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Gui Bonsiepe: Framing Design as Interface

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Gui Bonsiepe has had a remarkable career — distinguished by its length (60 years and counting) and by its variety — a career that's difficult to classify, because it has many dimensions and requires many 'keywords' to describe in a way that approaches completeness. And yet, Bonsiepe's career may serve as a signal of where design is heading or even as a model for a new generation of designers — a model of how designers may explore the 'space' of design and also expand that space as they adapt to a continuously changing world.

Bonsiepe described his alma mater, the Hochschule für Gestaltung (HfG) Ulm (1959), as "a school in Germany but not a German school." As art historian Pamela Lee has noted, the HfG had a "cosmopolitan" population with faculty from a range of disciplines (including cybernetics, information theory, operations research, physics, semiotics, systems theory, as well as more formal design disciplines) and students "from some 49 countries" filling 40-50% of enrollment in any given year.[1]

Similarly, one might describe Bonsiepe as born and trained in Germany but not a German designer. He is much more: Polyglot. Polymath. Polydesigner. At home (literally) in many countries, having lived and worked in Argentina, Brazil, Chile, Italy, and the United States, as well as Germany.

Bonsiepe's work bridges boundaries:

- 20th century - 21st century
- Old world - New world
- Global north - Global south
- Center - Periphery

- Visual - Verbal
- Form - Structure
- Object - Interface
- Material - Digital
- Technology - Use

- Production - Presentation
- Theory - Praxis
- Teaching - Writing - Designing

For me (of course, this is an idiosyncratic view), three aspects of Bonsiepe's career stand out:

- his association with the HfG Ulm
- his work on Project Cybersyn
- his book *Interface: An Approach to Design*

HfG Ulm

Much has been written (including by Bonsiepe in this volume) about this small design school that lived for a scant 15 years — a gray concrete modernist cloister, on the edge of a cow farm, high on a hill ("Der Kuhberg") in the countryside between Stuttgart and Munich, in southern Germany. And yet, the HfG remains unknown to most practicing designers. Some who do know it, describe the HfG as "the new Bauhaus," (though that term was perhaps more accurately appropriated by Moholy-Nagy for his school in Chicago). And in any case, when Gropius offered to bestow this 'blessing' (or brand extension) on the HfG, the faculty didn't exactly embrace the idea — and rightly so.

Yes, the Bauhaus (with its several incarnations) had ties with the HfG (most notably Max Bill and Josef Albers, though by the mid-1950s both had moved beyond their Bauhaus roots, inventing their own paths forward). Yet the HfG was something new and original: Its own reformation.

At core, the Bauhaus and the HfG shared the modernist credo that design could and should make the world better for everyone. But the Bauhaus was a school of architecture and art, which later added design as something of an afterthought — whereas the HfG articulated itself as a school for design, stated as such, right from the start. (Hochschule für Gestaltung translates in English literally as "high-school for design.") Most importantly, though, in so doing the HfG became a school for a new kind of design, modernism of the second generation, post-war, high modernism — the modernism of Helvetica, Lufthansa, Braun, and ultimately Apple under Jony Ive.

Yet, in the long run, 'the perfect radius' will not be the HfG's most important contribution. What was transformative about the HfG is that the curriculum embraced 'environmental design' (not to be confused with designing for the environment, an issue the HfG largely missed but rather, designing the entire 'built' environment), what the Dutch team of Wim Crouwel, Friso Kramer, and Benno Wissing called "Total Design," echoed by the approaches of British counterpart Pentagram and U.S. counterpart Unimark, multi-disciplinary collaboratives founded in the early 1960s to tackle complex systems design projects for large organizations, e.g., the Schiphol Airport (Amsterdam) signage system — design firms as a collegial faculty rather than a hierarchy dominated by a 'pater familias' starchitect.

Their concern for systems — what West Churchman called "the systems approach" — was in the air (or in the Zeitgeist for the Germans). The allies had defeated the existential threat of fascism, in large measure through better technology (i.e., the radar, the bomb, and the computer) and better planning (i.e., operations research, a forerunner of 'systems thinking'). The Bauhaus' industrial-machine optimism was replaced by a more advanced techno-optimism. Planning methods, which had won the war, would surely improve the peace. And increasingly, computers would aid management.

