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From Uncritical Design to Critical Examinations of its Systemic Consequences

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Klaus Krippendorff researches the role of language and dialogue in the social construction of reality. Klaus Krippendorff's research focuses on the role of language and dialogue in the social construction of reality: identities, institutions, cultural artifacts, power, Otherness, and meanings; emancipatory epistemology (hermeneutics) of human communication and the design of technology; content analysis, semantics, pragmatics of social interaction, and related research methods; conversation theory, information theory, and cyberspace; and second-order cybernetics of complex communication systems and their reflexive, self-organizing, and autopoietic properties. From University of Pennsylvania | klaus.krippendorff@asc.upenn.edu

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From uncritical design to critical examinations of its systemic consequences

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a brief history of (product) design

the industrial revolution made individual craftsmen and women's workplaces no longer feasible, forced them into joining factories as laborers with the promise of making everyday artifacts more readily available.

fine artists, architects and other creative professions were less effected by this shift.

However, manufacturers soon recognized that expansion of their markets depended on making products more attractive and started to hire artist to improve the appearances of their products. Artists sold themselves as experts on aesthetics into the employments of manufacturers whose interest was only gaining economic advantages over competitors of which designers knew little.

in opposition to designers surrendering their soul to industrial mass production, **william morris** was a founder of the 19th century british **arts and crafts movement**, celebrating products that represented their materials fairly and excluded the decorative ornamentations meant mainly to encourage buyers.

unfortunately, the products it generated in opposition to what benefitted mass production had to be factory produced as well, were more expensive and available mainly to richer customers.

Nevertheless, morris' ideas were internationally celebrated and facilitated other design movements.

a brief history of (product) design (cont.)

frank lloyd wright was inspired by morris' ideas but differed regarding the use of machines.

in france, "art nouveau" sought to oppose industrial production by using natural forms, not found in factories, but it did not diminish mass production. instead it became usurped by industry expanding its markets through diversification.

In austria, the "wiener werkstätte" opposed the "evils of industrial production" but could not make inroads against its dominance either.

In germany, a group of craftsmen worked with manufacturers opposed to meaningless ornamentation. it nourished a movement called the "werkbund" propagating form and function.

after ww1, the bauhaus embraced mass production but made it its mission to design products with forms that would be efficient in its use and accessible to everyone. Its socialist mission got lost in the celebration of simple geometric forms. the nazis closed it in 1933.

after ww2, in the u.s. several styles became fashionable like streamlining. the design community surrendered to the commercial interests of producers.

in germany, the avant garde ulm school of design (1953-1968) was founded by the swiss architect and concrete artist max bill, nominally to aid the reconstruction of german culture, but explicitly opposing the commercialization of design. it promoted functional forms of products embracing new materials and production techniques and was open to cutting edge scientific ideas.

my own history of involvement in design

i studied at the **ulm school of design** from 1954 – 1961. i went there with a degree and practical experiences in engineering, largely because i found engineering too confining.

although the functionalism of the ulm school dominated the curriculum, i was excited being exposed to larger design related perspectives:

ergonomics

sociology

cultural anthropology

social perception.

in ulm, and mainly through the teaching by horst rittel, we were also exposed to new scientific ideas

planning theories

systems conception

information theory

cybernetics

i wrote my thesis on the **sign-characteristics of artifacts**. it opposed the singularity of functional design criteria and semiotics by acknowledging that users approached any one artifact with diverse perspectives, calling on designers to conceptualize their proposed **artifacts as communicating** to their users what they could do for them and what dangers they could pose.

because the topics taught in ulm were developed in the u.s., in 1961, i came to the u.s. to study

my own joining of communication and design

started in ulm, but was strengthened at the interdisciplinary **institute of communication research** at the university of Illinois, urbana. it expand my knowledge into **linguistic anthropology**, put my familiarity of **information theory** on a more solid ground, and allowed me to study **cybernetics** and **systems theory** with **w. ross ashby**, one of the founders of cybernetics.

i have been a professor of **communication** at the university of pennsylvania ever since I finished my course work in urbana. contrary to scientific conventions of researching what is, my teaching and academic contributions were always design oriented, aiming to understand how realities are constructed and how social problems might be solved.

i stayed in touch with the design community, giving lectures in ulm, columbus, chicago, amsterdam, offenburg, etc. In 1984, reinhart butter of the ohio state university invited me to co-edit an issue of *innovation magazine*, based on my ulm thesis, proposing what we then called **product semantics**. this publication was followed by numerous workshops on this topic at the cranbrook academy of art, at philips in eindhoven, in helsinki in finland, monterrey in mexico. taipei in taiwan, kodaira in japan, offenbach in germany, bombay and gandhinagar in india.

in 2006, i wrote a book: ***the sematic turn***; proposing ***a new foundation for design***. It went far beyond product semantics, suggesting a trajectory of artificiality, including the design of interfaces, multi-user systems, interdisciplinary design projects. and **design discourse**.

