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Beyond Dualisms in Methodology:

An Integrative Design Research Medium "MAPS" and some Reflections

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Abstract

Design research is an academic issue and increasingly an essential success factor for industrial, organizational and social innovation. The fierce rejection of 1st generation design methods in the early 1970s resulted in the postmodernist attitude of "no methods", and subsequently, after more than a decade, in the strong adoption of scientific methods, or "the" scientific method, for design research. The current situation regarding methodology is characterized by unproductive dualisms such as scientific methods vs. designerly methods, normative methods vs. descriptive methods, research vs. design. The potential of the early (1st generation) methods is neglected and the practical usefulness of design research is impeded. The suggestion for 2nd generation methods as discussed by Rittel and others has hardly been taken up in design. The development of a methodological tool / medium for research through design – MAPS[1] – (which is the central part of the paper) presents the cause and catalyst for some reflections about the usability / desirability / usefulness of methodical support for the design (research) process.

Keywords

Integrative Design Research Medium, Research Through Design, MAPS, Methodology

Context of the research

The fierce rejection of 1st generation design methods in the early 1970s resulted in the postmodernist attitude of "no methods", and subsequently after more than a decade, in the strong adoption of scientific methods, or "the" scientific method, for design research. The potential of the early (1st generation) methods is neglected and the practical usefulness of design research is impeded as a result of the strong scientific bias. Besides, suggestions for 2nd generation methods as discussed by Rittel (1972) and others have hardly been taken up in design. The current situation regarding methodology is characterized by unproductive dualisms such as:

- scientific methods – designerly methods
- proper research – research through design
- pre-rationalization – post-rationalization
- descriptive methods – normative methods

[1] "MAPS" stands for Matching Analysis Projection Synthesis.

- 1st order methods – 2nd order methods
- control – conversation
- tool - medium
- research – design
- rigourous - undisciplined

There is no doubt that design and innovation projects today are increasingly knowledge-intensive and research-based. Nevertheless uncritical adoption of the scientific methods is showing strains when dealing with it. We do not deny that certain sub-problems in design research projects need proper scientific approaches, but we suggest that the scientific approach alone is not sufficient.

Design Research is both an academic issue and increasingly an essential success factor for industrial, organizational and social innovation. The problems of design and innovation in industrial, organizational and social contexts are characterized by complexity on the problem side and contingency on the solution side. The current methodological dualisms fail to address these issues as a whole. Resolving the dualisms is a must if design research is to proceed to fulfil its potential.

The request for accelerated and systematic innovation suggests a need and an opportunity to adopt design as the generic process model of innovation. The emerging paradigm of "research through design" (Jonas 2007) provides a methodological and epistemological model for bridging the gap and creating the relation between "problems" and "solutions", that means for problem definition (dealing with complexity), solution generation (dealing with contingency) and project formation (dealing with the process that generates new facts and artefacts = forms). It also holds promise to end the dualisms by integrating both. The challenge now is to efficiently operationalize these theoretical concepts. The "toolbox", which is presented in chapter 1.2, is based upon a generic process model and presents a first step towards this aim.

A generic process model

Hugentobler, Jonas and Rahe (2004) have developed a methodological approach based upon evolutionary principles of knowledge generation. It describes the design (research) process generically as a hypercyclic process of learning and has been applied in several design projects (see for example Morelli, Jonas and Münch 2008).

Three domains of knowing (the macro cycle of ANALYSIS - PROJECTION – SYNTHESIS, similar to the concepts of "the true", "the ideal" and "the real" (Nelson and Stolterman 2003) and within each of them, four learning steps (the micro cycle of research – analysis – synthesis – realization, according to Kolb 1984) plus COMMUNICATION constitute the hypercyclic scheme (see fig. 1, in linearized form). Each of the cells contains various methods and tools that can be combined and configured into problem-specific processes. At first glance, the "toolbox" appears to be a somewhat rigid, normative scheme, leaving little freedom for the so-called creative process. The impression of rigidity is misleading, or rather, the degree of its flexibility depends upon the interpretation of the scheme: COMMUNICATION, i.e. the reflection of the

communication mode in which the scheme is used is essential. It can be regarded as a normative schedule (pre-rationalizing a process) or as a descriptive instrument (post-rationalizing what has been done in a project) or in any other mode in-between these poles.

