "Bespoke Healthcare Design" Dina Shahar and Jonathan Ventura reveal how the typically unquestioned foundations of design—function and aesthetics—acquire renewed significance and dynamism when approached through a more finely attuned somatic sensitivity. Their analysis further shows how design informed by somaesthetic insight surpasses the limitations of traditional ergonomic paradigms, which remain anchored in standardised bodily norms that restrict the recognition of human diversity.

Else Marie Bukdahl's "Sensory Activation in Design, Art, and Architecture – a Somaesthetic Perspective" likewise draws attention to socially oriented works that seek transformation through the integration of somatic and social knowledge. A central example is *Little Sun*, a project by her former student Olafur Eliasson, which functions simultaneously as a meliorative eco-design initiative and a program in social entrepreneurship, while also embodying the richly sensory aesthetic qualities characteristic of his installations. The aspirations of this project evoke a long-standing dilemma in cultural theory, dating back to early high modernism: although art and design profess to expand and invigorate the breadth of human experience, they often struggle to deliver sustained experiential intensity or meaningful transformative impact on personal and interpersonal social life.

The final chapter, "Designing for Somaesthetic Transformation," is co-authored by Shusterman and computer scientist Dag Svanæs and they introduce a key concept: transformative somaesthetic experience. After elaborating ten key features of the conceptual logic of transformative somaesthetic experience, the authors propose two essential considerations in designing for such experience. First, the design must not focus narrowly on the designed object but must design for an entire situation that embraces both object and subject and the environing atmosphere. A second strategy is the introduction of the nonhabitual to stimulate awareness by dramatizing difference.

While it is warmly welcome to have such a comprehensive, interdisciplinary book conveying in-depth knowledge, I fundamentally miss the concept of *philosophy as a way of life*—a concept which can be easily linked to somaesthetics and which could create continuity between the ancient philosophical tradition and intellectual currents with cultural practices from the Far East (such as yoga, tai chi, zen meditation, or even Feldenkrais) which are thoroughly conceptualised and practiced by Shusterman. Philosophy as form of life would be a constituent moment for somaesthetics because, as the French philosopher and historian of philosophy Pierre Hadot has demonstrated, ancient philosophy was not merely a deepening of thought or an intellectual exercise, it was regarded as an art of living, a practice aimed at relieving suffering and shaping, and remaking the self according to an ideal of wisdom. In this sense, design should be understood as a self-shaping activity, or, as Foucault (1988) would say, as technologies of the self. Hence, self-design is a transformation process which changes not only a person's way of thinking, but also their way of life, and ideally has an impact on their immediate environment in the form of a virtuous philosophical conduct. "Such is the lesson of ancient philosophy: an invitation to each human being to transform himself. Philosophy is a conversion, a transformation of one's way of being and living, and a quest for wisdom." (Hadot [1981] 1995, 275)

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Objects in Exile

An Interview with Robin Schuldenfrei by Ágnes Anna Sebestyén

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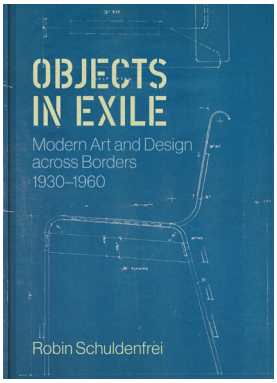


Robin Schuldenfrei. Objects in Exile: Modern Art and Design across Borders, 1930–1960. *Princeton: Princeton University Press, 2024, 352 pages. ISBN-13: 978-0-6912-3266-9*

Ágnes Anna Sebestyén met Robin Schuldenfrei on the occasion of the Cumulus conference organised by the Moholy-Nagy University of Art and Design in May 2024 in Budapest. Within the framework of this conference, Sebestyén moderated a talk with Schuldenfrei to mark the Budapest launch of *Objects in Exile*, which was published in January 2024. Political and economic migration, displacement by war, and the exilic condition are just as topical now as they were on the brink of World War II. *Objects in Exile* focuses on how the processes of migration were essential to the development of modernism. Schuldenfrei follows prominent modernist figures who had to leave continental Europe to pursue their lives and careers in Britain and then in the United States. The experience of exile forced them to reestablish themselves under different circumstances, to use different materials, and to reconsider their design approach. Analysing the works of László Moholy-Nagy, Marcel Breuer, Walter Gropius, Lucia Moholy, Ludwig Hilberseimer, Josef and Anni Albers, and Herbert Bayer, Schuldenfrei explains both the social impact of design and the connectedness of émigré circles.

This interview was conducted in Prague on 11 September 2024, on the occasion of Robin Schuldenfrei's lecture "Lucia Moholy—At Home at the Bauhaus" at the Kunsthalle, and is accompanied by images from and related to *Objects in Exile*.

Ágnes Anna Sebestyén: We are in the Kunsthalle in Prague on the occasion of your upcoming lecture about the photographer Lucia Moholy—a lecture organised in connection with the major monographic exhibition "Lucia Moholy: Exposures" held in the Kunsthalle between 30 May and 28 October 2024.*[1] *This is the perfect setting for the interview because Moholy is one of the protagonists in your book* Objects in Exile *and also a protagonist in your long-term research related to the Bauhaus, photography, and architecture. Speaking of the Bauhaus, I would like to refer here to your essay about the irreproducibility of the Bauhaus object in the book co-edited by you,* Bauhaus Construct *from 2009. (Saletnik and Schuldenfrei 2009) This essay is about the failure of Gropius's inten-

[1] Lucia Moholy: Exposures, *the first comprehensive exhibition on the life and work of Lucia Moholy, presented by the Kunsthalle Praha, 30 May–28 October 2024. Curated by Meghan Forbes, Jan Tichy and Jordan Troeller; in collaboration with Christelle Havranek (Chief Curator, Kunsthalle Praha). Robin Schuldenfrei wrote two articles in the accompanying book, see: Schuldenfrei 2024b.*

tion to merge art and technology; that is, to move from the production of individual, luxury objects to mass reproduction. You pointed out that now iconic Bauhaus objects were one-off luxury pieces intended to be subsequently mass produced. In this way, you called into question the mythological account of the Bauhaus's contribution to the trajectory of modernism, the socially transformative use of its designs by the masses. Then in 2018, you elaborated this subject in your book* Luxury and Modernism. *(Schuldenfrei 2018) And now, in 2024, with the book* Objects in Exile, *it seems you have come full circle as you argue that modernism gained coherence only after it passed through conditions of exile. So, what was only an idea, or a luxury, or speculative design in interwar Germany materialised under different circumstances later in the UK and then in the USA. I'm interested in your work as a researcher: how do you look back on this arc of research, for how long has* Objects in Exile *been on your mind?

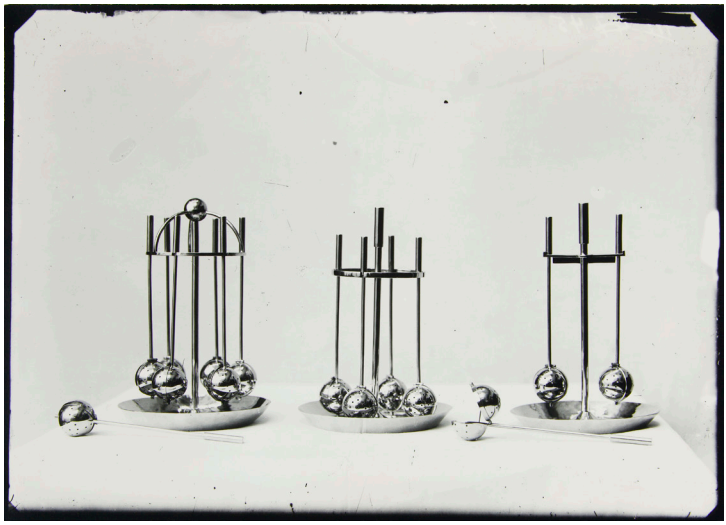
Lucia Moholy (photograph), Architect: Walter Gropius, Bauhaus Building, Dessau, 1925-1926: Detail of studio wing balcony, *1926, 18 × 13 cm (7 1/16 × 5 1/8 in.), gelatin silver print. Harvard Art Museums/Busch-Reisinger Museum, Gift of Ise Gropius. © 2022 Artists Rights Society (ARS), New York / VG Bild-Kunst, Bonn. Photo © President and Fellows of Harvard College, BRGA.20.56*

Robin Schuldenfrei: *Objects in Exile* departs from where *Luxury and Modernism* left off: the protagonists go into exile. Some of them fled the Nazis and needed to go into exile for their own safety. Certainly, Lucia Moholy was an example of such a fleeing refugee. Her then partner, Theodor Neubauer, was in her apartment when he was arrested by the Gestapo, and she fled that night taking only a suitcase with her. Others were economic migrants, who took the opportunity to leave Germany when they could no longer practise their modernism because their ideas were no longer welcome, and so they decided to leave and to take the opportunity to work elsewhere. Walter Gropius certainly would be an example of that. He was able to take his entire archive, all his objects, his own personal furniture, including the double desk that he and Ise, his wife, used and which had been specifically designed for them. And he was also able to take things such as the model of the Bauhaus building. László Moholy-Nagy also followed Gropius first to England and then to the US, where he led the New Bauhaus in Chicago. So, people's stories are different. But what the book really aims to examine is the way in which objects also went into exile, sometimes independently of their makers. In the case of Lucia Moholy, she left her entire collection of plate glass negatives of the Bauhaus when she fled. They were very large A4 size sheets of glass, so it was not easy for her to take them with her, so she asked her former husband, László Moholy-Nagy to take care of the negatives. So then, when she landed in England, she didn't have this body of work. We can also look at the way in which, with *Luxury and Modernism*, objects didn't necessarily reach their end consumers, because, as I argue in that book, they were, on the one hand, often just too expensive and on the other hand, were not attractive for the common man on the street due to their pared down simplicity. The latter half of the story of modernism is about understanding the ways in which these objects and also buildings became much more accepted. A good example of that would be Ludwig Mies van der Rohe, who was barely able to build anything in Germany besides a few beautiful houses. All his ideas for skyscrapers remained just that in Germany: ideas; but later, in the US, he was able to build many. So, I think that is a good example of the way in which going through exile and the processes of transfer made it possible for certain protagonists to bring their ideas to fruition.

ÁAS: There is a strong focus on Central European artists in your book with the geographic trajectories of Germany, England and the United States. How did you decide to follow this specific route of exile?