In a sense, improving the peace was the whole point of the HfG (the 'raison d´être' for its original funding by the U.S. Marshall Plan). To that end, the HfG embraced information theory, operations research, cybernetics, and the ethos of the systems approach. (For example, Norbert Wiener, who named the field of cybernetics, lectured at the HfG in 1955.)[2] And out of that embrace grew the design methods movement. (Two of the key founders of the design methods movement, Horst Rittel and Bruce Archer, taught at the HfG.) Design methods comes down to us today, rebranded most recently as 'design thinking'. This environment, in which designers read and discussed ideas and tried to work out what they meant for practice, was formative for design and for Bonsiepe.

Cybersyn

Around the world, 1968 was a horrible year. In Vietnam, the Tet offensive and My Lai massacre. In Prague, the Soviet invasion. In many countries, student protests. In Paris and other parts of France, occupation of schools and factories, battles with police, and strikes. In Tlatelolco, the Mexican army massacre of as many as 400 students. In Brazil and South Carolina, protesting students were killed by the police. In Germany, the head of the Socialist Students Union was seriously wounded. In the U.S., Martin Luther King and Robert Kennedy were assassinated.

Amid this broad turmoil the closing of the HfG is a footnote. Yet, the events are not unrelated. Politics played a role in ulm, too. The school ran out of money. The Marshall Plan funds were gone, and local government support evaporated amid claims that the HfG faculty were communists. Bonsiepe reported "only one nominal communist," though he didn't say whom.[3] He added, an element of the defunding may also have been that local burghers were tired of HfG students corrupting their daughters.[4]

Three years after the HfG closed, Bonsiepe was in Chile working for the democratically elected socialist government of Salvador Allende. As the account by Eden Medina in Chapter 4.10 details, Allende had made Fernando Flores finance minister. Flores (then just 28 years old) engaged British cybernetician Stafford Beer in an audacious plan to build a networked computer system for managing Chile's economy. (Keep in mind this was 1971. The IBM PC was 10 years away. The public internet was more than 20 years away; at the time, the internet's precursor, ARPANET, had only 13 research nodes.) Flores' plan was called Project Cybersyn — cybernetics + synergy. More colloquially, it was known as El Sistema Synco (Sistema de INformación y COntrol), "system of information and control".[5]

Earlier, Flores had worked on an operations research team of the Chilean State Railways.[6] From that project, he knew of Beer's work and of his book *Decision and Control,*[7] which describes how frameworks from cybernetics might be applied to business management — the sort of work Beer had done for United Steel and International Publishing Corporation in the U.K., forming the consulting firm SIGMA (Science in General Management). Flores was impressed by *Decision and Control,* and on a visit, saw the book in Bonsiepe's library. Later, Flores told Bonsiepe that he imagined Bonsiepe was the only other person in Chile to have the book and that sealed Flores' decision to hire Bonsiepe to work on the Cybersyn project. That Bonsiepe had the book is an effect of the ethos of the HfG and its interest in systems theory.

The Cybersyn operations room (the network's central node, which was to be housed in the Chilean presidential palace, Palacio de La Moneda, in Santiago, before the 1973 coup intervened) may be among the most well-known artifacts Bonsiepe designed with others (he has been very careful to note that the project was a team effort). The room and its command chairs look a bit like Eero Saarinen's Tulip Chair (Knoll, 1955) meets the StarTrek Bridge (Matt Jefferies, 1966) in Winston Churchill's cabinet war rooms bunker (1939).