		Steps of the iterative micro process of learning / designing			
		research	analysis	synthesis	realization
Domains of design inquiry, steps / components of the iterative macro process of designing	ANALYSIS "the true" how it is today	How to get data on the situation as it IS? → data on what IS	How to make sense of this data? → knowledge on what IS	How to understand the situation as a whole? → worldviews	How to present the situation as IS? → consent on the situation
	PROJECTION "the ideal" how it could be	How to get data on future changes? → future-related data	How to interpret these data? → information about futures	How to get consistent images of possible futures? → scenarios	How to present the future scenarios? → consent on problems / goals
	SYNTHESIS "the real" how it is tomorrow	How to get data on the situation as it SHALL BE → problem data	How to evaluate these data? → problem, list of requirements	How to design solutions of the problem? → design solutions	How to present the solutions? → decisions about "go / no go"
	COMMUNICATION "the driver"	How to establish the process and move it forward? How to enable positive team dynamics? How to find balance between action/reflection? How to build hot teams? How to enable equal participation? → focused and efficient teamwork			

Fig. 1: The hypercyclic process, linearized into a "toolbox": categories of innovation and design methods and tools, questions and results.

The toolbox in fig. 1 provides the basis for MAPS. The subsequent development of MAPS contributes to the clarification of the different modes of interpretation and operation of the scheme as a discursive and productive medium. MAPS is aimed to dissolve the toolbox' apparent rigidity and its conditioning.

Some basic design concepts / assumptions

Some terminological and conceptual clarification regarding the underlying assumptions and the understanding of research in the context of MAPS is necessary. One way to categorize / differentiate design research is the distinction of research FOR, ABOUT and THROUGH design (Archer 1981, Frayling 1993, Findeli 1998, Jonas 2007).

- **Research FOR Design** is acting from outside, aiming at supporting the process in certain steps. Researchers are "knowledge suppliers" for designers. For example: market research, user studies, ..., product semantics, etc. Research FOR design is defined / determined by underlying basic assumptions / theories regarding the design process (What is design? How does it work?) Emphasis lies on the analytic / methodological aspects of the research / learning cycle.

According to Findeli (2008) research for design is relevant, but not necessarily rigorous.

- **Research ABOUT Design** is also acting from outside, keeping the subject of inquiry at a distance. Researchers are scientific observers, trying not to influence their subject. For example: design philosophy, design history, design theory, design critique, etc. Research ABOUT design is defined / determined by motivations aiming at inquiring the "nature" of diverse aspects of design. Theories ABOUT design, at times, prove to be impositions of alien disciplines. Findeli characterizes research about design as rigorous but not necessarily relevant.

- **Research THROUGH Design** denotes the designerly process of inquiring and making, which should she both relevant and rigorous. The designer / researcher is immediately involved to create relations and to design the subject matter of research. For example: "wicked problems" such as a preventive healthcare concept for children. Research THROUGH design is defined / determined by basic assumptions regarding the purpose of designing (What is design good for?) Emphasis lies on the synthetic / generative aspects of the research / learning cycle.

With respect to our research question (see 1.4), we argue that to operationalize research through design, the instrument which we name MAPS must have the following functions and characteristics:

- MAPS is an instrument FOR design (→ normative, aiming at pre-rationalization),

- MAPS is based upon assumptions that are results of research ABOUT design (→ descriptive, post-rationalization of existing processes / models),

- MAPS is aiming at the support of research THROUGH design (→ conversational, an interplay of pre- and post-rationalization).

Since innovation is knowledge-intensive and requires contributions from diverse disciplines, attempts to operationalize must assure that the scientific methods are integrated into the designerly process. Glanville (1980) has been arguing convincingly that scientific research should be conceptualized as a subset of design. He demonstrated that research is a (restricted) design act, rather than design being an inadequate research. We adopt this train of thoughts.

Innovation is about novelty generation or the creation of new stable objects or forms, of in-form-ation (Glanville 2008). This has often been neglected in the past. The logical syllogisms of induction and deduction are obviously unable to explain the generation of new facts and artefacts. Based upon pragmatist concepts from Peirce (Davis 1972), Dewey (1986) and others we consider abduction to be the central mental and social "mechanism" of knowledge generation in general (applicable in everyday life, in the designerly as well as in the scientific process). It is the abduction step, which is able to combine the otherwise sterile syllogisms of induction (formulating a general rule out of existing data or cases) and deduction (deriving special cases from universal rules) into a productive learning cycle with the potential of creating

something new. Without abductive reasoning only "normal science" (Kuhn 1973) would be possible.

March (1984) states clearly: "As Peirce writes: abduction, or as we have it production, 'is the only logical operation which introduces any new ideas; for induction does nothing but determine a value; and deduction merely evolves the necessary consequences of a pure hypothesis'. Thus, production creates, deduction predicts; induction evaluates."

