MAPS 2.0

Theoretical Underpinnings

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What is MAPS?

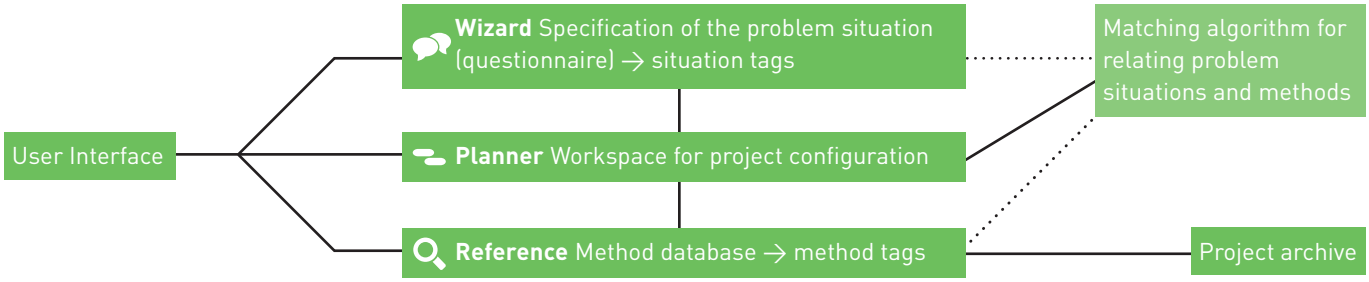
MAPS stands for MATCHING *ANALYSIS – PROJECTION – SYNTHESIS*. MAPS is an intelligent, knowledge-supported online community tool for systematic planning of design research and innovation projects. It decreases complexity and uncertainty in configuring processes and increases efficiency and effectiveness when collaborating with partners and clients.

MAPS is based on a robust theoretical model of the design and development process (see below) and has many Web 2.0 features. It operates in three different modes: *Wizard, Planner* and *Reference* to suit your situational needs.

Wizard guides you step by step to plan a project. With a questionnaire, it assists you to understand the nature of your project and recommends the most suitable process and methods.

Planner supports you to set up, document and communicate a project explicitly.

Reference is a database of over 200 methods, templates and links and a living knowledge bank for you and your institute.



Main components of MAPS 2.0.

Theoretical background

1st element is the learning / knowledge generation / design cycle based on the pragmatist paradigm: Feeling – Watching – Thinking – Doing (KOLB). This is the common basis of numerous 4-step design process models, the most prominent one being that of the Institute of Design Chicago: Research – analysis – synthesis – realization
→ this is what we call the *micro cycle*

2nd element is also based on the learning cycles. Sometimes they are separated into an inductive semi-cycle (research – analysis) and a deductive semi-cycle (synthesis – realization). The connection of the two, in order to introduce the aspect of generating something new, is the abduction step: induction – abduction – deduction.
Numerous three-step design process models fit into this scheme, for example the model of domains of knowing (NELSON & STOLTERMAN): the true – the ideal – the real. In a more designerly notion we speak of ANALYSIS – PROJECTION – SYNTHESIS
→ this is what we call the *macro cycle*

Author	Phases / Macro Steps / Components of Design (Research)		
JONES 1970	Divergence	Transformation	Convergence
ARCHER 1981	Science	Design	Arts
SIMON 1977 / WEICK 1969	Intelligence	Design	Choice
NELSON & STOLTERMAN 2003	The True	The Ideal	The Real
JONAS 2007	Analysis	Projection	Synthesis
FALLMAN 2008	Design Studies	Design Exploration	Design Practice

Triadic concepts / domains of knowing in design research indicating a generic model of the designerly research process

Integration

Macro – and micro cycle can be combined into a hypercyclic model by assuming that each macro step can be considered as a KOLB-type learning cycle of its own. This leads to a 3×4 compartment toolbox, which presents the structural backbone of the generic design and research process model.

The generic model allows for numerous archetypical processes, which correspond to the specific situation at hand. See **Planner** mode.