In addition to the room and furnishings, Bonsiepe also managed both the interface and information design for Cybersyn. And information was the whole point. The system was designed to tell the government what was happening in factories and also how citizens were feeling. Some 500 remote telex machines were to feed information to 2 mainframes in Santiago. A parallel effort, Project Cyberfolk, was to follow soon after. The Project was designed to use "algedonic" meters to get information on the pain ('algos') or pleasure ('hedone') created by government policies through polling devices. "Beer built a device that would enable the country's citizens, from their living rooms, to move a pointer on a voltmeter-like dial that indicated moods ranging from extreme unhappiness to complete bliss. The plan was to connect these devices to a network—it would ride on the existing TV networks—so that the total national happiness at any moment in time could be determined."[8]

Why all this effort?

The primary complaint about centralized economic systems is that they allocate resources poorly, in large part because they lack the required information. (We put up with the inequities of market economies because they are supposed to allocate resources more efficiently.) Yet, living beings (like you or me) are centralized (at least to a degree) and fairly competent at allocating our internal resources. Beer had reasoned that organizations, too, can allocate resources efficiently — thus his "viable systems model". Unfortunately for Beer, Allende, and Chile, the technology available to them in 1971 was not up to the task. (For example, the Cybersyn information displays required a great deal of labor to keep up pace, as they had to be changed by hand.)

Fast-forward fifty years though, and today's technology is more than ready. Technology critic Evgeny Morozov, quoted above, has suggested that "Big Data and distributed sensors" — coupled with the internet, cloud computing, machine learning, and mobile devices — "… insure [sic] that the market reaches a homeostatic equilibrium by monitoring supply and demand."[9] Morozov used Uber as his prime example, but the leading U.S. tech companies — Amazon, Apple, Facebook, Google, Microsoft, etc. (and their Chinese counterparts) — are all involved in "Cybersyn capitalism". Social psychologist Shoshana Zuboff later called it "surveillance capitalism". Recently, art historian Pamela Lee updated the label to "algorithmic capitalism".

Measurement (or continuous surveillance, if you like) is just a part of the whole operation, which includes monitoring (comparison of current to desired state), acting to correct any errors (control), and optimizing models (learning from reaction to those actions and adjusting goals), creating not only a self-correcting feedback loop but also a self-improving system — the sort of 'data refinery' powering leading tech companies today — and coming soon to most organizations. Already, portions of some of the tech companies are at least partially self-driving (operating semi-autonomously, like the vehicles several of them are building), and Amazon, Google, and Microsoft have begun offering the necessary software-as-a-service (SaaS) for any organization to have its own data refinery. (For even scarier examples, see Palantir Technologies — "algorithmic policing" in the surveillance state — and the Chinese social credit system.)

Yet Cybersyn and Cyberfolk were not designed for private interests/the market, they were designed for a Socialist government/purposes and therefore point to alternative futures – "algorithmic socialism" – the sort of information-driven management that may be required to ensure justice, avoid climate disaster, and keep healthcare from bankrupting us. The socialist dimension of information-driven management shouldn't be a surprise.

After all, the Internet has become critical infrastructure (as indispensable as other public utilities), and "information is a national resource" as Beer noted way back in 1975.[10]

The ulmers saw the information revolution early — information was one of five tracks at the HfG.[11] And Bonsiepe, in particular, got on board and helped lead the way.

"Interface: An Approach to Design"

In 1960, Bonsiepe worked with Tomás Maldonado (who was then rector of the HfG) to design an alphabet and "sign system for the display and control panels on an Olivetti ELEA 9003 mainframe computer." (The computer's industrial design was done by Ettore Sottsass, well before his Memphis period.) About the Olivetti project, Bonsiepe wrote, "Without having a name for it, we were working on the subject that is now called interface design."[12] (For perspective, consider that Xerox PARC, a source for many of the features of today's standard computer interfaces, was founded in 1970, and ACM's SIGCHI, the main professional organization concerned with Computer-Human Interaction, was formed in 1982.)