Roozenburg (1993) renders these considerations more precisely. He differentiates between explanatory abduction and innovative abduction and concludes that it is the latter, which should be taken as the 'paradigm' model of the crucial step in the design process that generates the new: "In explanatory abduction it is assumed that the rule (of the syllogism) is given as a premise; innovative abduction aims at finding new rules. …"

In more designerly methodological terms we speak of ANALYSIS (the inductive phase), PROJECTION (the abductive phase) and SYNTHESIS (the deductive phase).

The further clarification of the abductive mechanisms in the PROJECTION phase in designing is essential for the development of genuine designerly concepts of research.

Furthermore, a successful approach needs to reflect on the necessary (cybernetic) involvement of the designer / researcher in the process. He / she acts as a kind of steersman aiming at a goal, to be taken literally, which means that we have to reflect on the modes of observation. Glanville (1997) presents an attempt at clarifying the different modes of involvement in the design / research process in a 2nd order cybernetic perspective. And we will elaborate on these in section 4.2.

Observer position Observer looking	Outside the design system 1st order cybernetics	Inside the design system 2nd order cybernetics
outwards	research FOR design	research THROUGH design
inwards	research ABOUT design	inaccessible

Fig. 2: The concepts of research FOR / THROUGH / ABOUT design – as related to the cybernetic concept of observer positions with respect to the design system (where design activities take place, see Glanville 1997).

1.4 Questions and hypotheses

The research question is: How to integrate design methods and scientific methods so that they become operable?

Our hypothesis is that this can be done under a 2nd order cybernetic perspective, which accounts for the necessary and inevitable involvement of the designer / researcher in the process.

The project is based upon two major assumptions:

a) There is more continuity in methodology than normally assumed. From a 2nd order cybernetic perspective, it is possible to integrate the early (1st generation) methods as well as scientific methods into a more continuous and homogeneous concept of 2nd order design methodology.

b) Research THROUGH design is the appropriate paradigm of systemic knowledge generation in science and design today (Glanville 1980, Knorr-Cetina 1981, Latour 1991, Nowotny et.al. 2001, Rheinberger 2001, Jonas 2007).

Overview Of Maps

Glossary

PSS	Product Service System: the object of design activities
Context	factors that impact on the design of the PSS, but cannot be controlled by design activities
Situation	current status of the system as a whole (PSS and its relevant context)
Process	iterative and controlled development of change
Method	configuration of tools (to gain knowledge for certain purposes)
Tool	auxiliary skills, techniques, materials
Project development	defined process with start and end points, aiming at the of a specific PSS (research is included here)
Project dimension	main parameters of project, referring to complexity, knowledge input, uncertainty and realisation
Project domain	main orientation of project, referring to technology, business/market, human-centeredness
Project constraint	limiting conditions of a project, concerning financial, human and temporal resources
Process type	general characterization of project, emphasizing ANALYSIS, PROJECTION, SYNTHESIS – the role and specific function of design

Project descriptors

MAPS is made operable by first introducing a number of concepts: project dimensions, project domains, project constraints and process types. These are

concepts used for the stepwise specification of a situation, which needs to be improved, i.e. at the definition of a problem-solving or innovation project, (see Glossary in 2.1 for details).

2.2.1 Project dimensions

Four concepts are used to describe the project dimensions.

- **System**: scope of contextual factors to be considered: market, society, environment, etc. (degree of complexity)

- **Research**: scientific requirements to be considered (degree of scientific knowledge input)

- **Future**: projective time space to be considered (degree of uncertainty)

- **Implementation**: executive requirements (degree of realisation)

The dimensions can have three values: low (-), medium (0), high (+)

2.2.2 Project domains

Three concepts are introduced for project domains (fig. 3):

- **Technology**

- **Business / market**

- **Human values**

Each combination of domains requires different use of methods and tools.