RS: One has to draw a boundary in some aspects of one's research project. I could have centred this project in many different places, I could have only looked at exiles from Hungary or Czechoslovakia. For this

László Moholy-Nagy, Six Flowers, *glass negative (broken) of 6 photograms (fgm 148, fgm 150-152, fgm 154, fgm 155), 1925-26, 18x24 cm. Photograph by Lucia Moholy. © 2023 The Moholy-Nagy Estate and Artists Rights Society (ARS), New York/VG Bild- Kunst, Bonn.*



Lucia Moholy, Stands with Tea Infusers *by Otto Rittweger (designer, executed by Wolfgang Tümel), gelatin silver print, 1925 (printed c. 1950 by the Busch-Reisinger Museum). Harvard Art Museums/Busch-Reisinger Museum, Gift of Walter Gropius, BR50.120. Photo © President and Fellows of Harvard College. © 2022 Artists Rights Society (ARS), New York / VG Bild-Kunst, Bonn.*

book, I concentrated on the people of the Bauhaus, but I wasn't interested in limiting it in a geographical manner. I wanted to see how these conditions, how these pressures of exile would change the trajectory of design – how going into exile would change both the person who encountered these new ideas and the country where they arrived. My books mostly look at Central Europeans and Germans who coalesced at the Bauhaus. We have László Moholy-Nagy and Marcel Breuer from Hungary, Herbert Bayer from Austria and many others who were not German; and also figures who were never formally at the Bauhaus but connected to it in another way such as Lucia Moholy. The Bauhaus was truly international. People came together and produced incredible de-

Wells Coates, Lawn Road Flats, London, 1934. Photograph by Ágnes Anna Sebestyén.

Marcel Breuer, Isokon Long Chair, plywood chaise longue for Isokon, 1936, Bent laminated birch veneers, bent plywood. Harvard Art Museums/Busch-Reisinger Museum, Purchase through the generosity of Claudia Oetker and Liliane Soriano, and Francis H. Burr Memorial Fund, Photo © President and Fellows of Harvard College, 1999.272

signs, works of art and architecture in just a fourteen-year period. It is a pivotal moment in history because you can see that ideas that were already circulating, certainly in Budapest, Prague, Stuttgart, and Paris, really came together at the Bauhaus in Weimar, Dessau, and Berlin. So, I think that one of Gropius's greatest achievements is to pull these ideas together and to connect art and technology, even though it didn't necessarily come to fruition in the pre-war period. Indeed, I argue in the book that it is really through the process of exile that modernism as we know it today could come to fruition. Of course, there was some American homegrown modernism, but it is really this incredible mixture in these vital years right before World War II that was decisive. Then, in

the post-war economic expansion in the US, people reemerged from wartime crisis into a post-war period of plenty.

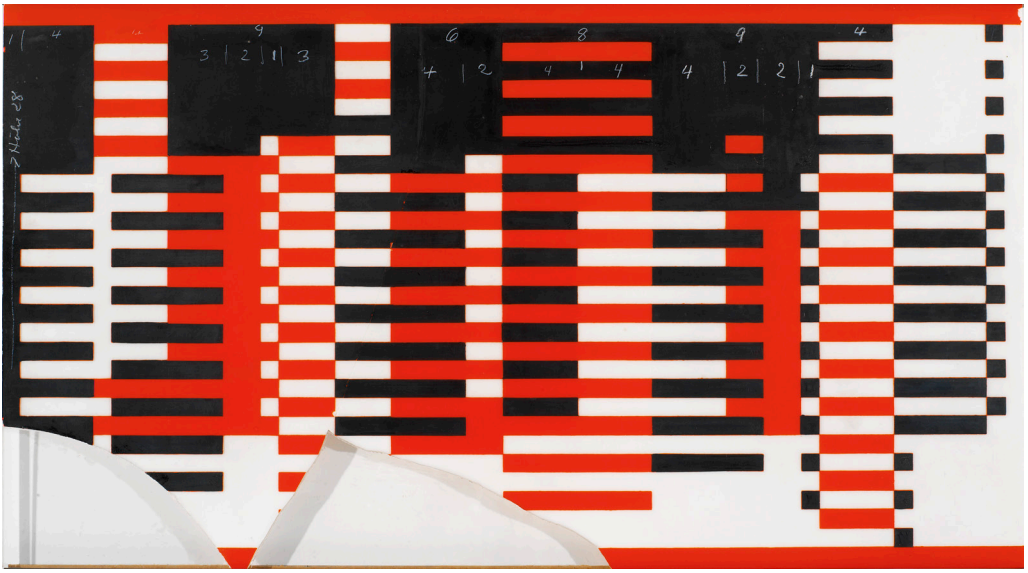
ÁAS: I also would like to ask you about London. Could you explain why the London period was so important as a transitional stage in between Germany and the USA?

RS: London was very important because, as I argue in the book, it became the place of translation for the protagonists. They were invited mostly by Jack Pritchard as part of his Isokon project.[2] Pritchard was also creating housing, so the émigrés could live at his block of flats, the Isokon building, also known as Lawn Road Flats. Gropius had worked on the idea of minimal dwelling, and at the Isokon building, he lived in a studio flat with his wife Ise. This one-room apartment was already furnished, so they could only bring light belongings to fit in that space, which meant that he could really try out his ideas. But I think he was surprised, because he had lived in a massive director's house at the Bauhaus in Dessau and then in a beautiful apartment in the Tiergarten area of Berlin. Gropius came speaking almost no English whatsoever, while Ise was well trained in English. Breuer and Moholy-Nagy also did not know English until they arrived in England. This is the first time that Gropius wrote down the story of the Bauhaus, and it got published as a slim volume titled *The New Architecture and the Bauhaus*, in 1935. They were trying out their ideas and translating them. Marcel Breuer's bent metal chairs became his plywood chairs because Jack Pritchard at Isokon was working with plywood, importing it from the Baltics. Breuer translated his tubular steel into flexible plywood, so a lot of the same forms and closely connected designs were materially "translated" for this new iteration. In the end, though, many scholars have viewed this time in England as a sort of failure; a failure of the English to really embrace modernism. I think a better way to see it is that extraordinary opportunities were then offered to these protagonists—from Harvard, the Illinois Institute of Technology (IIT), and the New Bauhaus. They took up these opportunities and the kind of security that America offered. So, I think overall this time in London was productive for them.

ÁAS: Speaking about this international group of protagonists, you also argued that modernism was better understood as transnational. Could you explain what you mean by that and how it relates to the exilic condition?

RS: It is not just a mix of an international group of people coming together, but the ways in which ideas are brought to new locations, and then also translated, connecting to things that were already in

[2] *The Isokon company was founded in 1931 by the English entrepreneur Jack Pritchard and the Canadian architect Wells Coates to design and construct modernist houses and flats, and to manufacture modern furniture. Isokon furniture was made from bent plywood, with notable designs including Marcel Breuer's Long Chair. The Lawn Road Flats in Hampstead, London was created by Jack and Molly Pritchard and Wells Coates to pioneer the idea of minimal dwelling in Britain.*



Josef Albers, City, *1928, Sandblasted opaque flashed glass with black paint (damaged), 13 × 21 3/4 in. (33 × 55.2 cm). Josef and Anni Albers Foundation, 1976.6.14. © 2023 The Josef and Anni Albers Foundation/ Artists Rights Society (ARS), New York. Photo: Tim Nighswander/Imaging4Art.*

circulation. So, I feel that there are certain moments where we are dealing with the idea of transfer, whether that is the transfer of materials or the translation of languages or the transfer of people and the way they interconnect to the places where they land—places such as London, and then Black Mountain College, Harvard, IIT, or the New Bauhaus.

ÁAS: You meticulously follow the life of your protagonists, but the human dimension is also present in your book in a way that these artists believed in modernism's social impact. Could you elaborate on that?

RS: Absolutely. One example is the way in which they decided to continue to live really modern lives. Gropius was invited to build his own house in Lincoln, Massachusetts, and used a lot of the same ideas, such as a flat roof and modern materials in his new American iteration, even if they were, in some ways, not necessarily appropriate for very cold and snowy New England winters. These modernists were also really good friends. Many of them gathered on Cape Cod during the summers, where they built modern houses in which they could kind of let their hair down and just enjoy being around each other. During the war years they created a Bauhaus fund to help their colleagues who were stuck in Germany to survive or to get out. There was a tireless letter campaign on behalf of members who were not able to get out and some of whom sadly did die in concentration camps. Others sent care packages—supply packages with things like coffee, powdered eggs, and powdered milk. During the tragedy of the war

period, this social network in the US was important both in finding solidarity and keeping up old ties while in a new land. At the same time, Gropius and Mies van der Rohe had large FBI files associated with them. Gropius was not free to travel; every time he needed to travel, he had to write a letter saying when and where he was going and when he would be back. So, they were not so free and at ease in America. I think they really did seek the camaraderie of their former friends from Europe when they were in the US. Gropius, for example, continued to be really good friends with the Pritchard family and he took in Pritchard's children in the US when London was being bombed. So, he was able to be really helpful to the Pritchards during the war while they had been helpful to him pre-WW II. These lifelong friendships were very important and part of the story in which modernism functioned as a network and how these people worked together in the post-war period.

ÁAS: And Moholy-Nagy and Bayer also contributed to the war effort, so it also adds to the story.

RS: Yes, I think that is really important, too. Not everybody contributed to the American war effort right away. Moholy-Nagy was trying to push his school towards useful ends and improve how design could help the war effort, how they could teach students about camouflage. He even had the idea to completely hide the Chicago lakefront, which has a very distinctive shape, so you wouldn't even know where the Chicago perimeters were, should the city potentially be bombed. So, Moholy-Nagy really tried to contribute a great deal to the war effort, as did Herbert Bayer with graphic design.

ÁAS: Speaking about exile and war, objects were also relocated. As you wrote in the introduction "This book is a history of objects' agency." So, how were the émigrés successful in bringing not just ideas, but also objects into exile? Or, what happened when they had to leave these objects behind in Europe? How did they cope with these losses, or sometimes gains, as well?