To date, Bonsiepe has worked on 35 interface design projects. He has also taught interface design at KISD (Köln International School of Design, 1993-2003), at the Jan van Eyck Academie in Maastricht (1997-1999), and at ESDI (Escola Superior de Desenho Industrial, Rio de Janeiro, 2003-2005).[13] Among those projects, Cybersyn stands out, but its story did not end with Allende's murder in the CIA backed coup of 1973. The junta imprisoned Flores for three years. In 1976, with the aid of Amnesty International Flores obtained release to the United States, where he worked as a researcher in the Computer Science Department at Stanford. There, by way of Chilean biologist and cybernetician Francisco Varela, Flores met Terry Winograd, who was a professor of computer science.[14] Flores and Winograd collaborated on several projects, including a software application called the "Coordinator". Flores founded a company (in Berkeley) to release the application — Logonet (later Action Technologies). And in 1987, he invited Bonsiepe to Berkeley to work on interface design and documentation design for a subsequent application (the MHS Message Handling System and the Mail program). For this work, Bonsiepe used a Macintosh SE, MacPaint software, and the then new Hypercard application — the first generation of tools for interface designers before the web.[15]

In 1992, Bonsiepe presented a paper, "Design: from the material to digital and back," for the Cultura y Nuevos Conocimientos symposium, at the Universidad Autónoma Metropolitana, Azcapotszalco, Mexico. This paper became a cornerstone of Bonsiepe's book of selected essays *Interface: An Approach to Design.* The book was completed in 1994, published in Italian in 1995, German in 1996, and English in 1999. During this period, most writing about interface design (also CHI, HCI, UI, UX, web design, interaction design, or even experience design) was of three types:

- picture compilations, show-and-tell, with sample icons and screens
- guides on how-to-code, in Metafont/TEX, Postscript, HyperTalk, Lingo, ActionScript, DBN (later Processing), HTML/CSS/JS, Java, etc.
- rules-of-thumb or 'heuristics', perhaps from small-sample 'experiments' or case studies, sometimes dressed up as 'principles'

These types of publications met the immediate needs of designers to see what was new in technology/new technologies and then how to dive in and make things on their own. A few authors were able to 'pull up' and offer ideas of a broader, more lasting sort, an emerging set of principles for approaching designing for the digital realm. Rarer still were authors who offered ideas about what it all might mean — how the new technology might change the way we think about design. (Remember, in the early 1990s traditional designers, like Paul Rand, still claimed, "The computer is just another tool, like the pencil.")[16] The ideas understanding the computer as more than a tool (i.e., a new medium, with its own vocabulary, grammar, and rhetoric) and that its many roles were already reshaping design were not widely understood — and were difficult to see before the public internet burst forth in the late 1990s.

Bonsiepe saw the implications early, and he was one of the very few who offered something like a theory of design. Richard Buchanan was another. But where Buchanan simply identified "interaction" as a new frame, Bonsiepe dove in and explored.

Perhaps most profound, though, were Terry Winograd and Fernando Flores, in their seminal book, *Understanding Computers and Cognition: A New Foundation for Design* (1986). Winograd and Flores connected design (in the context of computer science and artificial intelligence) to linguistics and philosophy. Heidegger and Maturana figure prominently; not exactly accessible-fare for the average designer or even for most design teachers. (There is some irony in Flores writing a book on design — and a difficult one — in that Flores told Bonsiepe most designers are what he terms "confusionistas", makers of confusion.)[17]

Bonsiepe again provided a bridge. He noted, "The interface is the central domain on which the designer focuses attention. The design of the interface determines the scope for action by the user of products. The interface reveals the character of objects as tools and the information contained in data. It makes objects into products, it makes data into comprehensible information... The interface creates the tool. ... Without interface there are no tools".[18]

The boldness of these claims and Bonsiepe's purpose in making them may not be evident immediately; further explanation and reflection may be needed.

What Bonsiepe meant by "interface"

In the domain of computing, an 'interface' is a communications link — a physical connection (a plug or cable) or a protocol (a set of rules) for requesting data (or both) — a bridge between two systems, sometimes between two devices but often between a human and a machine or more specifically between a human and a software application running on a computing device.

Beginning with the traditional two elements (the person and the tool), Bonsiepe added a third key element — an action or "a task which the user wishes to perform." He defined the 'interface' as linking all three: person, tool, and action. He also emphasized "that the interface is not a material object, it is the dimension for interaction between the body, tool and purposeful action."[19] The designer's role is, in large part, "structuring the action space (topological structure)" for the user.[20] Later, Bonsiepe added, "An interface can illuminate connections or leave them murky and opaque. It can open up possibilities for effective action or obstruct them".