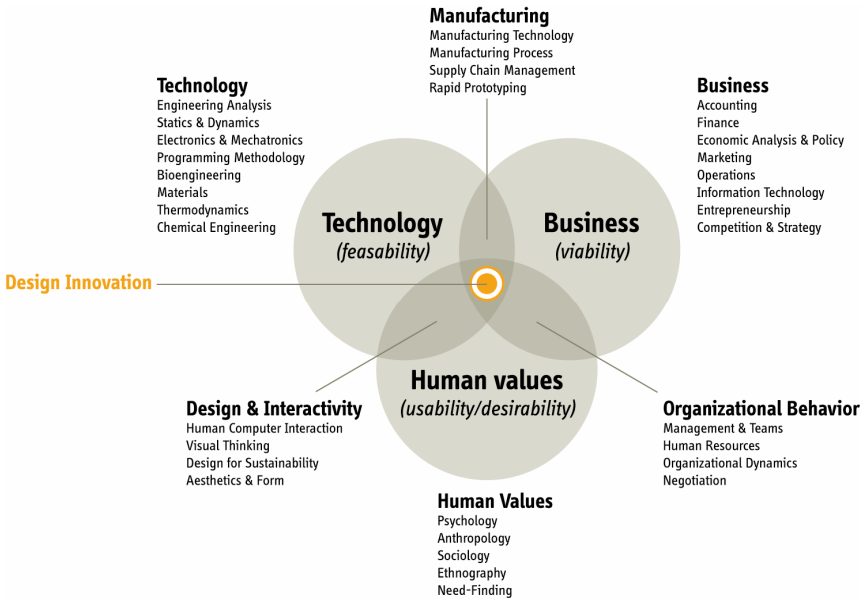

Fig. 3: Project domains: technology, business, human values. A project may comprise one, two or all of them.

2.2.3 Project constraints

Project constraints consist of five areas:
- **Schedule**
- **Budget**

- Human resources
- Technical equipment
- External partners

2.2.4 Process types

Seven generic process types are derived from the hypercyclic toolbox (fig. 1) and are related to project dimensions and process patterns. The process type clarifies the role of design research with respect to scientific research and implementation aspects.

ANALYSIS				PROJECTION				SYNTHESIS				
												1 a "complete" design (research) process
												2 a futures studies process (without synthesis)
												3 a "normal" design process (without proper projection)
												4 a "risky" design process (not properly grounded in what IS)
												5 an analytic process (inquiry into "the true")
												6 a projective process (inquiry into "the ideal")
												7 a synthetic process (inquiry into "the real")

Fig. 4: General categorization of innovation, design and design research process types.

2.3 Functions and modes of MAPS

MAPS assists design researchers and their collaborators to:

1) Specify / categorize (problem) situations,

2) Match process patterns to the specified situation (and specify the role of design research),

3) Select methods / tools related to the process.

MAPS functions in four different modes:

1) 'HELP' mode: when experienced design researcher needs to locate quickly references on design research process, methods, tools.

2) 'INSTRUCT' mode: when design researcher needs step-by-step instruction on design research process, methods and tools.

3) 'PROMOTE' mode: when design researcher needs to explain the value and process of design research to partners and clients quickly.

4) 'COLLABORATE' mode: when design researcher needs to work closely with partners and clients.

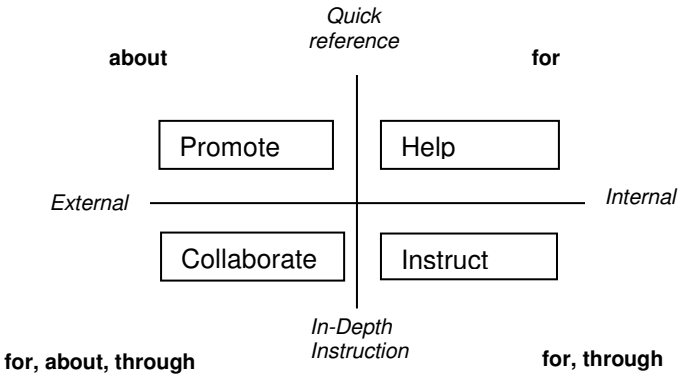

Fig. 5: MAPS operates in four different modes.