RS: I think that is a really important question because some figures like Mies van der Rohe purposely left their whole early oeuvre behind, because it wasn't important to them anymore. He focused on his modernism in the US and was not interested in making single family bourgeois houses such as the Haus Tugendhat. László Moholy-Nagy could not take all his paintings and many of his early, important constructivist canvases were destroyed by his own caretaker, who was sympathetic to the Nazis. Others, such as Lucia Moholy, could not take her glass negatives into exile and suffered in London in those years when

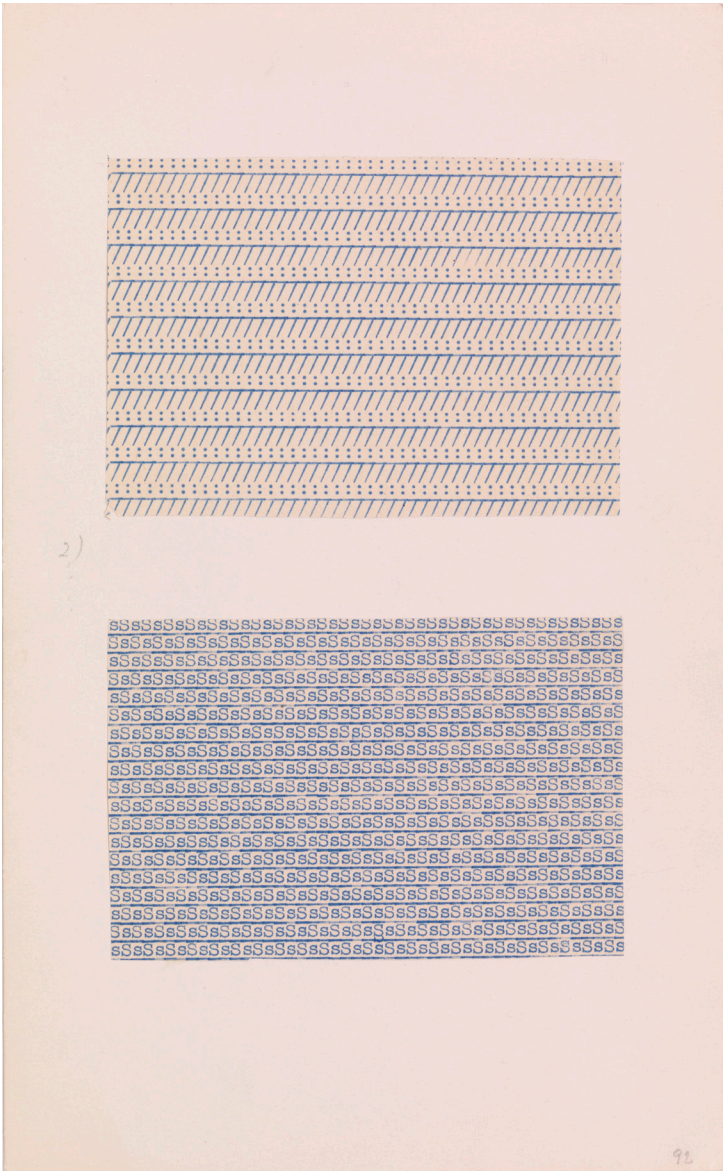
she was asked to give lectures on the Bauhaus because she didn't even have material to illustrate the lectures. Some figures, such as Gropius, were able to take everything with them and were able to create a new life with all at hand. Photography is particularly significant in this story because books became important. The Bauhaus exhibition catalogue of the 1938 MoMA (Museum of Modern Art) Bauhaus exhibition became the way in which modernism was taught. Though the exhibition was only up for a couple of months from 1938 to 1939, it lived on, especially due to the images that Lucia Moholy had taken in the Bauhaus, and which were published in the exhibition catalogue. A lot of the Bauhaus furniture couldn't be taken out of Germany so there weren't that many genuine Wassily chairs and there wasn't much tubular steel furniture in the US, but the photographs of them described them and people could see what a modern interior should look like. Ultimately, there's many ways in which an image can go into exile as much as an object can.

ÁAS: Speaking of Breuer's Wassily chair for example, it is a very characteristic feature in your book that you look afresh at canonical works. Your study includes big names like Breuer, Moholy-Nagy, Gropius, Bayer, etc. Did you have an intention to challenge the canon in a way, or to question the position of these objects created by these artists within the canon of art history?

RS: I have mostly worked on the larger names of the movement because I think there is no reason to be working at the margins when I am trying to challenge an argument or an understanding about the modern movement in general. If I can't make that argument successfully with the major buildings, the major objects, and the major protagonists of the movement, then I am just chipping away at what we know. But I think that it also opens the door for other scholars to do work in languages in which they are fluent, in materials that they know best. And certainly a book such as *Luxury and Modernism* could be written about Hungarian protagonists in Budapest in the same era or in Paris and so my book could have been enormous and covered six more countries. But I don't think you need to. I think you can set the stage and set the arguments and allow them to reverberate more widely from there. I think there is a way in which we can look at these key characters from the period and then leave the door open for future research and for ways of understanding this very rich period. And also, the local influence of different protagonists in different places is very important. Here we are in Prague, and we can see a kind of modernism that is absolutely part of this international style and yet there are these wonderful moments of discovery where you exclaim, "but this is Czech modernism," and you feel and see it right away,

whether it's the colour or a certain angle or a certain curve that is different than what you would see in Germany with its iconic, classic way of modernism.

ÁAS: We are both architectural historians, so I would like to address the direct or indirect architectural relevance of many of the topics inherent in your book. Like the case of László Moholy-Nagy, who was not an architect, but whose work was in many ways architectural. So, could you elaborate on how architecture penetrates your book?



Anni Albers, Studies made on the typewriter, n.d., Typewriter printing in blue ink on paper mounted on board, 10 5/8 × 6 5/8 in. (27 × 16.8 cm). The Josef and Anni Albers Foundation, 1994.18.4. © 2023 The Josef and Anni Albers Foundation/ Artists Rights Society (ARS), New York. Photo: Tim Nighswander/Imaging4Art.

RS: Though Moholy-Nagy didn't design interiors, installation architecture was important for him, and he also used media in a such a way that he created spaces with his work and with his ideas. We can also look at the protagonists of modernism in this period through the lens of media or media studies. I am in particular an architectural historian who works on objects. So, I look at the ways in which things are architectural, but not just through buildings, building materials and floor plans—there's hardly any floor plans in the book whatsoever, not because floor plans aren't important, it's just they're not important to the ideas that I want to explore with modernism and change how we understand the larger ramifications of modernism in this period.

ÁAS: What's next for your research?

RS: I am just at the start of some new research on the topic of architecture and migration. I hope to explicate the cultural value, conditions, and economics of migration through the study of objects and architecture.

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The Capacious Umbrella of Design Culture

An Interview with Ben Highmore by Márton Szentpéteri

https://doi.org/10.21096/disegno_2024_2mszbh

Disegno met with the leading British scholar of the culture of everyday life at a conference organised by the Doctoral School of the Moholy-Nagy University of Art and Design in 2023 titled *Designing Everyday Experience—Objects, Environments, Habits* where he gave a keynote address.[1]

[1] *Some of the papers from this conference, including Ben Highmore's, were published in* Disegno *2024 (1), special issue* Aesthetic Histories of Design Culture. *(Highmore 2024).*

Disegno: Our friend, Guy Julier has often told me that Design Culture Studies is an emergent scholarly endeavour. What do you think about that?

Ben Highmore: I suppose any healthy discipline is always emerging. When I think about design cultures today, I should first say that I don't really see myself as working *within* design cultures, strictly speaking. I'm a cultural studies scholar, but I also come from art history, from that moment when art history shifted from being a kind of connoisseurial activity about the great artists of the past to being interested in visual culture.

One aspect of that shift that was crucial for me was the emergence of design history at what was then Middlesex University. For me, it was visual culture and material culture together that became particularly important. I think of design culture as a very capacious umbrella: it includes some design history, but it isn't tied so strictly to the particular procedures and protocols that design history, as it's practised especially in the UK, tends to adhere to.

For instance, there's a lot of interesting cultural work on dress and clothing, on memories of clothing, on uniforms and what uniforms mean, on our relationship to the environment and to the rooms we live in. A couple of days ago, I did a radio programme with a British guy called Michael McMillan with family from St Vincent in the Caribbean.

He has developed almost a kind of cultural studies by practice. He's been bringing together all sorts of materials to recreate the West Indian front room, full of the kinds of things many Caribbean families in Britain had in the 1950s and 1960s as they were trying to make their mark in a very hostile environment.

He's been travelling the world—for example, to South Africa and the Netherlands—to look at what the "front room" has meant to diasporic communities. I see that as something really lively within the big field of design cultures, even though he probably wouldn't call himself a Design Culture Studies expert (see his website https://www.michaelmcmillan.uk/new-page-5). That isn't the field he'd say he works in. Likewise, some of the people writing about dress culture probably wouldn't see themselves as doing design culture either: they'd see themselves as experts in fashion and the body, or fashion history, or something like that.

Therefore, my answer is that the best, most lively design culture work often doesn't come under that title for the people doing it. But "design culture" is a very capacious way of addressing our culture of designed, found, and materialised forms—often in domestic settings.

***D:** In your paper (Highmore 2019) published in the anthology* **Design Culture: Objects and Approaches,** *a selection from the proceedings of the 2014 Kolding Conference* **Design Culture: Object, Discipline and Practice,** *you apply the notion "worlding" to describe the role of design culture experts, or those interested in this capacious notion and the corresponding research activities.*

For us in Central-Eastern Europe, "worlding" is clearly a Heideggerian notion, since we have all been trained in continental philosophy. But I'm interested in your background. Is Heidegger in the background for you?

BH: At the time I was reading a lot of Heidegger, and yes, it was coming out of Heidegger. But it was also shaped by how the term was being used by people we'd now think of as part of affect theory. There's an anthropologist, Kathleen Stewart, who was at the University of Texas at Austin, who uses the word "worlding".

I think about the way we create the world and the way the world creates us through what you might call environmental practices—not "environmental" in the sense of environmentalism, but in the sense of building a milieu that has a certain historical specificity.

It also relates back to Raymond Williams for me, in terms of cultural studies, where he talks about culture as a "whole way of life". That's a very anthropological idea of culture. He distinguishes between culture as the various items you might find in museums or libraries, and culture as a whole way of life.

He was referring primarily to his upbringing in a small village in Wales, where his father was a railway signalman. They were involved in the unions, and he's very particular about the neighbourly practices that went on—when his father was very ill, how neighbours felt obliged, but also wanted, to help out. But that whole way of life could also be contradictory. It wasn't a homogeneous activity where everything fitted neatly and had its place; it could accommodate lots of contradictions.