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traditionally **linearly causal** technologies which amplified the physical abilities of human beings like hammers, cars, windmills, dams, they are build from

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cybernetics was born during a series of interdisciplinary conferences which recognized the importance **circular causal** structures that preserved the essential variables of biological systems. circular causal mechanisms were recognized as the key to designing purposive or teleological systems

non-trivial information-driven machines:



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non-trivial information-driven machines:
starting with:



home heat controls involving thermostats

self-guiding missiles

self-diving cars

human interfaces with computers giving their users feedback on the consequences of their actions

computers searching for optimal solutions of a given problem

economic policies designed to curb inflation and maximize employment

criticality

critique is not observable.

critique involves:

detailed analysis of what exists in novel terms,
creating alternatives that may not have been recognized as such, face resistances, or opposition,
but increase the possibility to be realized.

critique can be practiced only in a **language** whose terms reveal
the difference between **common perceptions** and **alternative interpretations**.

to me, critique is not to be confused with expressing dislikes or finding mistakes

arguably, the trans-disciplinary conferences on cybernetics during which that entirely new
conceptions emerged was a **critique of the common linear conceptions**

however, after cybernetics was established, and cybernetician enthusiastically applied it wherever
they could, the revolutionary cybernetics lost its criticality and **uncritical cybernetics** took over its
practices.

facing current algorithmizations

designing cybernetic mechanisms
uncritically

controllable feedback mechanisms

freeing individuals to attend to more important activities
→ thermostats, safety devices in cars, goal seeking missiles

digital amplifications of cognitive abilities

users are awed by expansions of their limitations
→ surfing the internet, computations, social media

replacing routine occupations by robots

users are doped into compliance by efficiency and low costs of services
→ bank teller machines, parking meters, stock trading automata

digitizing bureaucratic systems

users are required to comply with institutionalized routines
→ online shopping, paying taxes, communication with institutions

adaptive (learning) algorithms

users have no basis to understand results and fear harm from non-compliance
→ aptitude tests, consumer ratings, blockchain algorithms, airline schedulers

autonomous networks of computations

computers are networked beyond individual comprehension and influence.
→ regional electrical grids, automated military defenses

it favors increasingly autonomous networks
of technologies that call on their users to
become cyborgs, not human agents.

its unanticipated systemic consequences

producers grow with the number users of their products

tech companies thrive on selling user data to
corporations intent to exploit users' vulnerabilities

eliminating costly human labor enables corporations to
speed up production and grow in size and influence

digitized institutions are able to impose their algorithmic
norms over larger populations they thereby control

black box statistics and computations become
incomprehensible authorities for decision makers

omnipresent controls standardize and globalize essential
variables of society in mechanistic terms

facilitate uncontrolled growths of its externalities =
digitized corporations, which impose the very
algorithmic norms on society they thrive on.

facing current algorithmizations

uncritical cybernetics

enthusiastically embraces **the efficiency and capacity** of new cybernetic technologies
results are believed to be **affordable by nearly everyone**. technologies are socially neutral
facilitates **global communication**, “the glue that holds society together”

actually: it creates **complex technological networks** exceeding human understanding
supports increasingly **autonomous systems** that defy human control
supports **growing corporations** controlling governments

critical cybernetics

seeks to find a balance between **the advantages of employing computational systems**
and **preventing involuntary transfer of human agency to technologies**

Keywords: **augmenting intelligence, not replacement it**
overcoming algorithmic oppression,
supporting individuals creativity, rendering their communities viable

conceptualizes **social organizations as reconstitutable and serving their human constituents**
opposes conceptions of their **members as serving an organization's viabilities**

promotes an **emancipatory discourse** enabling users to recover their agency

facing current algorithmizations

practicing design uncritically

pursuing styles, fashion and personal preferences

the arts and crafts movement advocated crafts and “honest” use of materials

replacing outdated by latest styles: art nouveau, de stijl, dada, encouraged consumption by aesthetic updating.

