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Manuscript

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Discourse

Discourse is institutionalized text, talk, and constructive actions. It is consensually maintained and advanced by communities that identify themselves in terms of its premises, practices, and resulting artifacts.

For example, medical discourse creates remedies for bodily illnesses and injuries. It determines how one can become a member of the medical community and utilizes an amazing array of constantly evolving methods and technologies for diagnoses and treatments.

Legal discourse certifies its judges and lawyers and is practiced in specialized settings, the courts, following established procedures and applying the rules of law to those accused, declaring them guilty of a crime or innocent.

Engineering discourse deals with the physical functioning of mechanism. Practitioners have to earn degrees before they are trusted to justify the constructions of larger structures, whether they are engines, airplanes, bridges or rockets.

People may play different roles when crossing discursive boundaries – e.g., speaking as a designer in one setting and as a patient in a doctor's office in another. Most discourses are essentially incommensurate relative to each other. Lawyers do not have the qualifications of medical doctors and politicians are clueless about programming computers. Design discourse, however, has to be more inclusive.

A brief history of design discourse

Although, designing is fundamental to being human – ranging from making primitive tools to arranging the furniture of one's living room. The concept of a designer emerged during the industrial revolution. Manufacturers saw the opportunity of expanding their markets by hiring artists to make their products more sellable. Aesthetics became redefined as what attracts potential users, and design discourse focused on beautifying mass products.

However, not all artists were willing to serve industrial needs. William Morris, a major advocate for the Arts and Crafts Movement in 19th century England, had an opposing vision of what designers should contribute to society. He argued against meaningless ornamentations and cheap mass products in favor of artifacts that reveal the materials and craftmanship that went into their making. This movement had a major impact on the way the quality of artifacts was talked of and conceptualized internationally but did not affect how designers in industry defined themselves.

The Bauhaus too cultivated a larger vision of society. It took mass production for granted and promoted simple geometric forms that were thought to be of universal value and would make products available to ideally everyone.

Max Bill, the intellectual founder of the Hochschule für Gestaltung in Ulm, saw its mission in aiding the reconstruction of material culture in Germany to start, devastated by the Nazi regime and World War II. He argued for four functions that all designs would have to satisfy. The technical, material, and production functions were primary. Only when these three requirements were met, was the aesthetic function to be considered.[1] Users were not mentioned but implied in the technical function. Ulm was quite explicitly opposed to Raymond Lowey's styling and selling out to the interest of marketing.

My career started in Ulm. I had been an engineer, wanted to escape its computable functionalism, and soon recognized that functions are always assigned to constrain designers' focus on what an authority – a client or teacher – deemed essential. Inspired by exposure to social perception, and cultural anthropology, my diploma thesis[2] reconceptualized artifacts within social processes of communication among verbally competent people. I recognized that users can interpret their artifacts variously. The meanings they attribute to them explained their users' interactions which are only marginally predictable by their designers. This was long ago.

While at Ulm, we all understood that good explanations and justifications were the key to rendering designs acceptable. But how our own discourse did this was not part of our deliberations.

When is design?

In my view, professional designers always **create innovations that make a difference in the lives of other communities**. Innovations may be small or groundbreaking. However, copying what worked previously does not make a difference, ought not to count as design, nor is following predicted trends.

Design is inherently **unpredictable**. Designers always cross the very boundaries that everyone else takes for granted. Computers may aid design, even surprise their users, but they always operate within programmed boundaries and cannot serve as surrogate for designers.

Also, design should not be confused with problem solving.[3] Usually, problems are defined in the discourse of institutions interested in benefitting from particular solutions. Much of design starts with **problem finding**.

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[1] Max Bill (1952). *Form: eine Bilanz über die Formentwicklung um die Mitte des XX, Jahrhunderts*. Basel: Verlag K. Werner.

[2] Klaus Krippendorff (1961). Produktgestalter kontra Konstrukteur. *Output 5+6*: 18-21. http://repository.upenn.edu/asc_papers/299

Klaus Krippendorff (1961). *Über den Zeichen- und Symbolcharakter von Gegenständen: Versuch zu einer Zeichentheorie für die Programmierung von Produktformen in sozialen Kommunikationsstrukturen*. Diplom Thesis. Hochschule für Gestaltung, Ulm. http://repository.upenn.edu/asc_papers/233

[3] For an advocate of this view see Herbert A. Simon (1969/2001). *The sciences of the artificial, 3rd ed.* Cambridge, MA: MIT Press.