The work I was doing at that point, which led to the book I've recently (2023) published (*Lifestyle Revolution: How Taste Changed Class in Late 20th-Century Britain*), was about what was happening in the late 1950s, 1960s, and early 1970s in terms of a whole new array of material cultures, some of which were particularly designed.

For my story, Terence Conran as a designer was particularly important, as was his shop Habitat. It was about curating a lifestyle. "Lifestyle" can have a very thin meaning, as if lifestyle culture is just shallow—people who eat smashed avocado on toast because it's this week's thing. I wanted to fill that notion with more objects, but also with the dreams, desires and imaginations that went with them. That was the idea of "worlding" for me.

Rather than thinking that taste culture meant you *must* have your Habitat furniture, your Italian lacquer table, that you must eat Italian cuisine and wear clothes from Biba, I was trying to get away from that checklist. Many of the worlds we inhabit are shown to us in a fairly pure state—sometimes in magazines, sometimes in shops. You go into IKEA today and they show you whole tableaux of the life you should have. But what we actually do is approximate those sorts of things, and we do that in lots of different ways.

What's important is not that we have *all* the things—that you must have a red enamel mug, that particular brown teapot, or that particular kind of chair. You might have several things that approximate them, but they can still work as cultural relays. They work from one to another and help build up a sense of a world.

The particular world that Conran and others imagined was itself contradictory. It could have ultra-modernist elements, but it could also have lots of what we would now call retro elements. It was about eclecticism. And it had that strange quality of being about mass production—at the height of Habitat's success there were something like eighty-four shops across the country—but you couldn't say you embodied the "Habitat world" simply by shopping in one place. You also had to show your quirky character by having old adverts from the 1920s, bits of "wacky" furniture, things you'd picked up second-hand, hopefully for very little money. That was part of it.

I see that the world very much continuing in the present. I think you see it most clearly in cafés, restaurants and pubs in Britain: you go in and there are mismatched chairs, strange photographs where you

think, "That's really odd, I can't quite make that out," a bare brick wall, some old church pews. It looks casual, but it's a very carefully formed casualness. It encourages improvised sociality, but there's also a sense that these things are rehearsed improvisations.[2] That's how I was thinking about worlding, really.

[2] *In Hungary,, so called "ruin pubs"* (romkocsmák) *are of a similar kind (–eds.).*

D: Heidegger is quite controversial and I'm not entirely comfortable quoting him. What do you think about Heidegger's philosophy, and especially the way it seems completely natural for many philosophers of design or cultural scholars dealing with design to refer to Heidegger without scruple?

When you try to go deeper into his philosophy, it becomes more and more clear that the entire composition is deeply problematic. It's not just a superficial issue that he belonged to Nazism; the entire construction can be dangerous—especially if you think about such ideas as "Earth".

I don't know whether you know Karl Jaspers' philosophical biography (1957), in which he clearly compares some of Heidegger's key notions to what actually happened in those years in Germany.

BH: I got into Heidegger through philosopher friends of mine in Estonia. They talked about how, as communism fell, you could see Marxist–Leninist philosophers marching out of the doors of the university—or being pushed out—and then, a few weeks later, you'd see them on the checkout in the supermarket. And then in came the Heideggerians; it was almost a sea change in philosophy.

I was encouraged to look at Heidegger, partly because I was interested in people like Michel de Certeau and so on. My reliable knowledge of Heidegger is probably about twenty pages of *Being and Time* and various essays that are exegeses on those pages—around notions like "being", "thrownness" and so on. I do know the critiques, and I'm completely sympathetic to the idea that Heidegger's thought is deeply related to a kind of ethno-nationalism. I really accept that.

I do think, however, that ideas like "thrownness" are a useful form of phenomenology to talk about all sorts of things. And I think many people using Heideggerian concepts today have not spent a lot of time with Heidegger himself. For me, the person who influenced me most was the legendary media scholar Paddy Scannell, who used Heidegger to talk about radio, television and everyday life. It's a really useful adaptation of Heidegger. The term he takes most from Heidegger is "care"—not care in the sense of health-service care, but attentiveness, the making of things.

So those ideas have been important to me, but I also feel no great desire to go back to Heidegger and read harder, to get more serious about him.

D: I just wanted to know your views on this because Hungary was different from Estonia. Estonia was in the Soviet Union. After—and because of—1956, we were "the happiest barrack of socialism", which meant that especially in the 1980s things were much easier than in Estonia, and almost no one was fired for political reasons.

At my alma mater, what happened to the Marxists? They left and came back, and the Marxist–Leninist Department became the Metaphysics Department. I think that's quite funny. We had a hodgepodge of everything. Marx and Marxism were thrown out often by former Marxists, which also affected critical cultural studies: no one was really interested in it because it was seen as Marxist, at least for a while in the 1990s.

Anyway, I still can't really figure out how to talk about objects, things, beings, tools and so on without some of Heidegger's most important thoughts. But I was shocked when I realised that all these key understandings in his philosophy are rooted in his hyper-nationalist understanding of the world solely "for the Germans". The real philosophical "Greece" to him was the Nazi Germany for a while then he became disappointed with even Hitler who seemed ignorant of Heidegger's "high Nazism".

Does that mean the use of Heidegger is always ethno-nationalist? No, not at all. My problem here is similar to the case of Jorge Luis Borges, who was an anti-fascist who grew old, disappointed, with no Nobel Prize—while many authors influenced by Borges like Gabriel Garcia Márquez did receive the prize. Borges, almost completely blind and disappointed, in 1976 went to accept the honorary doctorate of the University of Santiago, Chile and the decoration by the government (Orden de Mérito de Bernardo O'Higgins) during Pinochet's rule.

That was one of the key issues we discussed at the beginning of my university years in the Department of Aesthetics: whether Borges's poetry and stories are influenced by that episode or not. We usually said: who cares about this Pinochet episode at the end of his life? But I was never totally convinced about how to separate the work from the person, especially when authors are recent. With Aristotle and Plato, their political views feel more distant; but the Heidegger issue is still painfully with us.

It's especially relevant to how he was first understood in the United States, thanks in part to Hannah Arendt, who promoted Heidegger without really telling the world who he was—perhaps because she was in love with him, in a sense. Then the "shock" came in the late 1980s with Farias's ([1987] 1989) not-very-good but eye-opening book. I was at the beginning of my university studies then, and we were confused. We naively wanted to learn what was given to us, but

half of our professors asked questions about* The Origin of the Work of Art *(Heidegger [1950] 2008): "What do you think about this Nazi author?" And some of us wanted to say: "Can we talk about the work instead?"

So, when I talk to my students about tools, readiness-to-hand and so on—all those important notions that help us explain the world around us—I always have this second thought.

BH: Yes, I see what you mean. For me that kind of revelation, slightly later perhaps, came around Paul de Man. When his antisemitic journalism came to light, it sent a real shockwave through the academy.

It's interesting to look back now. Partly we might ask why we were so surprised. There is a lot of fascism around—why *wouldn't* a Yale literary professor have had a fascist or antisemitic past? Why wouldn't someone else have flirted with white supremacism when they were younger?

We often have this idea of purity around intellectuals, and I think that's a myth. I tend to think we're all pretty horrible deep down. Someone once said that when you look at people's dreams, there's always a bit of a Nazi in everyone, in terms of their worst desires. Was that Woody Allen?

Having said that, I'm still a fairly optimistic person.

D: Nietzsche said that if you look into the abyss, the abyss looks back at you, or something similar. Thank you for your honest answer; it is rare to be able to talk about this honestly.

BH: It's a really live intellectual issue. For instance, I recently found out that at the University of Edinburgh the main tower used to be called the David Hume Tower. It isn't anymore, because David Hume is no longer considered someone we can look to as an intellectual guide: someone found material where he isn't exactly excusing slavery, but he describes it as a civilising practice at one point. I don't know the exact details. Of course, Hegel's concept of race is also extremely problematic, and he said abominable things about non-Europeans.

So, it's a live issue. We want to maintain the moral and political standards of today. But at the same time, we don't want to throw away everything we've found valuable on the bonfire of today's particular sensitivities, even though those sensitivities are hugely important. It's a dynamic issue.

D: Talking about dynamic issues or ahistorical dilemmas, my next question is about the "critical" aspect: to what extent do you see this in cultural studies?

What do we mean by "critical"? For me, the question I asked about Heidegger is a critical question. But I once read in your bio on the University of Sussex website that you're described as a critical theorist. What do you mean by that? Is it Birmingham or Raymond Williams? Is it Frankfurt? What sort of tradition?

BH: Yes, it's an interesting and quite complicated area. At the moment, there's also a whole body of work I'm interested in that calls itself post-critical. So, it's important to ask how you locate yourself within traditions aligned with Marxism, for instance, where "critical" might mean a Marxist critical perspective, or within feminism, where that's also a critical perspective.

Straightforwardly, Raymond Williams has always been a really important orientation for me. Equally important is Walter Benjamin. For a while, what was important to me were people who are probably thought of as critical theorists, although they don't belong narrowly to the Frankfurt School tradition.

People like Benjamin and Williams don't seem to come with a position already ascribed. When you read Benjamin—*The Arcades Project* ([1982] 2002) or his essays—you can't predict what he's going to say. Sometimes I think I can't predict what my daughter is going to say. That sense of unpredictability is important.

Adorno's complex negative dialectics do a very useful job, but for me they tend to do the *same* job over and over again. In contrast, you can't predict what Benjamin is going to say about something.

I think many people want from critical theory a framework whose positionality is already known in advance: how you will approach something, what your points of critique will be—whether around certain ideas of globalisation, or the national, and so on.

Recently I've become more attached to the idea that the theory that informs me is not something I deploy or mobilise as a framework; it's something that has already sensitised me. I've been reading it for years and years, so I'm already sensitised by it. It's not a grid I then place on things.

I like to think of myself as a historian who tries to get *in amongst* things, in a fairly agnostic way, when I'm writing about the 1950s and 1960s and what we call the new middle classes. I didn't want to begin with:

"I'm going to absolutely nail these people. Since their tastes are awful. They've really bought into consumerism."

The people who informed me about consumer culture—Jean Baudrillard, Henri Lefebvre, and Roland Barthes to a degree—were from an older generation, older than my parents. As they were becoming intellectuals, they saw the colonisation of everyday life by the commodity, to use Lefebvre's phrase.