2.4 The wider MAPS system

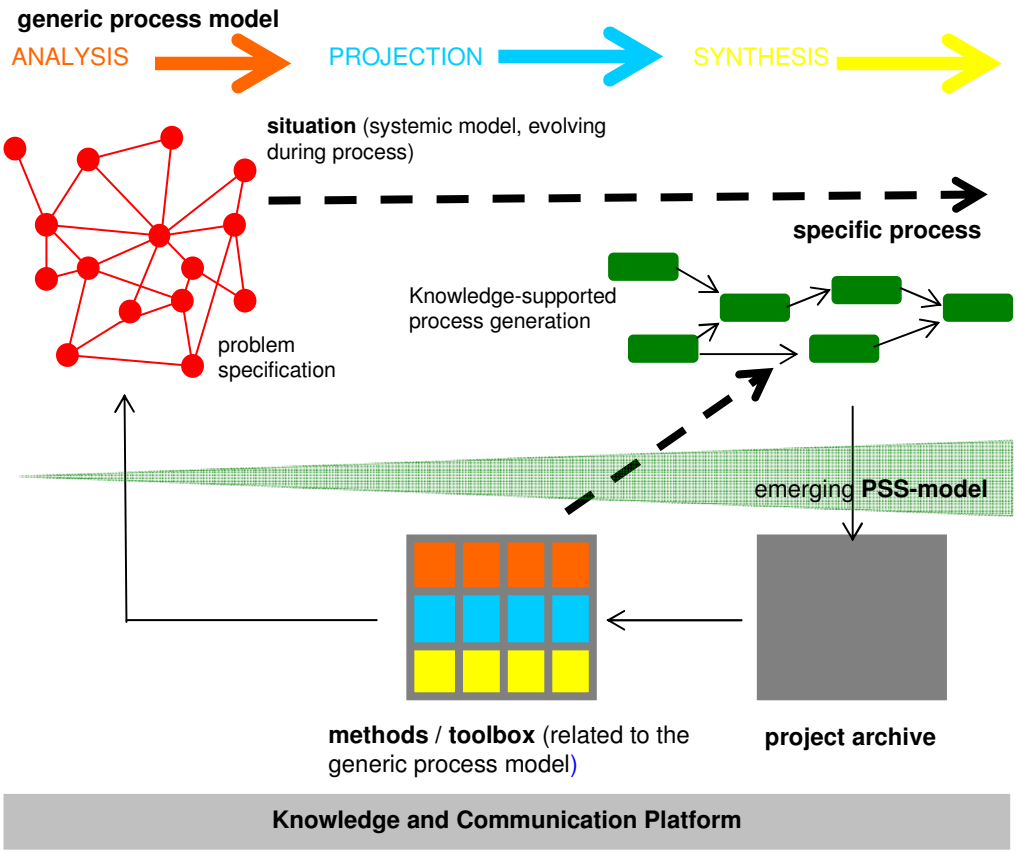

Fig. 6: General overview of MAPS.

Fig. 6 describes the MAPS concept and use in some more details:

MAPS is aiming at the support of practice-oriented design, innovation and research processes. The long-term aim is the development of an integrated knowledge and communication platform for research THROUGH design. The outcomes of research through design projects are Product-Service-System (PSS) models in the widest sense.

MAPS starts with the problem specification and a systemic model of the problem situation. From that a preliminary proposal for a specific process is derived, based upon the generic process model and using methods and tools from the toolbox (this is pre-rationalization). The proposed process can be modified according to new and changing insights and requirements any time, so that MAPS has the function of a communicative / reflective tool during the process. The final process can be documented and stored in a project archive for further evaluation and use (this is post-rationalization).

The growing project archive will feed the toolbox and will generate new knowledge regarding the appropriate use of methods for the configuration of processes. Prototypical processes for certain situations may emerge, so that transferability of processes will be a longer-term effect of the use of MAPS.

3 OPERATIONALIZATION OF MAPS

MAPS is designed to construct a fuzzy / flexible / adaptable connection between situations / contexts on the one hand and processes and methods / tools on the other hand in order to support the development and implementation of projects. The following describes the operational steps in detail.

3.1 Specify problem situation

3.1.1 Identify the overall process by determining the values of the project dimensions.

	ANALYSIS				PROJECTION				SYNTHESIS				
System (provide consistency)													Emphasis on the whole macro cycle: systemic modelling approaches
Research (build knowledge)													Emphasis on knowledge generation: scientific approaches
Future (create options)													Emphasis on creating future images: scenario approaches
Implementation (realize solutions)													Emphasis on realizing solutions: prototyping approaches

Fig. 7: Project dimensions in relation to the toolbox model and to procedural and methodological emphasis as derived from fig. 4.

System Dimension

The system dimension identifies and considers the scope of contextual factors: users, stakeholders, market, society, environment, etc. It thus characterizes the degree of complexity of the situation and degree of uncertainty / contingency of the future situation that the project is aiming at. A high value of systemic dimension indicates that the reduction into isolated sub-tasks is risky and that integrative systemic tools (modelling, systems analysis, simulation) for dealing with the complexity and uncertainty of the task are required.

Dimension	***Main Questions***			
System	What is the aim of the project?	Redesign of existing PSS	New for company / organization	Exploration of the new
Research	What kind of knowledge needs to be acquired?	Existing Knowledge	New applied knowledge	New fundamental knowledge
Future	How long term does the PSS deal with? (relative to the field.)	Short term	Medium term	Long term
Implementation	What is the project outcome?	Concept / feasibility study	Working Prototype	Marketable PSS
		Low	***Medium***	***High***

	Value	***Value***	***Value***

Table 1: Project dimensions exemplified in terms of an innovation project.

3.1.2 Decide on the project domain (technological, business / market, human-centeredness)

Domain	***Main Question***	
Technology	What is the project focus?	Technological development or breakthrough
Business		Finding a business opportunity
Human Values		Discovering users values

Table 2: Project domains exemplified in terms of an innovation project.