universal design serves to expand markets without the need for responding to cultural differences.

following formulas, rules

form follows function, delegating the definition of functions to clients and gives manufacturers choices.

solving problems computationally stays within the confines of computers.

specializing in a method

user-centered design excludes all other perhaps more important stakeholders

ergonomics addresses only one of many needed dimensions

product semantics deals largely with human interfaces, not what leads to it, not what creates it

relying on data-based research – data reveal only of what presently exists

ethnographic methods uncover what current populations do, not what could learn.

marketing focuses on selling products with present predispositions

social media are voluminous but shallow

commitment to one or only a few larger concerns

encouraging competition enlarges markets increases sales

sustainability, efforts to protect the often neglected environment.

fairness and non-discrimination, efforts to honor ethical standards

facing current algorithmizations

practicing design uncritically

In sum, uncritical designers' conceptions of design exclude their unintended externalities, leaving them to other institutions to thrive and take advantage of design, and do not mind surrendering to what they don't care to understand

I suggested this surrender is not new:

the 19th century arts and crafts movement opposed mass production but failed to build the needed infrastructures to succeed

in the early 20th century, several art movements advocated styles opposed mass production but in stylistic terms that manufacturers could be accommodate by promoting a culture of obsolescence

the Bauhaus and the ulm school of design sought to change the culture that could embracing mass production but got lost in simple geometric forms

contemporary designers are faced with an overwhelming, largely algorithmized system that is nearly incomprehensible to designers with traditional aims

i therefore value the efforts of this conference to bring design in contact with the systems that follow.

intervening in the ecology of artifacts

intervening in the ecology of artifacts

all designs start as a proposal

● designers' proposal |

intervening in the ecology of artifacts

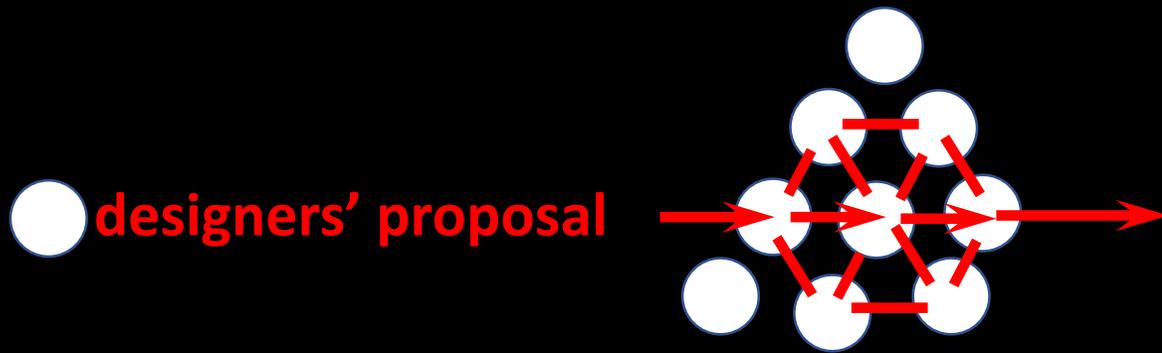
all designs start as a **proposal**

move through networks of stakeholders, (producers, bankers, distributors, even users)