By the time I was born, that had already happened. I didn't have that perspective and I didn't particularly want it. I didn't want to stand outside and look down, pointing out everyone's mistakes—that kind of critical position. So, I wanted to go in amongst things in an agnostic way and look at them as they were happening, and *then* afterwards ask: what problems exist here, and how might critical theory help?

The most useful critical theory for that purpose was the theory emerging alongside those developments. So, people like Stuart Hall, writing about classlessness in the late 1950s; Raphael Elkan Samuel, looking at the politics around new political parties at the beginning of the 1980s; and others such as E. P. Thompson and—I'd add—people like Richard Hoggart.

D: To what extent can this critical attitude be seen as political? How close are you to practice in this sense? For example, my Oxford professor, Howard Hotson, who is a distinguished early-modern scholar and a good friend, says that historians take one step back and have a different view on what is going on. He says that this distance is enough as practice, because it can change how others see the world. But of course, critical theory is often closer to political action—not necessarily party politics, but real activism or intellectual activism.

BH: As a professor of cultural studies, I'm in a field that has always claimed to be as much a political project as anything else. Sometimes the problem is that when people hear you say your practice is political, they have a particular sense of time in mind: they imagine it must be *immediately* responsive and that you're giving guidance for the present—"What should we do now?"

Stuart Hall, one of the greatest cultural studies scholars ever, once said that the time of cultural studies might be *delayed*: it might take a long time for certain effects or practices to emerge. So, temporality is important.

I want to be responsive to the world, but I don't want to be merely reactive. I don't want simply to react.

In terms of politics, one of the things I'm interested in is how some of the historical work I've done—for instance on playgrounds—is not a Rankean history (see Highmore 2024). I'm not simply telling a story because it hasn't been told. I want to think in terms of "usable histories". By that I don't just mean "learning from our mistakes", but that there is something unfinished out there, still being worked through.

So, the whole history of experimental playgrounds, for me, is unfinished business. It isn't over, and there's a rich politics that is still usable.

On another front, I've got a book under contract called *Vehement Experiments: Imagining the Humanities at a Time of Competing Catastrophes*. It's about how we do humanities when, on the one hand, the world seems about to burn, and on the other hand the politics of race,

class, sexuality and gender seem to be pulling us apart. How do we think about our work in that context?

Clearly, I haven't finished that book, so I don't fully know the answer. I suspect the answer is actually quite modest. But it does involve thinking about your political commitments and what they mean.

One of my political commitments is influenced by the feminist philosopher Kate Soper, who has written about "new hedonism" and is involved in the degrowth movement. (Soper 2020) Her response to climate catastrophe is that we have to degrow. Not everyone, and not at the same rate: some countries still need to grow to reach a certain level of wealth and capacity. But the wealthy West needs to degrow.

No one will accept that if it's sold purely as loss—you're going to miss out on your computer games, your endless ability to consume. So, it has to be thought of as a *new form of hedonism*, a different kind of enjoyment. I'd like my work to be aligned with that, as well as with what I see as these competing emergencies.

I call them competing emergencies because they can be so deflating: if you're working on climate change, someone asks why you're ignoring racism, and so on. The impossibility of responding to all these emergencies, all these different calls on our attention, really demands humility and modesty about what we can achieve, and an openness to others who are doing the work around racism, around trans lives, and so on. It's very complex.

D: Yes. I remember your* "Sideboard Manifesto"—a sort of introduction to the first reader of Design Culture Studies,** ***where you say that design culture is too complex—but that this cannot be an alibi for not dealing with that complexity. (Highmore 2008; for Hungarian, see Highmore 2014.)

My last question is about the total aestheticisation of the world, or "design capitalism" if you like, in a negative or pejorative sense. We were touching upon this after Anders's paper (Munch 2024), talking about the idea that design was born almost by accident when the culture industry emerged from different totalitarian, romantic and avant-garde projects of merging art and life (see also Szentpéteri 2019).

***There is still a lingering understanding—at least in the Euro-Atlantic part of the world—that design culture is complete: everything is designed, even suffering is designed to be pleasurable, and our consciousness is totally designed, like in* The Matrix.**

I remember you said yesterday, in one of the discussion panels, that you're not simply "against capitalism", and that you don't think this aestheticisation is totally wrong. So, what do you think about these tendencies of diffuse aesthetics, aestheticisation, and this "matrix" of design capitalism in which we live? Some people say that Design Culture Studies, as a critical endeavour, can be a tool—the

red pill—against this total aestheticisation.

BH: Yes—the blue one, the red one! Just to be clear: I didn't say I was *for* capitalism either.

We were also talking about Hal Foster in relation to Anders's paper. Peter Bürger made a similar argument to Foster, probably at around the same time—in the mid-1980s. In *Theory of the Avant-Garde* (Bürger [1974] 1984), he suggests that the critical avant-garde could be seen as the research and development department of advanced capitalism: they're doing the intensive work of experimenting with new forms and products.

My position tends to go back to Lefebvre again. Around 1956 he talks about "the controlled society of bureaucratic consumption". He describes his wife coming back from the supermarket with a bottle of bleach and saying something like, "This really does clean better," mimicking the advert. That's the moment he realised the commodity had totally colonised everyday life—it had worked its way into houses, into consciousness, into dreams.

My position has always been that I don't really buy these totalising accounts. At the start of *The Practice of Everyday Life* ([1980] 1984), Michel de Certeau talks about Foucault's grids of discipline and knowledge becoming tighter and tighter, subsuming us. De Certeau says, yes, I can believe that—but at the same time there's a residue, something else. We are never *only* the playthings of power and desire.

If we really were reduced to an aestheticisation of everyday life—if we were simply simulacra of the commodity—I don't think I'd do what I'm doing. I'd be too pessimistic to bother writing and critiquing.

The question of aestheticisation also came up after Yuriko Saito's talk. There's a problem when we say we're not going to make aesthetic judgements; we're just going to use aesthetics descriptively; and then we say we're against the aestheticisation of politics or of poverty. We need to separate those uses out.

We might need a different word if we're going to use "aesthetics" to describe alienating packaging, beautification, and "nicification". Otherwise, it paralyses us: you can't talk about grief aesthetically, even though I'd like to talk about the aesthetics of grief—the phenomenological, sensual aspects—without feeling that I'm turning it into a commodified experience. So, it's partly a linguistic problem.

For me, the most interesting aspect of "design capitalism" isn't so much material design as the design of the virtual realm. There's clearly work to do on how our worlds are being shaped, particularly around subjectivity, on social media and the requirement for affirmation.

Everyone needs affirmation: you do a good seminar, and it feels great for a while, then the next seminar isn't so good, and you lose that affirmation. But we don't need the kind of affirmation where 300 likes on social media are necessary for something to feel meaningful.

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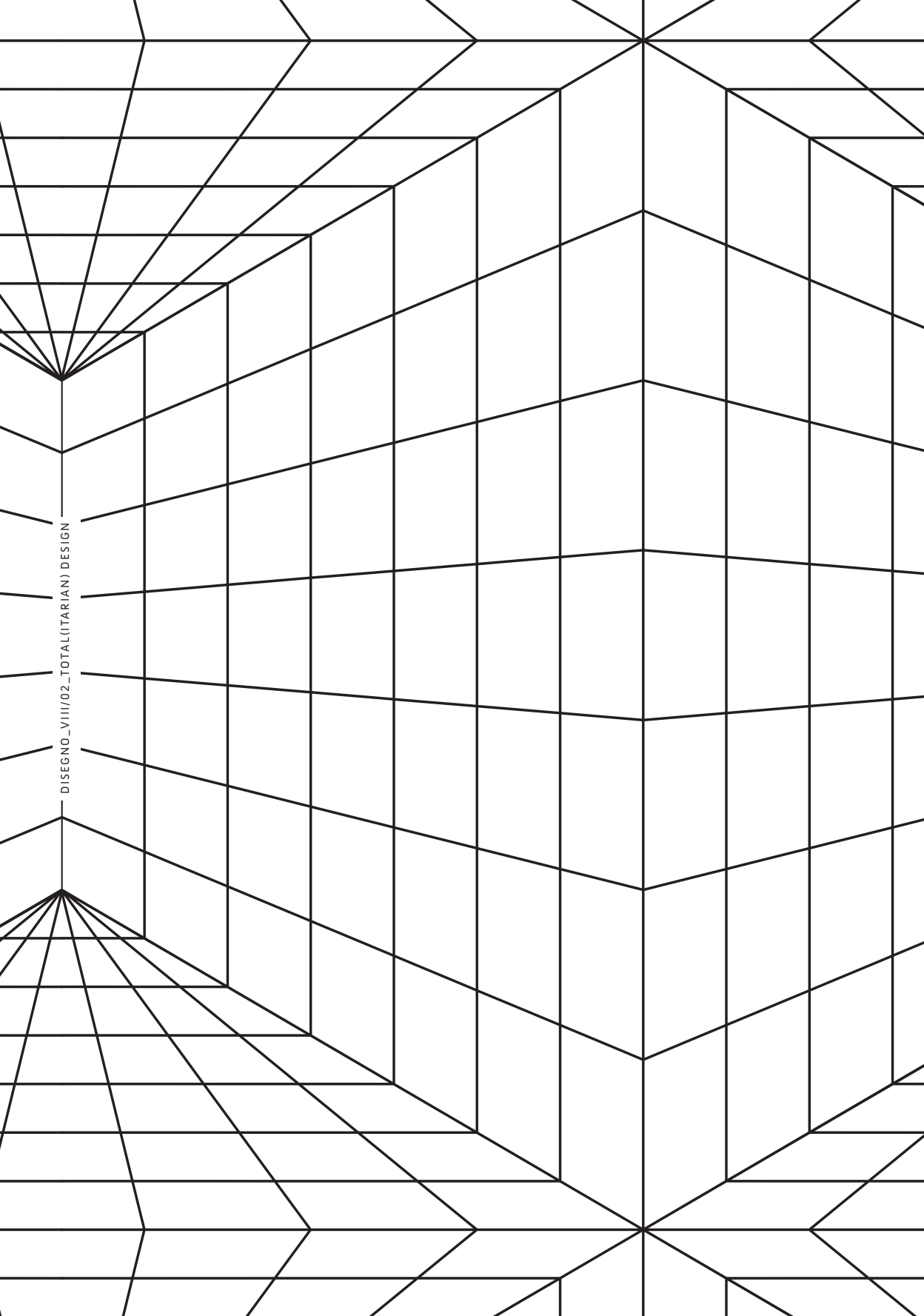
DISEGNO_VIII/02_TOTAL(ITARIAN) DESIGN

Calculating Empires, Fog of War, Zelda and Navigating in Post-Ideological Networks

An Interview with Vladan Joler by Ábris Gryllus

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Ábris Gryllus: You recently conducted a workshop at MOME, where you collaborated closely with students on your project Calculating Empires. I would like to address this project in our conversation; however, I would like to begin from a broader conceptual standpoint—namely, the question of classification. I have several questions related to this theme, and my first one is not necessarily directed at Calculating Empires itself, but rather at how you define your own practice.