		Steps of the iterative micro process of learning / designing			
		Feeling	Watching	Thinking	Doing
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			

Structural backbone of the generic design and research process model

1	**A**	**P**	**S**	APS a "complete" design research process	Intelligence and goal driven problem-solving as the driving and leading activities in the design research process with / without Synthesis
2	**A**	**P**		AP a concept / futures studies process (without synthesis/realization)	
3	**A**		**S**	AS a "normal" design process (without proper projection)	
4	**P**	**A**	**S**	PAS a "complete" design innovation process	Design projection as the driving and leading activity in the innovation / exploration / research process with / without Synthesis
5	**P**	**A**		PA an exploration process (without synthesis/realization)	
6	**P**		**S**	PS a "risky", "speculative" trial&error process (without analytical grounding)	
7	**A**			A an analytic research process (inquiry into "the true")	disciplinary, domain-specific research or practice
8		**P**		P a projective futures studies process (inquiry into "the ideal")	
9			**S**	S a synthetic realization process (inquiry into "the real")	

Nine archetypical design and design research processes.

Knowledge-supported configuration

The Wizard mode of MAPS aims at the knowledge-based support of the configuration of design and research processes. For that purpose it contains an algorithm, which matches the specific design / research situation and the available methods.

MAPS uses tags to relate the situation and the suitable methods. By answering the questions in the **Wizard** questionnaire the user selects tags that characterize the project. At the same time the tags are instruments for method profiling, that means characterizing their usability / usefulness for specific purposes. The method tags are assigned when a method is defined in the Reference mode.

The set of tags is shared by the questionnaire (problem side) and the methods (solution side). Tags belong to both sides, they are the connecting elements. That means for example: a problem situation can be designerly / scientific and a method can be designerly / scientific, etc. For more detailed information about the tagging rationale refer to the appendix.

Matching the profiles of the situation and of the methods available contributes to the knowledge-supported selection of methods and tools for specific project situations (pre-rationalization): it is essential for the establishment of MAPS as an "intelligent" tool.

References

HUGENTOBLER, HANS KASPAR; JONAS, WOLFGANG; RAHE, DETLEF (2004) "Designing a Methods Platform for Design and Design Research", in: *futureground, DRS International Conference,* Melbourne, Nov. 2004

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Appendix

The following table illustrates the tagging rationale:

Questionnaire

Question	Answers	Tags	Actions (Wizard)
1 PROJECT CHARACTER openness / determination			
1 Do you aim to improve an existing product and/or service?	Yes	These terms do not make sense as tags for the methods	it is necessary to know the situation / context in advance → take the **APS** sequence
2 Do you aim to explore a new product and/or service?	Yes		concrete future options / concepts are needed first in order to analyse them in context (create the situation) → take the **PAS** sequence
2 SYSTEM DIMENSION complexity			
3 Does your project require different disciplines, professionals and/or domains of knowledge?	Yes, because of its inherent trans-disciplinarity which requires a systemic support	*trans-disciplinary*	→ select the appropriate methods for systemic modelling / analysis (SM-tools, consideo, ithink, ...)
4 Must you consider more than one of the factors: technological, social, economical, political and human?	Yes, because of the hybrid complex character of the design project (human and non-human actors, hard and soft facts, etc.) involved	*systemic, complex, system modeling*	
5 Is the aim of your project clearly defined?	No, because of the fuzzy boundaries between the arte-fact to be designed and its contexts (form – medium)	*fuzzy*	
6 Can your project be easily broken down into tasks and sub-tasks?	Yes, because of the (near) decom-posability of the design project	*non-systemic, reductionist*	→ ignore the systemic character of the project

Question	Answers	Tags	Actions (Wizard)
3 PROJECT DIMENSIONS			
A context (research) and setting			
7 Do you need scientific knowledge for your project?	Yes, this is the primary aim	*scientific, determined, analytical, descriptive*	→ select the appropriate **A** methods for research / inquiry
	Yes, it is essential for the problem setting	*designerly, open, creative, projective*	
	No, because we know it already	—	→ ignore **A**
	No, it is irrelevant	—	→ ignore **A**
8 Does your project take place in the contrived setting, such as the laboratory?	Yes	*laboratory*	→ select the appropriate methods
9 Does your project take place in natural setting, such as user's home, or the streets?	Yes	*field*	
P Future			
10 Do you want to generate a variety of new products or services?	Yes	*variety-generating*	→ select the appropriate **P** methods for inquiry / exploration / variety generation
11 Do you want to anticipate the future by building scenarios?	Yes, we need scenarios as learning instruments for dealing with future uncertainties	*exploring, scenario-building*	
12 Do you want to predict or forecast future trends with precision?	Yes, we want to predict future states	*forecasting, predicting*	
13 Is it important to explore the uncertain future states?	No, the future will be an extrapolation of the present	—	→ ignore **P**