Bonsiepe began with the narrow case of the human-computer interface (software as a tool). Then he applied his model (person-tool-action-interface, what he called "the ontological diagram of design") to the broader case of material objects (to physical tools), for example, a pair of scissors, a thumbtack, "a bread knife, a lipstick, a Walkman, a beer glass, a high precision drill". And finally, he also applied his model to "semiotic artifacts" or "sign-based" objects (communications tools) — to information. A traditional physical book or a digital multi-media piece (hypertext) is also a tool, which coupled with a user (reader / player), supports the action of learning, which itself supports other actions. He noted, "Typographic design is the interface to the text".

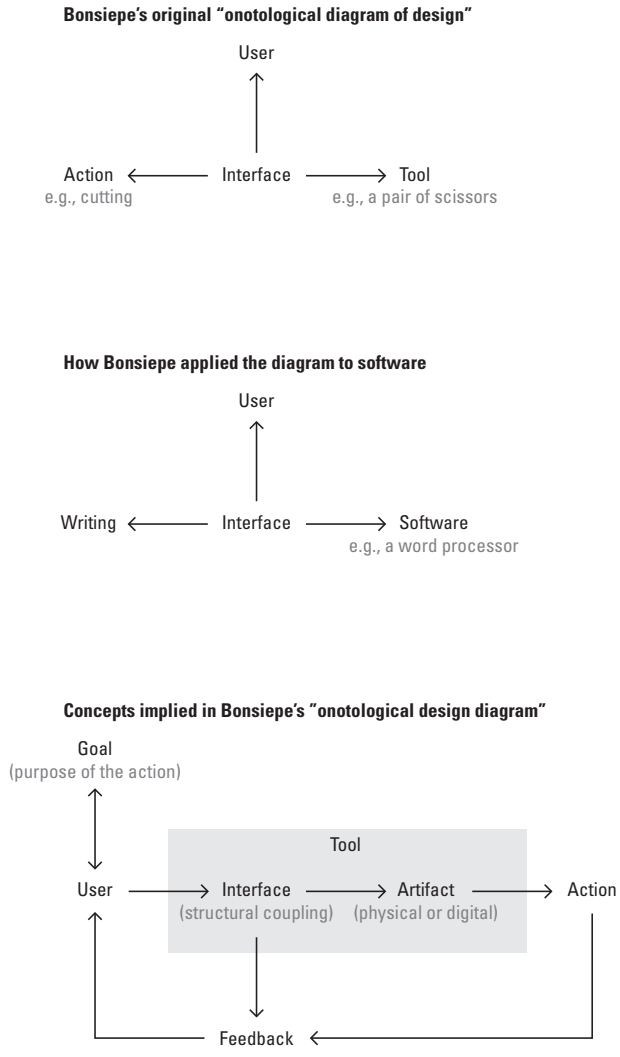
Bonsiepe framed all of design as interface design, not just software design but also (and explicitly) product design, graphic design, and information design. Drawing on Heidegger, he concluded, "Design is the domain of transforming present-at-hand into ready-to-hand. The notion of ready-to-hand is constitutive of design — and in this central aspect it differs from both art and science, constituting a domain of its own right. ... I call this domain 'interface'".

Drawing on Maturana, Bonsiepe noted that his ontological diagram of design suggests a "structural coupling" between the person and the tool. He also noted that the person needs the tool to complete a task, the action in his diagram. Of course, the action serves a purpose, the person's goal, an end for which the task is a means. Operation of the tool (its use) provides at each moment feedback to the user about the current state, which the user may compare to the desired state (to the goal), and so correct any errors.

An aim of the designer (and the user) may then be that the tool 'disappears' or at least becomes 'transparent' "so that he no longer has to think about it and it recedes into the background" so that the user can focus on the task.