To the extent design **theories** extrapolate from design histories, they **cannot predict innovations**. It is well known that futuristic theories of technological developments have largely been failures, mainly because the community of designers does not follow prescribed paths.[4] We know of many examples of theories that stated decisively why something is impossible and yet designers found a way. For instance, at a time when horses pulled carriages on tracks, it was predicted that engines with steel wheels on steel tracks could not possibly have enough traction to pull a train. Well, we do have locomotives, even bullet trains.

Although creativity is often attributed to celebrated designers, evidence suggest that most **innovations emerge in conversations**.[5] Indeed, designers almost always work in teams and are building on the accomplishments of previous designers. Automobiles, for example, have a long evolutionary history. Generations of unknown designers introduced innumerably many small innovations which over time got us to cars that are fast, comfortable, and increasingly safe to drive, perhaps not yet as efficient as we hope. It is largely illusionary to identify single designers for the technologies we live with. But we can trace the roots of innovations to the discursive practices of their times.

While professional design focuses on social worlds larger than what individuals may construct for themselves, today, we can no longer discount the fact that **ordinary people discuss and design their own worlds** with what is available to them.

Finally, design discourse has largely ignored its own practice in language. One should acknowledge that **all designs start as proposals for something unprecedented**. proposals, plans, assurances of benefits, whether accompanied by drawings or models, are always justified in language.

A trajectory of artificiality

There is no doubt that design has expanded its discourse to include increasingly complex artifacts. I described this expansion as a trajectory of artificiality of changing concerns,[6] starting with:

Products, which are what a factory produces. The original design discourse was limited to serve manufacturers' needs to expand their markets. The concern for:

Appearances began as an add-on of product design but quickly became a more general concern for how the meanings of artifacts emerge in communication among users and bystanders. It further expanded the range of designers' competencies to address what people talk of, admire or despise, their loyalties to brands, the emergence of fashions and celebrities, public opinion and the discursive differentiation of user communities.

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[4] Klaus Krippendorff (2016). Design, an undisciplinable profession, pp. 124, 197-206 in G. Joost, K. Bredies, M. Christensen, F. Conradi & A. Unteidig, eds. *Design as research. positions, arguments, perspectives*. Basel: Birhäuser Verlag / De Gruyter.

[5] Steve Sloman & Philip Fernbach (2017). *The knowledge illusion; Why we never think alone*. New York: Riverhead Books.

[6] Klaus Krippendorff (2006). Section 1.2 in *The semantic turn; A new foundation for design*. Boca Raton, FL: Taylor&Francis, CRC Press. Translated (2013). *Die semantische Wende*. *Eine neue Grundlage für Design.* Schriften zur Gestaltung / Züricher Hochschule der Künste. R. Michel (ed.). Basel: Birkhäuser Verlag / De Gruyter.

Interfaces with computers became the model for designers who realized that the form and appearance of artifacts is only the first step to how users interpret their artifacts and interactively engage with them. The ability to design interfaces became indispensable as artifacts grew in complexity, exceeding their users' ability to understand what was below their surfaces. Interfaces are very much tied to the use of language. They draw on familiar linguistic tropes, narratives, and cultural habits. For example, to enable users to handle the complexities of personal computers, interface designers relied on familiar metaphors of the paper world. Shifting from forms to interfaces revolutionized the conception of what designers had to enable, even for simple devices.

Multi-user systems network very many users to their benefits. Their design must accommodate the diverse conceptions of their many users, for example, in proposing public services, restaurants, airports, health care systems, and Internet platforms. Such systems do not need to merely work, they need to grow. This is because the benefits of their individual users become amplified by growing numbers of often anonymous participants, with vastly different interests and capabilities.