Question	Answers	Tags	Actions (Wizard)
S Implementation			
14 Do you want a marketable product with little risk?	Yes	*realistic, product*	
15 Do you want a working prototype?	Yes	*prototype*	→ select the appropriate **S** methods for evaluation / realization
16 Do you want a feasibility study?	Yes	*feasible*	
17 Do you want just concepts or ideas?	Yes	*conceptual*	→ ignore **S**
4 PROJECT DOMAIN			
18 In which domain(s) is your project situated or oriented?	Technology	*technology*	
	Business	*business*	
	Design	*design*	→ select the appropriate methods
	People Physical aspect Cognitive aspect Social aspect Cultural aspect	*people (physical, cognitive, social, cultural)*	
5 PROJECT CONSTRAINTS			
19 How is your project scheduled?	Tight	*quick, few steps*	
	Open	*long-duration, time-consuming, many steps*	→ select the appropriate methods
20 How is your budget?	Tight	*economical*	
	Sufficient	*costly, expensive*	
21 Does your project require external parterns or external experts?	Yes	*difficult to learn, special skills required, team-work required, trans-disciplinary*	→ select the appropriate methods
	No	*easy to learn*	

Question	Answers	Tags	Actions (Wizard)
6 DATA / INFORMATION / KNOWLEDGE TYPES GENERATED IN THE PROJECT			
22 What forms of data or information does your project need?	primary secondary descriptive explanatory normative quantitative qualitative generalisable transferable theoretical factual hand drawing photography video CAD text prototype MS-compatible	*primary* *secondary* *descriptive* *explanatory* *normative* *quantitative* *qualitative* *generalisable* *transferable* *theoretical* *factual* *hand drawing* *photography* *video* *CAD* *text* *prototype* *MS-compatible* …	→ select the appropriate methods
7 USER-GENERATED INFORMATION REGARDING THE PROJECT			
	Additional user-generated descriptions of the project	*Additional user-generated tags that characterize the project*	

Methods Form

Method description	
Name: —	
Toolbox compartment: *one or more or all of the 12 compartments*	
Purpose: —	
Description: —	
References and links: —	
Method tags	
1 PROJECT CHARACTER does not make sense here.	
2 SYSTEM DIMENSION tags · *trans-disciplinary* · *systemic, complex, system modelling* · *fuzzy* · *non-systemic, reductionist*	**Method:** · supports trans-disciplinary work · allows system modelling of the situation · works with fuzzy, qualitative data · is not at all systemic, but reductionist
3 PROJECT DIMENSION tags **A** · *scientific, determined, analytical, descriptive* · *designerly, open, creative, projective* · *laboratory* · *field* **P** · *variety-generating* · *exploring, scenario-building* · *forecasting, predicting* **S** · *realistic, product* · *prototype* · *feasible* · *conceptual*	**Method:** · makes sense for more scientific or · for more designerly projects **Method is usable:** · for laboratory or · for field work. **Method:** · generates variety, alternatives · explores future situations · tries to make exact predictions **Method:** · aims at a realistic product as an outcome · produces prototypes (rapid prototyping) · demonstrates feasibility · delivers just concepts
4 PROJECT DOMAIN tags · *technology* · *business* · *design* · *people (physical, cognitive, social, cultural)*	**Method:** · relates to technology issues · relates to business issues · relates to design issues · relates to people's needs and wants and wishes

5 PROJECT CONSTRAINT tags · *quick, few steps* · *long-duration, time-consuming, many steps* · *economical* · *costly, expensive* · *easy to learn* · *difficult to learn, special skills required* · *team-work required, trans-disciplinary*	**Method:** · is not time-consuming · requires considerable time · does not cost much · is expensive, for example because it requires costly software · is easy to apply, no special expertise required · needs learning and experience, requires special skills · requires work in (trans-disciplinary) teams
6 DATA TYPE tags · *primary* · *secondary* · *descriptive* · *explanatory* · *normative* · *quantitative* · *qualitative* · *generalisable* · *transferable* · *theoretical* · *factual* · *hand drawing* · *photography* · *video* · *CAD* · *text* · *prototype* · *MS-compatible* · …	Method generates data / information / knowledge of the respective type or character, no explanation required.
7 USER-GENERATED tags · …	Users can tag the methods according to their personal experience: *complicated, inefficient, funny, …*