3.1.3 Specify project constraints (time, budget, etc.).

Constraints	***Main Questions***			
Schedule	How is the project scheduled?	Open	Reasonable	Tight
Budget	How is the budget?	Ample	Sufficient	Tight
Staff	How is the project staffed?	Well	Sufficient	Understaffed
Equipment	How is the availability of the equipment?	All available	Ordinary equipment required	New equipment required
Collaborator	Are external partners needed?	No	Partly	Very much
		Low Value	***Medium Value***	***High Value***

Table 3: Project constraints exemplified in terms of an innovation project.

This process to specify, or to tag a situation is operationalized into a kind of questionnaire (see fig. 8). An analogous method of parametrization is used for tagging the available methods and tools. The result can then be used for the knowledge-based, semi-automatic generation of preliminary processes (pre-rationalization, see 3.3 below).

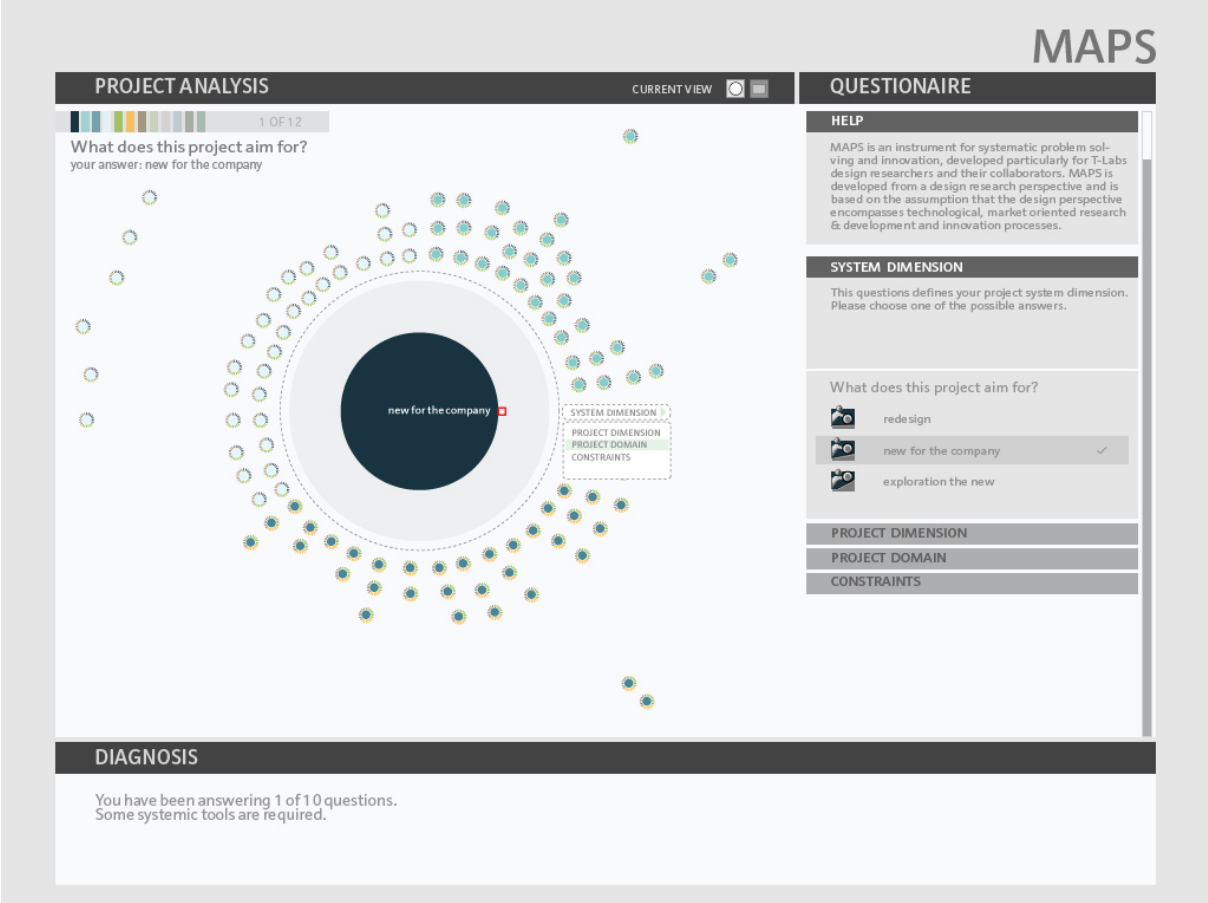

Fig. 8: Interactive questionnaire for project specification. Here, the question about the system dimension is shown. The 'Diagnosis' is composed of dynamic text which changes according to the answer. The small circular dots represent individual methods. The needed methods are shown according to the analysis.