Projects bring different people into communication to introduce changes in the world. Designers often face interdisciplinary working groups who define problems and develop solutions that their participant could not imagine on their own. Projects also include starting businesses, organizing public campaigns, or mass demonstrations. Being able to facilitate such communications is a frequent challenge to designers. Finally:

Design discourse is practiced when designers engage in their own work and explain their competencies to other professions and disciplines who have their own vocabularies and foci of attention. Designers designing their own discourse is a self-reflexive effort. It requires awareness of what one's own use of language does, when it limits their own perceptions and actions, and when it opens previously unimaginable possibilities. Advancing design discourse may start with critical examinations of how design discourse is taught, published, and practiced. It is sharpened when facing competing discourse communities or in collaborations with experts from other disciplines for whom it is important to know what designers bring to the table, and the responsibility they are willing to assume for what their innovations do in the social world.

What design discourse needs to facilitate

Whereas other professional discourses are relatively autonomous, if design is to make a difference in the lives of targeted communities, it must embrace their languages, discourses, resources, and inclinations to move beyond current habits. Designers' listening to others does not mean surrendering to the conceptions of those who claim to have a stake in a design, its stakeholders, including clients and users. It means being able to cooperate, actually and virtually, with potential stakeholders of a design. I have seen many development teams in which designers were forced to play minor roles because their discourse was insufficiently grounded in evidence and unable to withstand the rhetorical strength of other stakeholders, often based on statistical and theoretical arguments that constrained innovations. Following are a few practices that would strengthen the discourse of designers.

Methods of inquiry

Designers apply all kinds of research methods borrowed from other disciplines, but there are several methods that are unique to design. One is to survey opportunities. **Ethnographies of**

unimagined possibilities[7] explore burdensome practices, difficulties, dangers, fear of failures, costly mistakes, and boring tasks, knowledge of which can inspire designers to make important contributions. Asking people for their desires rarely reveals anything other than what is already known.

Given that designers cannot start from scratch, another method involves **surveying existing technologies, materials, and practices for their unexplored combinatorial possibilities**.[8] Especially new artifacts tend to arise in specialized contexts of use. Examining their unutilized affordances to be combined into larger systems has always been an important source of innovation.

Traditionally, design research was limited to testing whether proposed artifacts were producible, marketable, and of practical use. **Post-design research** extends this inquiry. It follows the paths design proposals are taking to wherever they end up. It enables designers to evaluate the ultimate reasons for why their designs succeeded and where they got stuck. Systematic post-design research expands the scope design discourse by identifying facilitators and obstacles.

While all **design research methods ought to aid design processes, they must also convince the stakeholders** of designs to get on board. To be clear, data always represent the past from which designers need to deviate. Design research results are best evaluated during **creative conversations** among designers and with relevant experts. Conversations, to the extent they are conducted with openness and mutual respect, are the most efficient evolutionary practices we know. Participants bring different discourses into interactions, elicit suggestions from each other which go beyond what is known, and either elaborate or ignore them with mutual consent.[9] Conversations are inherently unpredictable. By drawing on multiple perspectives and proceeding with mutual consent reduce the risk of innovations to fail.

Participation in stakeholder networks

Plans and design proposals, even if accompanied by drawings, models, and videos, always need to be communicated and can hardly avoid the use of language. To succeed, they must provide convincing justifications for the benefits they could provide to those capable of advancing, adopting, and living with them. Any proposal faces a network of stakeholders without which it cannot become real and make the differences that designers may envision.

By definition, stakeholders have a stake in something, here in the realization of a design. Stakeholders are far from passive recipients of instructions. They have their own discourses, expertise, and resources by which they judge any proposals, and facilitate or oppose their realization.

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[7] Ozge Celikoglu Merzali, Klaus Krippendorff & Timur Ogut Sebnem (2019). Inviting ethnographic conversations to inspire design: towards a design research method. *The Design Journal 23*, 1:133-152.

[8] George Pólya (1957). *How to Solve It*. Doubleday: New York.

Herbert Simon (1969/2001). *Op. Cit.*[3]

Genrich Altshuller, Lec Shulyak and Steven Rodman (Trans.) (1997). *40 Principles: TRIZ Keys to Technical Innovation*. Worchester, MA: Technical Innovation Center.

Charles C. Lindner & Christopher A. Rodger, eds. (1997); *Design theory*, CRC-Press.

[9] Klaus Krippendorff (in press). Communication, conversation, discourse and design. In *Matters of communication*. Sabine Foraita, Biancs Herlo & Axel Vogelsang, eds. Deutsche Gesellschaft für Designtheorie und –forschung. Transcript Verlag.