When one encounters your work online, it is often described through the lens of critical cartography. I am interested in what this term signifies for you. Cartography is commonly perceived as a neutral or objective practice—an instrument for representing space without ideological mediation. Yet, as we know, such neutrality is largely illusory. Within this recognition of cartography's inherent non-neutrality, how do you understand and position your work in relation to the notion of critical cartography?

Vladan Joler: I didn't really come to identify as a cartographer through formal studies or any official program. It developed more gradually, as a practice over time. I started somewhat incidentally, investigating invisible infrastructures or hidden layers behind technology. Step by step, the drawings and schematics I was producing began to resemble maps. At some point, I thought, "Okay, this looks like a map—maybe this is cartography."

Part of what I call critical cartography stems from the fact that most maps we encounter are created from positions of power. Cartography, historically, has been closely tied to political and military structures—in many ways, a tool of authority. Such maps assert control: "This is my empire, my territory, my domain."

The maps I create take a very different perspective. They emerge from the position of an individual outside the machinery of power, navigating unknown structures and hidden relations with a small torch or lamp. Through this process, I illuminate phenomena and relationships, mapping them in a way that tries to make sense of complex realities.

Initially, my work consisted of smaller diagrams—for example, showing how surveillance operates in Serbia, or how different algorithms and processes function. Over time, these maps expanded, growing in scale and ambition. My most recent work, for instance, measures about three by twenty-four meters. At this scale, the maps begin to approach the limits of human perception—the limits of our ability to research, visualise, and structure knowledge. This, fundamentally, is why I call it critical cartography.

I also occupy a somewhat ambiguous position in this work. Sometimes I am recognised as a designer, sometimes as a media theorist, investigator, or artist. I find this ambiguity liberating, because it allows me to experiment across methodologies: scientific, artistic, philosophical—philosophy itself being a method for pursuing truth. I enjoy these non-positions, the non-binary, non-linear, unclassified space they create.

The paradox, of course, is that what I am doing is ultimately an act of classification. Maps are, by nature, ways of naming, organizing, and relating things. And yet, personally, I find a certain pleasure in remaining unclassified myself.

ÁG: If we stay with the notion of maps, there seems to be an important distinction between data visualisations and maps. Data visualisations often aim to provide insight or reveal patterns, whereas maps are traditionally understood as tools for navigation. How do you relate to this distinction? What kind of navigational function—whether literal or conceptual—do you think your maps provide?

And, in connection to this, I would like to return to the question of your practice as something that resists easy classification. Your work engages with visualisations and various articulations of data, yet their meaning and function seem to shift depending on context. I find it particularly interesting how you play with this contextual fluidity—how the significance of a map or visualisation changes according to where and how it appears. But perhaps we can return to the idea of navigation: in what ways do you see your work offering, or perhaps questioning, a form of navigation?

VJ: In the early stages of my research practice, I focused primarily on data visualisation. I used it as a tool to make visible what was otherwise invisible to me. Much of my work involved investigating data flows, algorithmic structures, and process networks, and visualizing that data became a way of seeing—of understanding systems that are otherwise hidden. The process typically starts with finding a way to extract data from the world: from systems, data centres, websites, or any domain under investigation. Once extracted, the data is transformed into something perceptible, because until then, it exists only as numbers. After visualisation, I can begin to ask questions: what does this actually mean?

Over time, I realised that data visualisation is far from neutral. Repeated practice taught me that every choice in the visualisation process—how to structure, represent, or emphasise the data—fundamentally shapes what you see. In that sense, the person visualising the data is not a neutral agent simply presenting objective facts; they are a storyteller. Every visualisation is a form of narrative, a decision-making process that frames the interpretation of information. This insight shifted my focus: I began to think less about visualisations as neutral tools and more as instruments of storytelling.

Gradually, my practice evolved beyond pure data visualisation into conceptual mapping—what I would describe as cartographic storytelling. I became increasingly interested in interpreting the shapes and patterns emerging from these visualisations, in reading the hidden power relations embedded in networks, and in understanding what the diagrams reveal about the structures they represent. Over time, my attention moved from raw data to broader sources: books, historical materials, conceptual frameworks—the kinds of knowledge that go beyond immediate digital flows.

There is also a strategic dimension to this work, which involves appropriating the aesthetics and techniques of maps as tools of power. In some ways, I see a connection to practices of the Yugoslav neo-avant-garde, groups like Neue Slowenische Kunst, or Laibach—artists who engaged with the aesthetics of power and authority. In my work, I use the visual language of maps, often associated with military or state power, to tell alternative stories. In other words, I employ maps to critique maps, and the aesthetics of power to critique power itself. This is what I think of as counter-mapping or counter-cartography.

There is also an interesting tension in how people perceive visualisations: if something looks like a data visualisation, it is often assumed to be objectively true. I play with this expectation, structuring stories, ideas, and critiques in forms that resemble diagrams, maps, or networks. In doing so, I am engaging with a lineage of cybernetic and systems-based drawings from the 1960s and 1970s, in which the planet, societies, or technologies were represented as complex systems of feedback loops. My work intersects with these traditions, using dia-

grams and shapes not simply to illustrate systems, but to interrogate them, question them, and tell alternative stories.

ÁG: Earlier, you mentioned that you sometimes feel as though you are reaching certain perceptual horizons. I find this idea particularly fascinating, especially in relation to the notion of the map. Historically, maps have always been bound to the technological and epistemological limits of their time. For example, in some of the earliest maps—such as those attributed to Cosmas Indicopleustes in the sixth century—we encounter this literal horizon of knowledge: beyond the known world, the mapmaker would inscribe "heaven," or even depict mythical creatures such as dragons.

These inscriptions mark not only the limits of geographical understanding but also the worldview of the mapmaker—the point where empirical knowledge ends and imagination begins. I find this parallel compelling in relation to your work: you also seem to approach a kind of horizon, a point at which the complexity or scale of your maps reaches the limits of perception. I'm very curious to hear how you think about this threshold—what lies beyond it, and how you imagine or conceptualise what cannot be fully mapped.

VJ: In games, there's this concept of a "fog of war." For example, in games like *Age of Empires* or *Civilization*, the world starts as a blacked-out map. As your explorer moves through the terrain, it gradually reveals what's hidden, lifting the cloud over previously unknown areas.

ÁG: There is also Farocki's video essay* Parallel II*, which engages with the concept of the fog of war. I would like to return to this idea, particularly in its highly technological dimensions. Today, one could argue, the fog of war exists even within the realms of quantum physics and advanced computational systems.

In relation to your own work, which often takes the form of narrative or investigative mapping, I am curious: where do you encounter the fog of war? In other words, where do uncertainty, opacity, or uncharted complexity emerge within your maps and visualisations?

VJ: I think our "fog of understanding" today is multidimensional. We are living in an almost absurd situation: access to knowledge has never been greater. We can reach any information imaginable, at unprecedented scale and resolution. And yet, at the same time, our philosophical and conceptual frameworks are collapsing. Even though everything is available, it often seems like nobody cares—or that it's no longer considered important.

We are, in a sense, living in a post-truth reality: all information exists, but its significance is constantly undermined. I find it fascinat-

ing—and somewhat alarming—how access to information, rather than clarifying truth, can destabilise our understanding of reality itself.

This is especially evident in recent investigations I've conducted in Serbia, where the state is in decline. In this context of post-truth politics, citizens increasingly take on the role of investigators, the ones who must collect evidence and verify facts themselves. It's a complete inversion: the system no longer safeguards truth, and the responsibility of truth-keeping has shifted to individuals. In such conditions, the act of observing, mapping, and documenting becomes not only a research practice but also a civic necessity.

ÁG: I think this is particularly evident in your* Calculating Empires *project. You take these raw assets of information and, again returning to the theme of classification, organise them in ways that generate new forms of understanding. For me, the work has an almost encyclopaedic quality.

It also brings to mind parallels with Aby Warburg's attempts to classify art history in innovative ways. I wonder if you see a connection here, as I perceive a similar approach in your practice—an effort to create new systems of organisation and meaning, revealing patterns that might otherwise remain hidden.

VJ: You can think, for example, back to *Calculating Empires*. I remember when we were working on it several years ago, a friend of mine just came by and, seeing what we were doing, said in a second, "Ah, is this some kind of new visualisation of Wikipedia?" And I was like, no, no.

This highlights an important difference. Today, data and information are everywhere; everything is quantified, catalogued, and available. But what's often missing is a critical reading of that information—an understanding of how all these pieces interact. In a sense, this is what we tried to do with *Calculating Empires*: to create a new form of critical reflection on 500 years of the relationship between technology and power. It's risky work because anyone attempting to reinterpret history in this way is bound to be "wrong" in some sense. But you start from that understanding—that it will never be fully accurate—and then try to work with the information you have to generate new ideas, new theories.

What's interesting is that *Calculating Empires* is not just a huge collection of events and technologies organised into a timeline. It's much more than that. The work contains multiple forms of organizing information. Sometimes it's precise—a quote from a book with a year and an author. Other times, it's a highly abstract diagram, emerging from our own conceptual experiments. As a viewer or reader, you surf through *Calculating Empires*, moving between the highly precise and the deliberately fuzzy. Each moment offers a different kind of engagement, and different people will interpret it in different ways.

I like to see *Calculating Empires*, as well as some of the previous maps like *Anatomy of an AI System*, more like a space—more like an open-ended game, such as *Zelda*, where you explore and experience things at your own pace. This is what I find fascinating about maps as structures: they can serve as non-linear storytelling devices, spaces you can immerse yourself in. Unlike a movie, which has a beginning and an end, these maps are open-ended, exploratory environments where the experience depends on how you navigate them.

ÁG: Visually, this work operates within a two-dimensional space, with one axis representing time and the other structured according to classification. Could you elaborate on the principles or rules you established for yourself in organizing the work along these axes? How did you determine the relationships between temporal progression and categorical structure?