stake holders possess specialized resources, capabilities, and visions

form networks of interests in a design

transform any proposal into their own plans of actions



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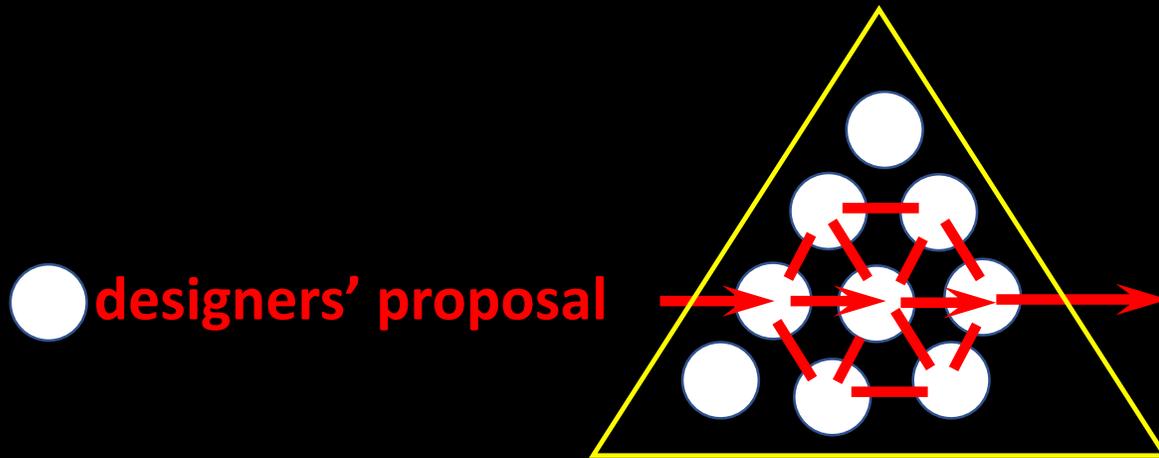
stake holders possess specialized resources, capabilities, and visions

form networks of interests in a design

transform any proposal into their own plans of actions

utilize any design for advancing

systems properties external to the proposal

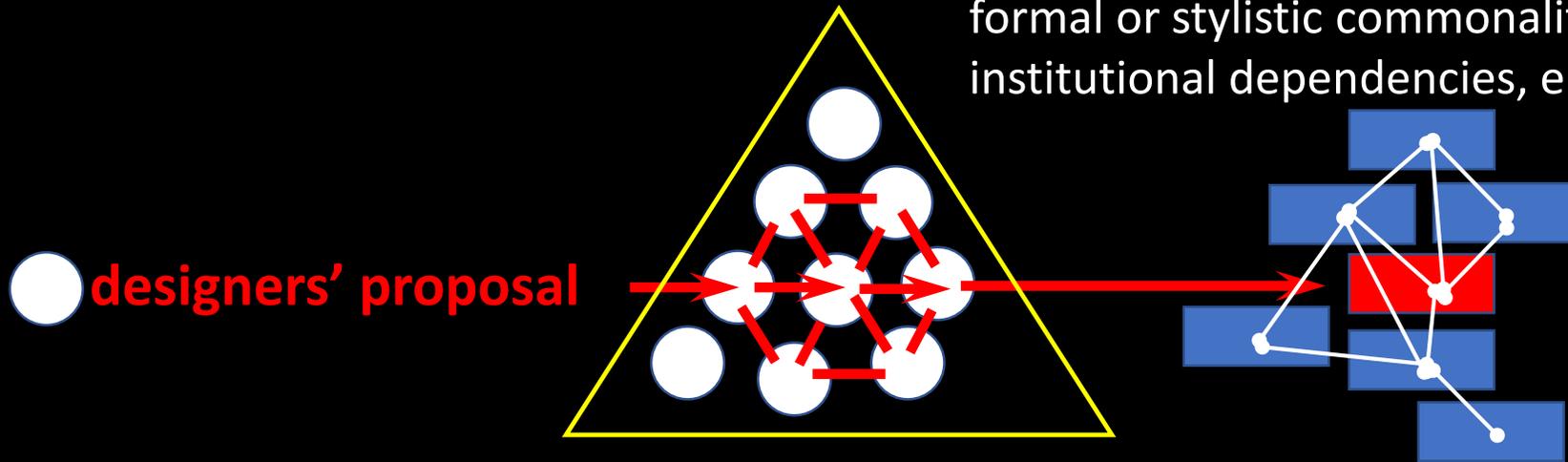


intervening in the ecology of artifacts

all designs start as a **proposal**,

move through networks of stakeholders, with resources, organizational knowhow
enter particular **assemblies** of other artifacts based on

causal dependencies, e.g., cars, roads, repair shops, oil industries.
family-defining resemblances, e.g., furniture, interior spaces
formal or stylistic commonalities: e.g., objects, clothing, art that fit
institutional dependencies, e.g., businesses, governments, courts.