3.2 Match process patterns to specified situation

Once a situation is specified in terms of dimensions, domains, types and constraints, it can be matched to process patterns.

3.2.1 Select the process type

The determination of the project dimensions (3.1.1) and project domains (3.1.2) helps to select a process type, using figs. 4 and 7 above.

3.2.2 Match process patterns to the specified situation and process type

Once a situation is specified in terms of dimensions, domains and constraints and the process type is selected, it can be matched to more detailed process patterns.

The Aalborg foodservice (Morelli, Jonas, Münch 2008), is a 3-week students project with the following characteristics identified by MAPS: Foodservice is high in System Dimension for it is exploring something new, low in Research Dimension for only existing knowledge is required, low in Future Dimension for the project is short term and low in Implementation Dimension because only a concept is needed. Foodservice focuses on discovering human values and

constraint mainly by a tight schedule and no budget. Using Process Type table (see fig.7), it is identified that Aalborg foodservice project is a process type 1 - a "complete" design (research) process in which all the three domains of knowledge (ANALYSIS, PROJECTION & SYNTHESIS) is required, albeit in different weighting. Figure 9 shows the project timeline and methods used.

Timeline	***Week 1***		***Week 2***	***Week 3***
Project phases	ANALYSIS mainly existing data	PROJECTION future images, contextual uncertainty	SYNTHESIS detailed concept of the PSS and exemplary realization of product proposals	
Methods to be used	Sensitivity modelling / analysis	Scenario-building essential in order to explore uncertain future contexts…	Business concepts Use-cases Prototyping User studies Quick&dirty concepts	
Project characteristics	- Systemic emphasis, system model necessary as a basis for understanding the system´s dynamics and sensitivity - Design (user values) emphasis - Emphasis on usable concepts			

Fig. 9: Example of a process pattern, derived from the situation and the process type.

3.3 Select methods / tools for the process

3.3.1 Tagging the methods according to the generic process structure

Methods and tools can be categorized / tagged with relation to their position in the underlying generic toolbox structure (see fig.1) :

- they can fit exactly into one compartment
- they can fit into several compartments
- they can cover several compartments

3.3.2 Tagging the methods according to the project specifications

Moreover, it is possible to a certain degree, to attach tags to the methods / tools with respect to their fit with the project specification:

- project dimensions
- project domains
- project constraints
- process types

Both 3.3.1 and 3.3.2 can contribute to the knowledge-supported selection of methods and tools for specific processes (pre-rationalization): Matching the profiles of the situation and of the methods / tools available establishes the link

between the four levels of MAPS (this procedure has not been realized yet!). The process pattern, which has been established up to this point, should not at all be regarded as a rigid schedule, but as a proposal, or better: a medium of conversation.

4 FINDINGS AND CONCLUSIONS

4.1 Distinctions of MAPS

It is not difficult to find descriptions and representations of processes for designing, problem solving, and innovative product development. See, for example, IDEO or MePSS. However, most of these representations, although informed by practical experiences, can hardly be considered theoretic, systematic or rigorous. And even the more thoughtful representations come short in a few critical aspects, since they:

- overlook the (problematic) situation, i.e. the relevant contextual factors,

- conflate process models with methods and tools,

- fail to distinguish the epistemological domains of knowing (the true, the ideal, the real),

- are domain-specific.

MAPS is an instrument for systematic problem solving, design and innovation, developed particularly for professional researchers and their collaborators in academic and non-academic (commercial, social) contexts. It is aimed to decrease complexity and uncertainty during problem solving and research and thus help increase efficiency and effectiveness when collaborating with partners and clients. MAPS is acting from a design perspective and is based on the assumption that this perspective encompasses technological, market oriented Research & Development and innovation processes as well as social innovation processes.

Moreover, the instrument provides a terminology, which improves the reproducibility / transferability of design processes (and possibly solution elements) towards new / similar / comparable situations.