VJ: So basically, if you deeply examine the structure of Calculating Empires, you'll see that it actually contains different kinds of maps. One of them is a history of communication and computation. This map follows, in a way, the backbone of *Anatomy of an AI System*. It starts with a device—maybe something you hold in your hand or interact with in your daily life—and then dives from the interface into infrastructures, into data analysis, data storage systems, and data classification systems. From there, it moves to algorithms that process and analyse data, and finally to the computational devices currently performing these operations. So it's like an extended anatomy of devices, but spread over 500 years.

Another map shows how the history of these infrastructures, media, and computational devices intersects with and is shaped by different forms of power. This map has a different kind of classification. We start with time as an axis, then explore, in a Foucauldian sense, systems of policing, the body, borders, and education. We move deeper into political structures, culminating with the military. These maps reflect one another, offering multiple perspectives on similar processes.

Creating this work was an intense, four-year experience. Every day, you wake up and enter this enormous space of information, spending hours playing with it, adding details, and creating structures. Then the next day, you might explore another part of the map, diving into entirely new topics. It was extreme, but in a way very rewarding—a process of immersing yourself in a wide spectrum of subjects.

ÁG: Earlier, you also mentioned that your work is deeply intertwined with questions of political power. Indeed, political structures and authority seem to permeate virtually every aspect of the topics you explore. Could you elaborate on how these dynamics shape your work, both conceptually and in terms of its visual or structural form?

VJ: It's really interesting that even the previous maps were considered political, but in *Calculating Empires*, the political dimension is much more overt—it's right there on the surface. Half of the map is essentially about power, policing, brutality, and the history of all of that. But in a way, even *Anatomy of an AI System* is political, though it's not immediately obvious. Works like *Facebook Algorithmic Factory* and others are also political, but in a subtler way—they reveal the underlying complexities. Once you understand the complexity of power and the relationships operating behind screens or devices, the political dimension becomes clear, because you become aware of what is happening beneath the surface.

Usually, we are pushed toward a very superficial understanding of the world. We are constantly presented with simplicity and metaphors. For example, we hear about "the cloud" or "the internet," and behind that simple metaphor lies complete chaos: cables, power structures, military systems, barbed-wire fences—everything, really. It's just called a "cloud." Once you start revealing these kinds of complexities, that's when the maps become political, because they expose the deeper realities that are otherwise hidden.

ÁG: You also mentioned the current situation in Serbia. I am curious: after undertaking this work, do you feel that you have gained a deeper understanding of these real-life circumstances, which are unfolding so close to you? How does your research and mapping practice intersect with or illuminate the complexities of such contemporary social and political realities?

VJ: Almost immediately, maybe a year after we finished *Calculating Empires*, there was this political or student uprising in Serbia. It was completely unexpected, both ideologically and practically—nobody anticipated it. I started thinking a lot about whether, after four intense years of studying power relations and trying to decipher them historically, I could better understand what was happening now.

And the answer was yes, in a sense. I could see the student movement as a kind of assemblage, a mosaic of different organisational structures that had existed before. What we were seeing was a strange mix: a Gen Z, post-ideological, networked generation diving into historical forms of organising. They were moving from a networked super-individuality toward some form of collective being—swarms, assemblies—forms of organisation that originated perhaps 100 or 150 years ago. They were blending ideologies and organisational models in completely new, unexpected ways.

For me, this revealed a kind of fluidity and collapse of traditional ideological positions. In the way many "boomers" understand the political spectrum, we think linearly: there's left, right, centre, extreme

left, extreme right—maybe a one-dimensional spectrum, or at most a two-dimensional extension. But what is happening now in Serbia seems to collapse that entire framework. The movement isn't interested in left or right; they're not constrained by traditional ideologies. They are looking for what's common across all positions.

They've found common denominators in things like the rule of law, accountability—concepts that might sound traditional or even boring, but are being reinterpreted in a completely new way. It's a radical reframing: "Forget the compass of left and right. Let's imagine what a different ideology could look like." For me, that's both fascinating and extreme as an experience.

ÁG: It is a tool for navigation, then.

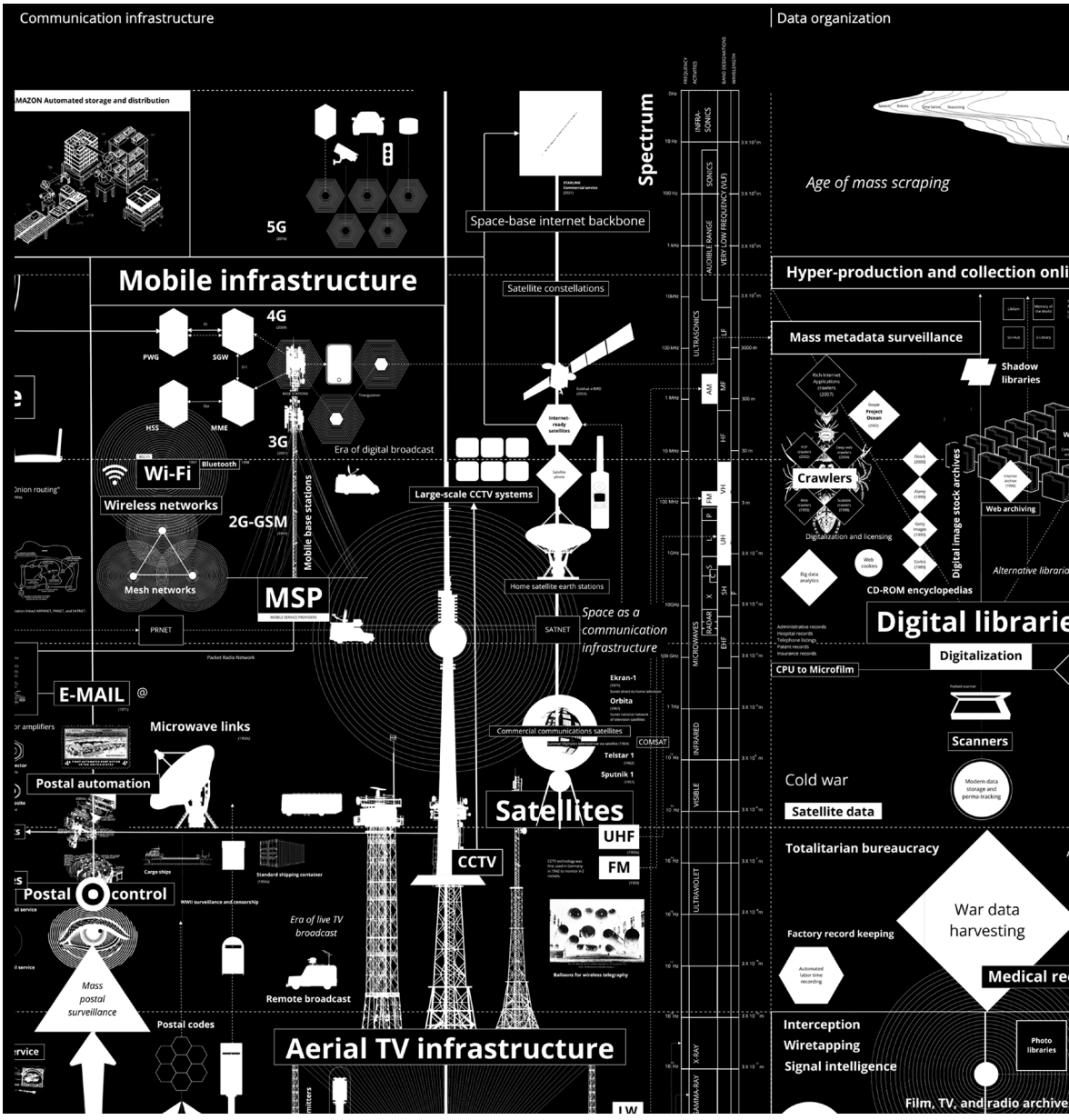
VJ: It is a tool for navigation. Once you have a map of the past, it might give you a chance to think differently about the future, or maybe to play with the past—to understand what you can take from it and what you might choose to leave behind.

I also think the idea of *Calculating Empires* was deeply tied to time. We tend to have a shallow understanding of reality. For example, when we talk about the history of AI, we often focus only on the last fifty years. With this project, we wanted to ask: why not go deeper? Why not look back 500 years? Because the roots of ideas embedded in contemporary technology go far deeper than the last few decades, and certainly far deeper than figures like Bill Gates or Steve Jobs.