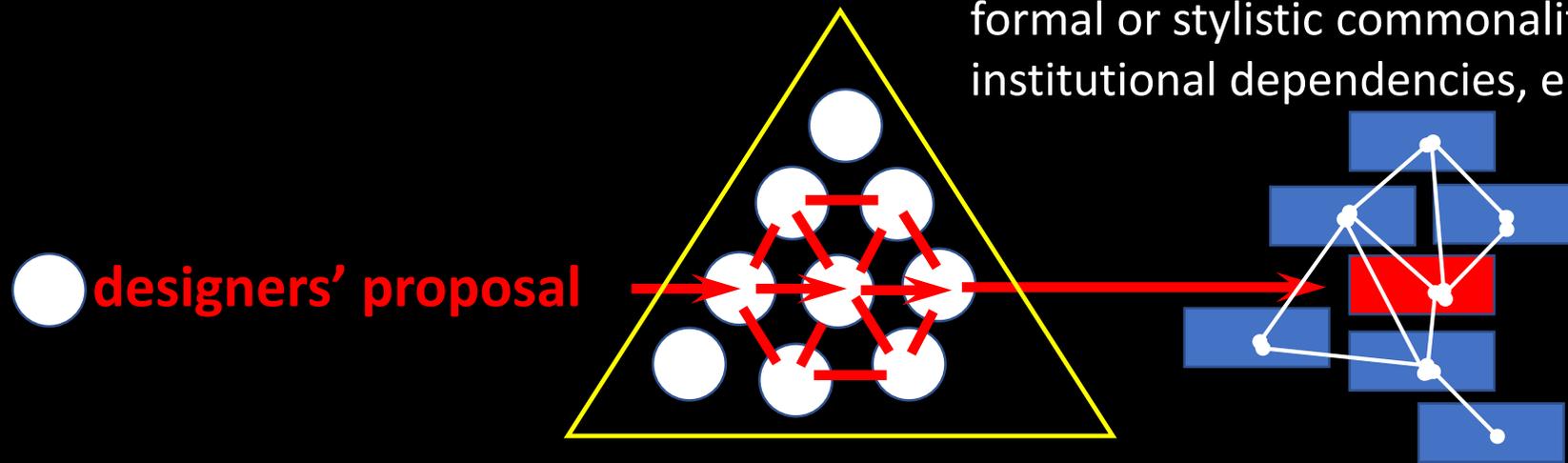


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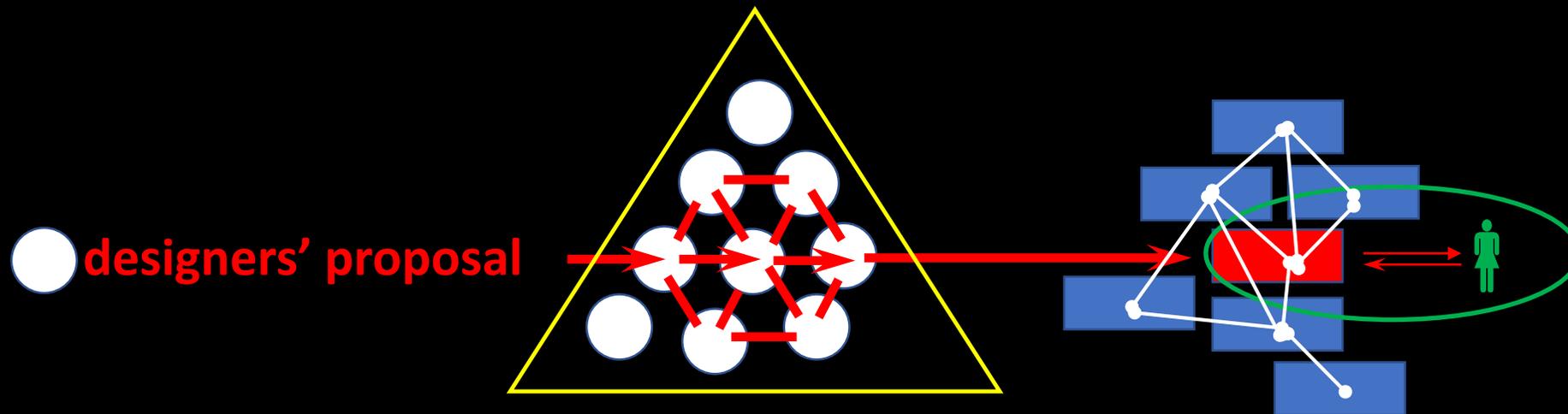
assemblies form **complex ecologies**

they **compete** with other assemblies for resources, efficiency and replacement by better artifacts
cooperate with other assemblies, forming more or less autonomous complexes