In this way, the ontological diagram of design echoes cybernetics and also connects Maturana and Heidegger.

Figure 1
Bonsiepe's "Ontological Diagram of Design" and its relation to software and interface.



Why Bonsiepe's "interface" frame matters

Bonsiepe saw "interface" as a new "approach to design" — the subtitle of his book. And in a 2003 interview, he said, "I developed a reinterpretation of design as the domain of the interface where the interaction between users and tools is structured. I consider this not a minor contribution to design theory."

In truth, it is a major contribution.

Here's why. In explicating his "approach" — his framing of design as "interface", Bonsiepe made several related "moves":

- Claimed design as a 'fourth way', separate from art, science, and technology.
- Distinguished designing from engineering.
- Provided an alternative to frames which cast design as primarily about cosmetics, aesthetics, drawing, or form.
- Defined the need for theory in design practice.
- Connected design theory and design practice.
- Embraced the idea that language is a fundamental element of design practice.
- Linked the verbal and the visual in design.
- Provided a theoretical basis for a new design discourse.
- And perhaps even reformed the modernist ideal.

Recently, I asked Bonsiepe, "How is that you remain optimistic about the possibility of the modernist ideal (or perhaps 'the ideal of the project of modernity') that design might (or must) make the world better?"

And he replied, "I don't know whether I am an optimist; perhaps better to use the term 'constructive pessimist'. I am aware that we are living in a period of counter-enlightenment known under the term 'post-modernism'. But this approach is not convincing. Without the term 'Utopia' you don't get anywhere (as far as design is concerned)."[21]

In this other horrible year, 2020, one of the things Bonsiepe's essays bring us is a renewed sense that there might still be room in design practice for the modernist ideal that we can and must make the world better. For one thing, we might yet give algorithmic socialism a future.

Interface is out-of-print. However, this new volume brings forward many of the original book's essays together with a comprehensive selection of Bonsiepe's other writing. I'm delighted to see this new volume. And I commend Bonsiepe's essays (and his career) to design students of all types. Both deserve our study.

Endnotes

1
Pamela Lee, *Think Tank Aesthetics: Midcentury Modernism, the Cold War, and the Neoliberal Present,* (Cambridge: The MIT Press, 2020), 193.

2
A more surprising visitor, at least at first sight, was Martin Heidegger. See Spitz, René, "The Ulm School of Design: A View Beyond the Foreground," (Stuttgart: Edition Axel Menges, 2002), 235.

3
Ibid. p. 111

4
Personal communications between the author and Gui Bonsiepe, 2007.

5
Lee, ibid., p. 133

6
Lee, ibid., p. 157

7
(Chichester: Wiley, 1966). The book is still in print.

8
Morozov, Evgeny, "The Planning Machine: Project Cybersyn and the Origins of Big Data Nation," *New Yorker,* October 13, 2014. For more extensive description of the project see, in this volume, chapter's 4.10 (a), Bonsiepe's own description of the Opsroom, and 4.10 (b) an extract from Eden Medina's *Cybernetic Revolutionaries: Technology and Politics in Allende's Chile,* The MIT Press, Cambridge, 2011.

9
Ibid.

10
Ibid.

11
Under the 1951 revised curriculum model, the hfg organized around five areas: architecture, city planning, information, product form, and visual design.

12
Gui Bonsiepe, "The Exotic and Interests" in *Interface: An Approach to Design* (Maastricht: Jan van Eyck Academy, 1999), 12.

13
Personal email between the author and Gui Bonsiepe, November 2020

14
Personal email between the author and Terry Winograd, November 2020.

15
Personal email between the author and Gui Bonsiepe, October 2020.

16
Personal communications between the author and Paul Rand, 1992.

17
Bonsiepe, personal email to the author.

18
As with the other introductory essays in this volume that quote or make references to papers in the book, the pagination will be by the chapter number and page reference.

19
Ibid., 29.

20
Bonsiepe, "The interface design of computer programs" in *Interface: An Approach to Design* (Maastricht: Jan van Eyck Academy, 1999), 47.

21
Personal email.