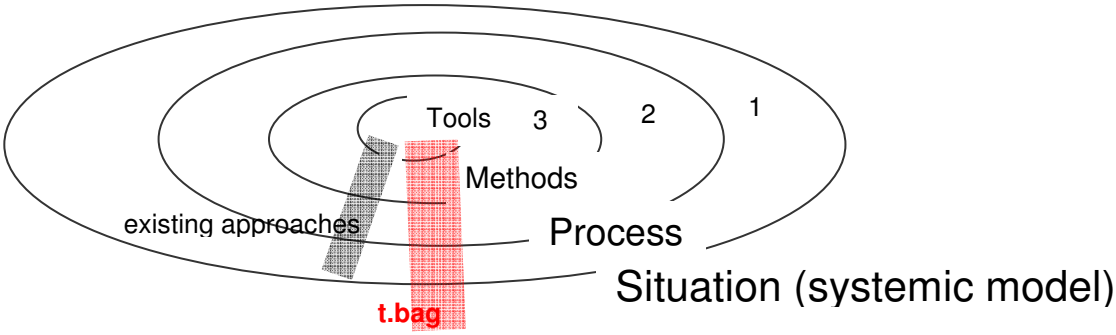

Fig. 10: MAPS is underpinned by a robust theoretical model that distinguishes, separately addresses and matches situation, process, methods and tools.

4.2 Reflections

An operational medium for design and design research has been presented. The experiences gained during the development and the application of MAPS allow us to come back to the reflections on the issue of "unproductive dualisms".

One great merit of 1st generation design methodology research in the 1960s is that generic process models have been considered in some depth. The notorious criticism of their rigidity is fully justifiable, only when these models are considered as normative standards for the implementation of design processes. However, when this misunderstanding is overcome, then the benefits of the generic models become evident. The 2nd order cybernetic approach of reflecting observation modes as introduced by Glanville (1997) brings more clarity:

Observer position Observer looking	Outside the design system 1st order cybernetics	Inside the design system 2nd order cybernetics
outwards	research FOR design method development based upon certain assumptions regarding the structure and nature of design processes	research THROUGH design method application and knowledge generation aiming at transferable innovation
inwards	research ABOUT design knowledge generation about design by means of reflective tool / method application in design projects and experiments	INACCESSIBLE Probably the essential mental and social "mechanism" of generating new ideas

Fig. 11: The concepts of research FOR / THROUGH / ABOUT design – applied to knowledge generation in design methodology. See also fig. 2 above.

1st generation methodology (as mostly conceived) provides normative methods FOR the design process. This is a seemingly scientific attitude, which neglects the researcher´s involvement and the dynamic context of every design research task. Therefore we conclude that methodological research in design only makes sense, if all observation modes are taken into consideration. Otherwise, the process remains locked in sterile assumptions, which prevent the productive use and further dynamic development of methodology THROUGH design. It is the (INACCESSIBLE) abduction step, which is able to combine the logical syllogisms of induction (formulating a general rule out of

existing data or cases – post-rationalization) and deduction (deriving special cases from universal rules – pre-rationalization) into a productive learning cycle with the potential of creating something new. Abduction is an essential "creative" concept, in design as well as in the sciences.

This is what we consider 2nd generation methodology, which is – in our view - the most important conversational medium for the generation of new knowledge ABOUT design.

- MAPS is an instrument FOR design (→ normative, aiming at pre-rationalization),

- MAPS is based upon assumptions that are results of research ABOUT design (→ descriptive, post-rationalization of existing processes / models),

- MAPS is aiming at the support of research THROUGH design (→ conversational, an interplay of pre- and post-rationalization),

- and MAPS leaves room for the INACCESSIBLE:

This leads to some concluding remarks regarding the above-mentioned dualisms:

- scientific methods vs. designerly methods?

→ the flexible design process structures the use of scientific methods, designerly methods allow the integration of heterogeneous scientific outcomes

- proper research vs. research through design?

→ research through design, conceived as described above, is proper and rigorous design-specific research

- pre-rationalization vs. post-rationalization?

→ both modes are complementary and proceed in a circular relation

- normative methods vs. descriptive methods?

→ both concepts are necessarily complementary in designing

- 1st order methods vs. 2nd order methods?

→ a 2nd order cybernetic view integrates both perspectives and resolves the apparent contradiction

- control vs. conversation

→ the character of the process depends entirely on the observers´ interpretation of the situation, conversation seems to be the more effective approach

- tool vs. medium?

→ the character of the instrument depends on the users´ interpretation of the process, medium seems to be the more productive concept

- research vs. design?

→ essentially, research is a special mode of design, in practice there is a continuous transfer zone between the two, we have to re-discover "the beauty of grey"

- rigourous vs. undisciplined?

→ rigour in the trans-discipline of design is a fairly complex and still barely understood concept; the hypothesis is that in trans-disciplinary endeavours such as design one has to be rigorously undisciplined in order to be relevant

The current work on methodology and design should be considered as a design project in progress. Knowledge FOR and ABOUT design is generated THROUGH design. Thus it supports in a self-referential manner the claims it puts forward. Findeli (2008) takes a slightly different perspective: he says that research THROUGH design (or "project-grounded research" as he prefers to call it), has to combine research FOR and ABOUT design in order to become both relevant and rigorous.

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