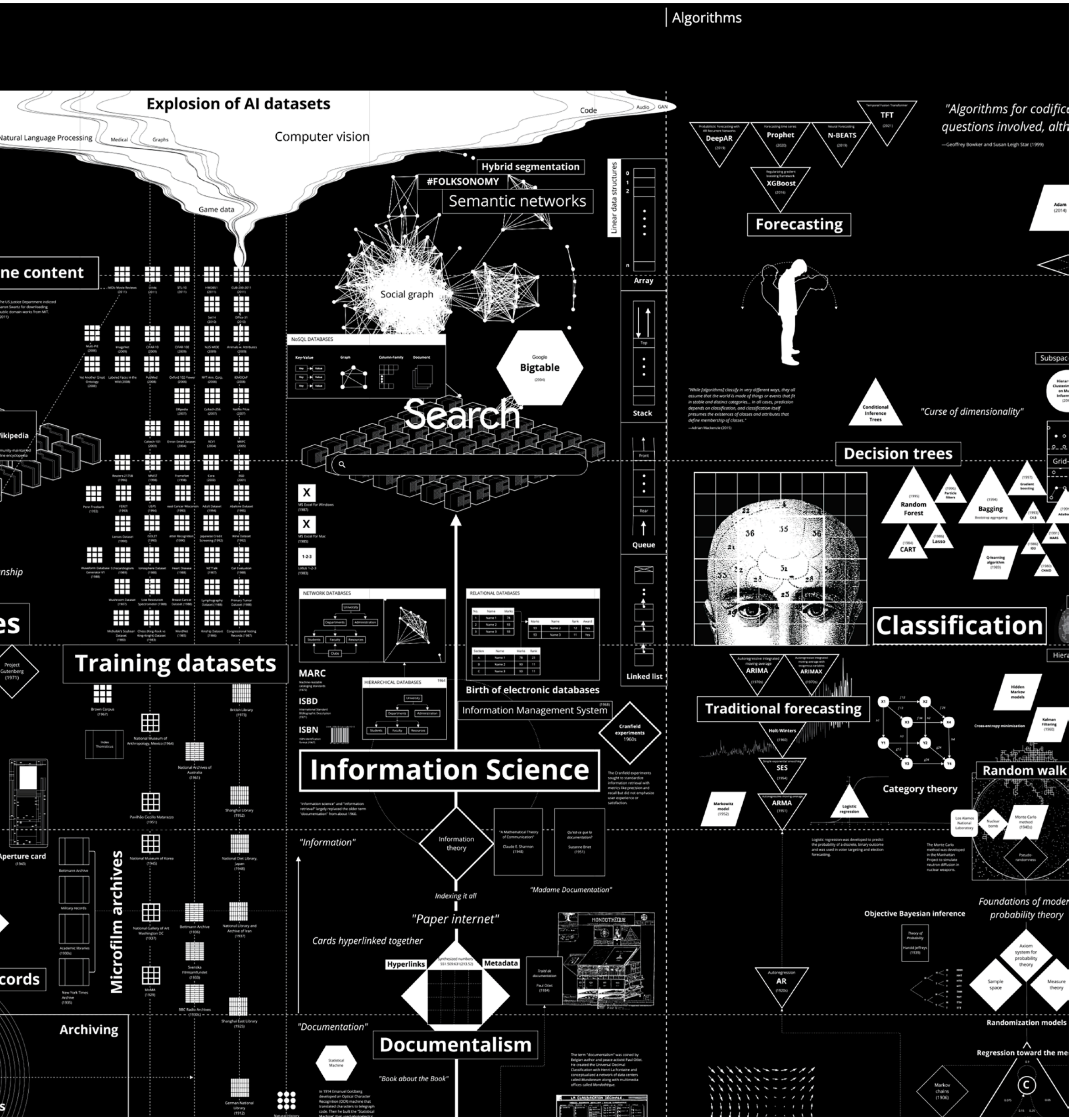
ÁG: I have always been fascinated by those small comparative illustrations—not maps per se, but the diagrams where, for example, a dinosaur is shown alongside a human figure for scale. In relation to your work, I find it interesting to consider it from the perspective of a human lifespan. In doing so, the work becomes both ungraspable and, paradoxically, more comprehensible at the same time. There is a temporal dimension here—a consideration of scale and duration—that seems essential to how your maps function and are experienced.

VJ: Another reflection on time is that we need time to really do things. We're often trapped in a fast-paced reality, constantly pressured to produce, where trends change rapidly. One year you're an expert in one thing, the next year in something else. With *Calculating Empires*, we decided to engage with a subject over a much longer period and create something that itself demands time to digest.

This is why the map is radical: it takes time to make it, to immerse yourself in it, and to read it. In a sense, it is a kind of radical time device.



Kate Crawford and Vladan Joler,
Calculating Empires, 2023.
https://calculatingempires.net/


Algorithms
Explosion of AI datasets
Computer vision
Natural Language Processing
Code
Game data
Hybrid segmentation
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Social graph
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About the Authors

Dávid Csűrös is a cognitive scientist trained at the Budapest University of Technology and Economics, where he specialised in cognitive neuroscience. After graduating, David worked at the Hungarian Academy of Sciences and in the Department of Cognitive Science at Central European University, where he was a lab manager coordinating experimental research programs. He later joined the Future Potentials Observatory, examining how artificial intelligence reshapes design practice, particularly in relation to distributed creativity and human-machine co-creation. He is currently a doctoral candidate at the Moholy-Nagy University of Art and Design (MOME), investigating how technological environments shape human experience and agency. His work spans 4E cognition, design theory, and the philosophy of technology, with a focus on how digital interfaces influence perception, action, and everyday behaviour.

Ákos Schneider is a design scholar and assistant professor at MOME. His research focuses on design culture, philosophy of design, interaction design, and critical design practices. At MOME, he leads the Theoretical Studies BA module and founded the Research Unit of New Materialities (RUM). He earned his PhD in 2022 and in the same year published his first book, *The Limits of Human-Centred Design: Speculative Design and the Posthuman Condition* (in Hungarian). Between 2023 and 2025, he worked as research lead and later as senior researcher at the Future Potentials Observatory. In 2025, he received the Aurum Futuri Research Excellence Award. He is a member of the Hungarian Somaesthetics Forum. For ten years, he served as editor-in-chief and journalist of *Designisso* magazine.

Sándor Őze is a PhD fellow at MOME, where he specialises in design history and the history of technology. He completed his master's degree in design theory at MOME in 2024. His doctoral research examines the intersections between cybernetics and modern design, with a particular emphasis on the Hungarian context. He served as an editor at *Építészfórum* between 2024 and 2025, contributing to discussions on contemporary architecture, design culture, and urban development. From 2019 to 2022, he participated in housing activism with the organisation The City is for All (A Város Mindenkié), engaging with issues of social justice and urban inequality. He is currently a board member of the Studio of Young Artists' Association (FKSE).

Márton Horn is the director of the House of Music Hungary in Budapest, an institution dedicated to music of all genres. He has a background in sociology and is currently a PhD candidate in art theory at the Moholy-Nagy University of Art and Design. Earlier in his career, he served as Head of Communications at Trafó House of Contemporary Arts and as director of Akvárium, one of Budapest's leading music venues. Over the past twenty years, he has worked as a cultural expert across multiple fields, contributing to cultural development projects, curatorial work, and program management. He has also curated music-related exhibitions and concerts, and has worked on documentary films for many years.

Dennis Meadows is Professor Emeritus and Director at the University of New Hampshire where he was Director of the Institute for Policy and Social Science Research. He has received numerous awards and is the recipient of four honorary doctorates for his contributions to environmental education. With William Behrens III, Donella Meadows, and Jørgen Randers, he co-authored the pioneering 1972 book *The Limits to Growth*, which analyses the long-term consequences of unconstrained resource consumption driven by population and economic growth on a finite planet. In 2009, he was awarded the Japan Prize for his contribution to "the transformation towards a sustainable society in harmony with nature." He co-founded The Balaton Group in 1982, an international network of researchers and practitioners in fields related to systems and sustainability, published several educational games and books, and co-authored updates to *The Limits to Growth*.

Ármin Tillmann is a PhD student in the Aesthetics programme at the Doctoral School of Philosophy at ELTE. His research centers on two main areas: Giorgio Agamben's concept of life-form, with special attention to its aesthetic and political implications, and the cultural criticism of Ivan Illich. Alongside his academic work, he regularly publishes essays and art reviews. Tillmann is a co-editor of *Café Bábel*, *Laokoón*, and *újszem*, where he also contributes translations and critical writing. He frequently translates theoretical texts from English and German into Hungarian. His most notable translations include Mark Fisher's *Capitalist Realism* (co-translated with Barnabás Zemlényi-Kovács), the anthology *Political Utopias*, and a forthcoming thematic issue on Ivan Illich.

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Robin Schuldenfrei is the Tangen Professor in 20th Century Modernism at The Courtauld Institute of Art, London. Schuldenfrei received her PhD in History and Theory of Architecture at Harvard University, and held tenure-track positions at Humboldt University, Berlin, and University of Illinois. She focuses on the subjectivity, materiality, political agency, and social impact of objects and spaces. She is head of The Courtauld's Migrations Research Cluster and organisational member of the Migration and Architecture interest group of the EAHN. She is also active in supporting Ukrainian architects, historians and preservationists. Her books include the monographs *Objects in Exile: Modern Art and Design across Borders, 1930–1960* (2024) and *Luxury and Modernism: Architecture and the Object in Germany 1900–1933* (2018), and edited volumes: *Iteration: Episodes in the Mediation of Art and Architecture* (2020), *Atomic Dwelling: Anxiety, Domesticity, and Postwar Architecture* (2012), and, with Jeffrey Saletnik, *Bauhaus Construct: Fashioning Identity, Discourse, and Modernism* (2009).

Ben Highmore is a writer, researcher and teacher. As a cultural historian his books on post-war taste and everyday life studies include *Lifestyle Revolution: How Taste Changed Class in Late Twentieth Century Britain* (2023), *The Art of Brutalism: Rescuing Hope from Catastrophe in 1950s Britain* (2017), *The Great Indoors: At Home in the Modern British House* (2014), *Everyday Life and Cultural Theory* (2002), *Michel de Certeau: Analysing Culture* (2006), *Ordinary Lives: Studies in the Everyday* (2010), *and Cultural Feelings: Mood, Mediation, and Cultural Politics* (2017). His most recent book, *Playgrounds: The Experimental Years* (2024), deals with the cultural history of playgrounds. He regularly works as a consultant for cultural institutions such as the Barbican and the V&A. Between 1993 and 2006 he taught in Bristol at the University of the West of England and in 2007 he joined the University of Sussex where he is Emeritus Professor. He was elected a Fellow of the British Academy in 2021.

Ábris Gryllus Is an interdisciplinary artist and composer based in Budapest. He is head of the MA programme in graphic design at MOME, where he graduated in 2012, and where he has been teaching since 2015. In his installations and music, he moves between familiar and unfamiliar sounds and compositional approaches, as well as the boundaries between sound, space, and human presence. He is a member of the noise-techno band FOR. His sound installations have been featured at the Berlin Gallery Weekend, the Vienna Design Week, the Soundscapes Festival, the Venice Biennale, the OFF Biennale Budapest, the Berlin Collegium Hungaricum, the Trafó House of Contemporary Arts, and the Art Quarter Budapest exhibition space. He is a recipient of the Special Award of the Lábán Rudolf Prize.

Vladan Joler is a researcher and artist whose work is a combination of data research, countermapping, investigative journalism, writing, data visualisation, critical design and other disciplines. He was a professor of the Novi Sad Academy of Arts where he had taught for twenty-five years until his resignation in 2025 in protest against the repression following the student protests in Serbia. Joler explores and visualises various technical and social aspects of algorithmic transparency, the exploitation of digital work, invisible infrastructures and related phenomena at the intersection between technology and society. His work is included in the collections of the Museum of Modern Art (MoMA) in New York, the Victoria and Albert Museum and the Design Museum in London, and the permanent exhibition of the Ars Electronica Center in Linz. In 2025, Joler and Kate Crawford's *Calculating Empires: A Genealogy of Technology and Power Since 1500* was awarded the Silver Lion at the Venice Biennale of Architecture.