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enter particular **assemblies** of other artifacts
for the benefit or detriment of individuals



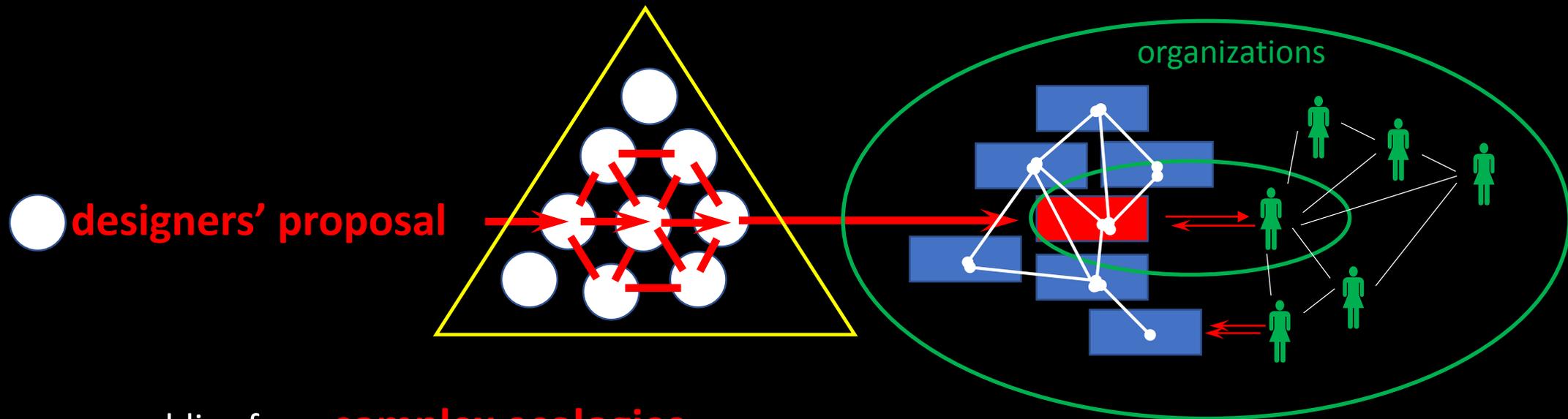
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all designs start as a **proposal**,

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enter particular assemblies of other artifacts
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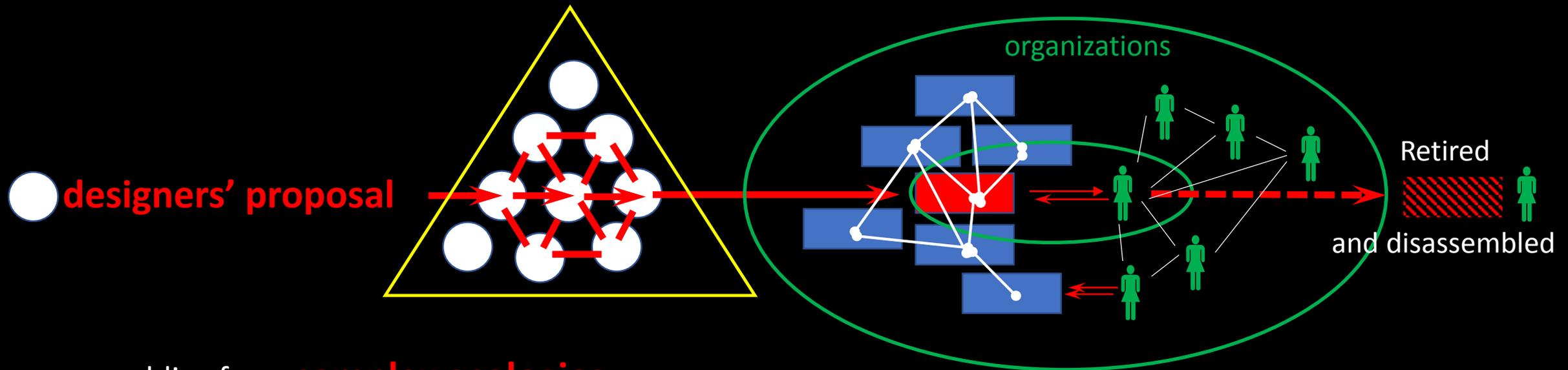
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are kept alive by humans interacting with them and with each other
nourish **organizations** beyond individual human imagination

intervening in the ecology of artifacts

all designs start as a **proposal**,

move through networks of stakeholders, with resources, organizational knowhow
enter particular assemblies of other artifacts
for the benefit or detriment of individuals, their organizations
until they are retired, disassembled and enter the environment