Stakeholders may be executives in board meetings deciding on how a design fits their corporation's mission; engineers having to ready it for production; marketeers evaluating its possible markets, sales people needing to attract customers; buyers weighing its costs by its benefits; users looking for efficiency, support, perhaps social recognition; suppliers providing services that maintaining its use; recyclers aiming to salvage what could be used elsewhere; and environmental activists making sure that it would not destroy the ecology for future generations. Any important stakeholder can bring a design to a halt. **Designs that fail to move through the network of its stakeholders cannot make a difference** in the world.

The equation of designs with executable specifications for realizing a product, valid during the industrial era, may still be alive within administrative structures, however, our social realities have become more fluid, complex, networked, and defiant of traditional heterarchies. Especially when moving up the trajectory of artificiality, design discourse needs to overcome resistances to proposed innovations, attract supporting stakeholders, and satisfy opponents.

Designing affordances to delegate design

Given that all stakeholders have their own discourses, their own ways of judging whether they have the means to and interest in realizing or using a design, the motivations needed to enlist them into designers' projects may not be merely monetary. The possibility of making creative contributions tends to provide the more important and intrinsic motivations for stakeholders to enroll in designers' project and facilitate moving a proposal through emerging stakeholder networks. For example, bankers are motivated by the excitement of increasing returns of their investments, engineers by the opportunity of developing a new mechanism for making an artifact work, salespeople by attracting customers, and users by improvements in their social lives.

Viable networks among them can emerge mainly when designers recognize that they cannot prevent their proposals from being reinterpreted and evolve in the process of passing through the network of their stakeholders and provide rooms for such reinterpretations. For designers' proposals to survive, designers are advised to anticipate the interpretations and actions available in all stakeholders' discourses. Designers need to provide the affordances for stakeholders to creatively contribe without distorting their design too much. Today, designers succeed by **delegating design** to successive stakeholders.

Personal computers, cellphones, and the Worldwide Web are prototypical examples of the results of delegations of design to an unknown diversity of users. These artifacts are designed as open systems that allow their users to upload a variety of applications and create their own worlds to interact with. Social media can communicate any message in any written language and on any subject. How the use of the Internet is evolving was unimaginable by those who designed its original code.

Delegating design, partly facilitated by widespread digitalization, is a serious conceptual challenge to designers in contemporary society. Some fear it eliminates the design profession. However, it will preserve designers' role as cultural innovators if the design discourse is continually updated and the scope of design practices ventures into increasingly complex areas – as sketched in the above-mentioned trajectory. Underlying this reconceptualization of design is the admission that designers can no longer claim exclusive authority over what their designed artifacts mean to others and how they enact their meanings.

In our information age, design discourse has already shifted its attention from designing the forms of functional artifacts to the **design of affordances** for interactions that enable communities of stakeholders to design their own **discursively meaningful interfaces** with their worlds.

A new epistemology of artifacts.

To be clear: artifacts do not speak a language, humans do. Proposals are texts in need of interpretations by literate readers. Texts neither know what they contain nor speak for themselves. This is true for products, appearances, multi-user systems, even projects. People talk with one another, negotiate the meanings their artifacts have for them, and use them accordingly. Designers may visually or verbally encourage stakeholders to interpret and act within the scope of their proposed artifacts' affordances, but they cannot prescribe the perceptions of and actions by their stakeholders.

Generally, **most affordances are not recognized** and never acted upon. Think of what one could do with table ware, which is used mainly for eating, washed thereafter, and stored for another occasion. It has been used as rhythmical support for music. Children are fond of playing with it. It can serve as tools to pry a can open, even as a weapon. Contexts matter, both physically by enabling or preventing intended uses and socially by judging uses that are appropriate or inappropriate in a given situation. Designing the affordances of artifacts requires exploring the diversity of contexts in which these artifacts might find themselves and the multiplicity of interpretations that diverse stakeholders' discourse communities encourage to interactively create their worlds. Naturally, the affordances that designers need to explore before proposing their designs have to by far exceed the affordances that any one individual stakeholder could imagine.

