The strengths / limits of Systems Thinking denote the strengths / limits of Practice-Based Design Research
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„There is no purer myth than the notion of a science which has been purged of all myth.“  Michel Serres
1 Introduction / framing

Science claims the separation of the human (society) and the non-human (nature).

Latour (1998): „Science and society cannot be separated, they depend on the same foundation. ...“

Design has always known this. Design Research can build on it ...
2 Practice-Based Design Research (PBDR) as focus of interest

Design as a process of "generating the unknown from the known" (Hatchuel).

Descriptive Analysis, normative Projection and Synthesis are essential.

Controversies regarding the scientific validity of PBDR.

Adaptation to scientific standards impedes learning processes.
3  Fundamental problems and causal gaps

Problems of control, problems of prediction, incompatible domains of knowing lead to causality gaps.

Schön (1983) states the dilemma of “rigor or relevance”.

“high ground” - “swampy lowlands”

Required:
- an appropriate notion of complexity,
- ways of dealing with uncertainty,
- an integrative epistemological framework,
- the reflection of observer involvement.
4 Unresolvable blind spots

Blind spots comprise:
- unconscious and intransparent value systems,
- implicit driving forces,
- biased, selective, unreflected pasts,
- pseudo-objective scenario-techniques.

Blind spots are the necessary condition of every observation.

>>> use as many incoherent perspectives as possible
5 Paradox and oxymoron

Rittel reveals the paradoxes: Planning as creating, exploring and reducing variety, Issue-Based Information Systems, planning as an argument ...

Krippendorff calls design research an “oxymoron”: Design as the social construction of meaning through language by stakeholders ...

>> Rorty suggests narrative, speculative, poetic methods ...
Research Through Design (RTD) as an implementation of PBDR - C1

Design and Design Research as a cybernetic process of experiential evolutionary learning (Kolb).

Research Through Design (RTD) with ANALYSIS - PROJECTION - SYNTHESIS is one possible realization of PBDR. Note the analogy to the terminology of Transdisciplinarity Studies.

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7 Systems Thinking constitutes RTD processes

Systems Thinking allows for the modelling of complex design / inquiring systems and thus provides a means of communicating about them and of communicating within them.

A purely scientific approach is unsuitable.

The differentiation between Design and Research is fuzzy, the transition is continuous.

Design Research is done in a „designerly“ mode with scientific support.
Reflecting observer modes - RTD requires the shift from C1 to C2

Distinguish between classical detached inquiry and situated inquiry.

C2 contributes to substantiate the concepts of research FOR / ABOUT / THROUGH design. A fourth mode shows up: research AS design.

<table>
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<tr>
<th>Observer position and perspective relative to the design / inquiring system and the life-world</th>
<th>1st order cybernetics</th>
<th>2nd order cybernetics</th>
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<tr>
<td>Observer is situated outside the design / inquiring system producing facts</td>
<td>Observer is situated inside the design / inquiring system producing (arte)factual facts based on values</td>
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<th>Observer looking outwards</th>
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<th>research ABOUT design</th>
<th>research AS design (?)</th>
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9 Zooming in: RTD and (critical) systems thinking

The RTD model comprises three core systemic dimensions:
the wider context (yellow), the design / inquiring system (red), and the driving force (blue).

In Science:
- the wider context is excluded as far as possible,
- the design / inquiring system is considered as disembodied, objective, Cartesian observer,
- the driving force remains implicit.
10 Relating RTD to a generic scenario model CFU

The „Cube of Future Uncertainty“ (CFU) is a generalized framework for scenario approaches, defined by the three above mentioned systemic dimensions of RTD:

- the wider context
- the design / inquiring system, and
- the driving force,

and thus establishes the systems-based connection between ANALYSIS and SYNTHESIS by means of PROJECTION.
11 So what? Turning deficits and threats into strengths and opportunities

- **Systems thinking** and the positive acceptance of multi-perspectivity.
- The adoption of **generative approaches** as „playgrounds“ for exploration.
- The explicit integration of **facts and values** into our systems of inquiry.

Ulrich´s **Critical Systems Heuristics** provides a promising approach.

CSH comprises the reflection and determination of system **boundaries** and **driving forces** as well as questions of **legitimacy** ...

... influences from Churchman, Rittel, Simon, Vester, ...
12 Perspectives: Design as the new model for Transdisciplinary Science

- Science as a **sub-category** of Design (Glanville).

- The concept of *Mode-2 science* emphasizes socially robust instead of true knowledge.

- **Transdisciplinarity** addresses all the indecent issues of designerly inquiry and takes them as the basis for a new kind of science.

  >> Relation to „third phase science“ (de Zeeuw)

  >> Epistemic democracy (Dewey)

  >> Design and Science - approaching each other (Jonas)

  >> ...
The strengths / limits of Systems Thinking denote the strengths / limits of Practice-Based Design Research

„In other words, why not transform this whole business of recalling modernity into a grand question of design?“ Bruno Latour