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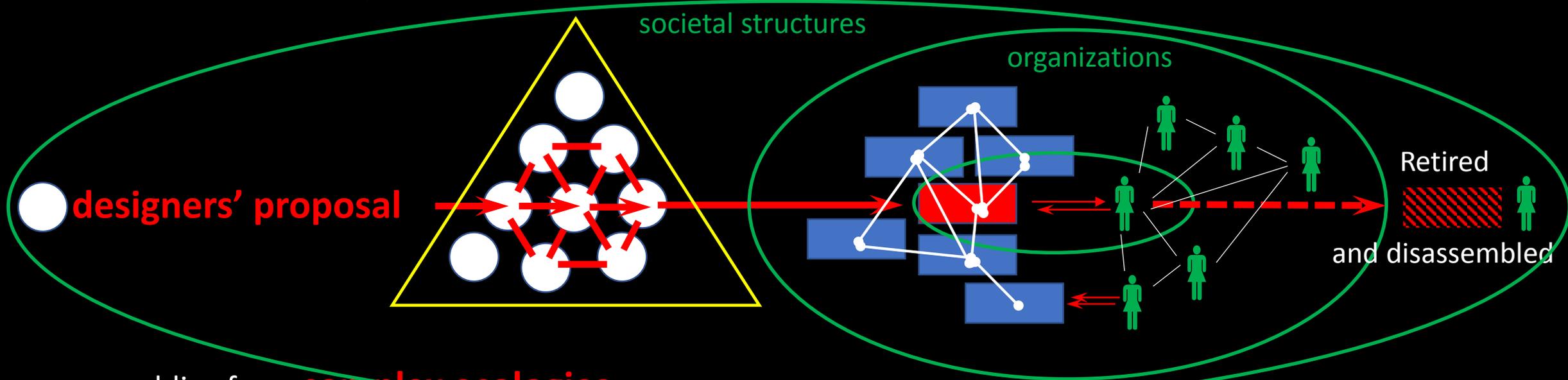
all designs start as a **proposal**,

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enter particular assemblies of other artifacts

for the benefit or detriment of individuals, their organizations, and larger institutions

until they are retired, disassembled and enter the environment



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nourish organizations beyond individual human imagination

some propositions

of a design discourse guiding designers to enter complex systems critically and responsibly

questioning design specs by reference to larger systemic obligations. This amounts to always acknowledge **there are no end-user**. all proposals are transformed as they pass through many stakeholders **artifacts can serve many functions**, not one. different stakeholders have different conceptions. **functions** are always derived from a larger system they are to serve – which system do they support? **problems are defined by institutions specializing in their solutions**. designer have to find their own missions **critical design intervenes, ideally transforms** the socio-technical ecology in which it enters **all communities** need to be protected from the unintended consequences of any design

proposals for any design need to

assure the availability of the physical conditions for a design to work: resources, institutional support, **provide compelling narratives that enroll stakeholders into cooperating networks**. outline paths to retirement **enable their subsequent developments** to adapt to unanticipated changes **anticipate developments by other designers** **invent spaces for others to design their own worlds**. delegating design

Research is focused less on facts but on creating unexplored possibilities

identify unarticulated frustrations and felt oppressions of human agency in need to overcome **new combinations of available materials and technologies** to be tried out **prediction of ecological problems** to be prevented **increase the diversity in the ecology of artifacts** for the benefit all stakeholders' actions.

in sum:

criticality calls on designers to develop a **design discourse** aimed at keeping the **culture** in which they work **viable** while protecting the socially desirable **human agency** of its constituents
defined as the ability to choose socially responsible actions

Critical design

should always consider the viability of organizations secondary to the viability of their human constituents
actively identify and create remedies against socio-technological oppression of human agency
explore currently unimaginable possibilities in conversations with those open to them
delegate some design – create spaces for its potential stakeholders to design their worlds
invite potential stakeholders into interdisciplinary cooperation
increase the diversity of the ecology of artifacts into which designs enter
preserve the openness of its own critical design discourse
teach and promote the virtues of design as an undisciplinable profession