The epistemological challenge for designers consists of abandoning the naïve conceptions of a reality they alone are able to see for what it is or is creating for everyone else. Instead they have to acknowledge that the artifacts they propose merely provide affordances to their stakeholders who perceive and use them as they see fit. Moreover, that the actual use of affordances depends on the concepts, metaphors, and narratives that circulate in relevant discourse communities. Discourses are validated by the actions they encourage.[10] The history of science demonstrates that reality can afford numerous theories. Some failed by not affording the actions they entailed, others succeeded by enabling scientists to build on their affordances.[11] Metaphorically speaking, reality is a dumb communicator. It can say only "no" or silently comply with how it is talked of and treated. We experience that "no" when our computer does not comply with what we intend to accomplish. The pilots of Boeing's 737 Max experienced it when they could no longer control their airplane. Some argue that such experiences are due to their users' inadequate conceptualizations. Equally justifiable is to blame the designers of these artifacts for failing to support users' common interpretations and actions, especially when designs exceed their users' comprehension.

The latter explanation points to the fact that designing artifacts for communities other than their own requires of designers to step out of their own conceptual bubble and explore the affordances of contexts, conceptions, and related actions their stakeholders could bring to a design and prevent them from getting into trouble when routinely enacted.

The "no" experienced when interacting with one's world signals an important obligation for designers: Preventing uses of artifacts that they or their stakeholders do not wish to be afforded, whether for social reasons or because of the irreparable harm, even loss of lives, they could inflict.

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[10] Klaus Krippendorff & Nour Halabi (Eds.) (2020). Discourses in action; What language enables us to do. New York: Routledge.

[11] Ludwik Fleck (1979, German original, 1935). *Genesis and development of a scientific fact.* Chicago IL: University of Chicago Press.

All modern safety features, for instance in cars, are constraints on otherwise available affordances. Fingerprint checks as condition to pull the trigger of a gun prevents unauthorized uses and saves human lives. Designing containers for medications that children cannot open prevents them from mistaking pills for candy.

The task of deciding which of the multitudes of affordances to encourage or disable easily runs into cognitive limitations and raises ethical issues. Unanticipated consequences, exemplified above, demonstrate designers' cognitive limitation. Who would have thought that trucks designed for transporting goods could be used to indiscriminately kill masses of innocent people? Ethical issues arise when designs selectively discriminate against stakeholder communities.

Both issues need to be addressed. When designers bring the diverse discourses of their stakeholders into conversations, it is easier to generate multitudes of affordances then when working alone.[12] It is also easier to distinguish useful from harmful affordances and how to constrain the latter. Therefore a design discourse ought to transcend its earlier focus on fictional end-users and serving the needs of manufacturers in favor of pursuing larger socio-technical perspectives, consider the complexities of the networks of stakeholders their design is facing and the affordances that can bring a proposal to fruition. Exploring beneficial and dangerous affordances applies to material and social artifacts alike and it is certainly facilitated by the spread of digital technologies that offer their users numerable alternatives.

Ethical considerations arise when designers decide to support some and disabling other affordances. Enhancing the products of one corporation invariably disadvantages another. There is nothing wrong with competition. It can drive innovation. However, corporations are made up by employees who are committed to communicate with each other about their responsibilities they share for what they do. Corporations are abstract entities, people are not. For these reasons, the **ethical imperative for designers** I have been advocating concerns the people who face an amazing array of alternatives and dangers in their place of work, at home, in the public sphere, and as members of discourse communities that construct meaningful worlds for them.

I am suggesting that designers commit themselves to refrain from proposing artifacts whose affordances benefit one discourse community at the expense of another.[13] To live up to this imperative, design discourse ought not be subservient to the interests of stakeholders who pay for developing designs; not to ignore communities who are affected by particular technologies but whose concerns are oppressed; not to dismiss our bio-physical environment whose ecology has created human beings but does not have a voice of its own; and not to become a narrowly defined discipline that carelessly dismisses its effects as merely "unintended.[14]"

[12] Steve Sloman & Philip Fernbach (2017) op. cit.[4]

[13] Klaus Krippendorff (in press). Communication, conversation, discourse and design. Op.cit.[8] For an earlier reference, see Section 2.6 in Klaus Krippendorff (2006), *The semantic turn*. Op. cit.[6]

[14] See Gregory Bateson (2000). Conscious purpose versus nature. Pp. 432-453 in his *Steps to an ecology of mind*. Chicago, IL: University of Chicago Press,