Modelling knowledge claims of design methods and their steps, and benchmarking these claims

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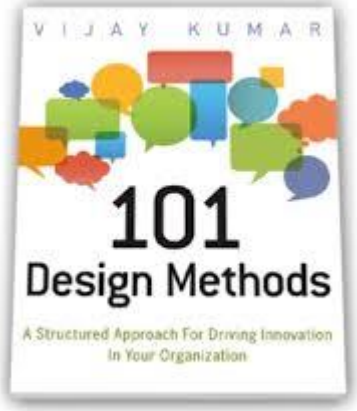
The challenge



Current design methodology

- there are multiple design methods and tools on the market
- their effectiviness is shown by successful applications
- designers choose among the options by their experience

Future design methodology?

- validation of the effectiveness of methods and tools
- comparison of methods and tools by efficiency
- creating knowledge for choosing among the options

Plan – work in progress

1. Set up a framework for considering efficiency using work by Joan van Aken
2. Sketch work on creating a basis for comparing methods and tools by efficiency

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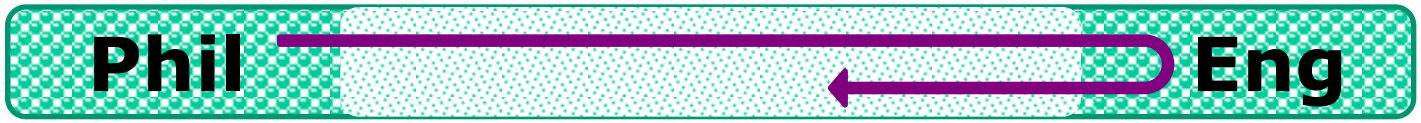

- no gentlemen agnosticism from engineering research
- but still somewhat abstract

Step 1: articulation of the knowledge claims

Joan van Aken: algorithmic claims about particular cases:

For a particular design, method, aim, context, et cetera

- design D realizes aim A in context C
- method M enables finding a design D that realizes A in C, by designers with expertise E

- D realizes A in C
- M enables finding D-realizes-A-in-C by designers with E

Step 1: articulation of the knowledge claims

Joan van Aken: algorithmic claims about particular cases:

For a particular design, method, aim, context, et cetera

- D realizes A in C
- M enables finding D-realizes-A-in-C by designers with E

Step 1: articulation of the knowledge claims

Joan van Aken: heuristic claims about generic cases:

For all designs, methods, aims, et cetera

- D_1 realizes A_1 in C_1
- D_2 realizes A_2 in C_2
- D_3 realizes A_3 in C_3 …
- M_5 enables finding D_5-real.-A_5-in-C_5 by designers with E_5
- M_6 enables finding D_6-real.-A_6-in-C_6 by designers with E_6 …

- {D realizes A in C}
- {M enables finding D-real.-A-in-C by designers with E}

Knowledge claims about effectiveness

Heuristic claims for all designs, methods, aims, et cetera

- {D realizes A in C}
- {M enables finding D-realizes-A-in-C by designers with E}

Claims about effectiveness of a particular D and M

- D realizes A in C_1, and also D realizes A in C_2, C_3, …
- D realizes A_1 in C, and also D realizes A_2, A_3, … in C

- M enables finding {D-real.-A-in-C} by designers with E

Knowledge claims about efficiency

- {D realizes A in C}
- {M enables finding D-realizes-A-in-C by designers with E}

Claims about efficiency of a particular D and M

- D_1 realizes A in C,
  but also
  D_2 realizes A in C, et cetera

- M_1 enables finding {D-real.-A-in-C} by designers with E
  but also
  M_2 enables finding {D-real.-A-in-C} by designers with E
  et cetera

Knowledge claims about method efficiency

M_1 enables finding {D-real.-A-in-C} by designers with E

but also

M_2 enables finding {D-real.-A-in-C} by designers with E

et cetera

By introducing additional norms (time, effort, recourses, …) one can then benchmark methods in both senses:

- determine which is most efficient
- use one method for improving the other

But is this feasible in design research?

M_1 enables finding {D-real.-A-in-C} by designers with E

but also

M_2 enables finding {D-real.-A-in-C} by designers with E

et cetera

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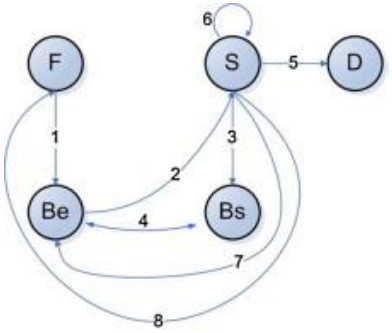
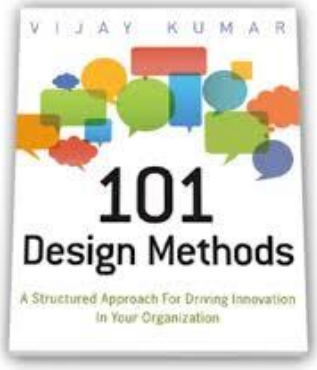
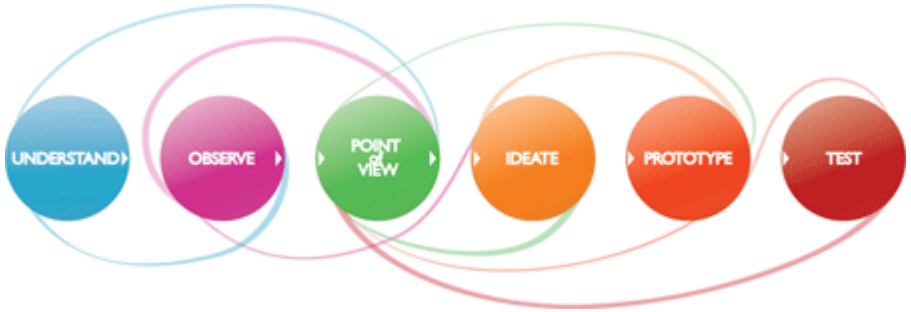
A first phase

Fix the generic knowledge claims of steps in design methods







Frame Creation *steps*:

- **Archaeology**
- **Paradox**
- **Context**
- **Field**
- **Themes**
- **Frames**
- **Futures**
- **Transformation**
- **Integration**

A first phase

Fix the generic knowledge claims of steps in design methods

Step	Aims	Means	Criteria
Archaeology	**An understanding of the past history of the problem situation**	**Invite presentations on the problem situation by experts – analyse the role of the problem owner, past attempts to solve it, and what could have happened if another path was taken**	**Archaeology should capture: - Tensions or competing interests and values - Flexible and non-negotiable boundaries that can limit solutions**
Paradox	**An identification of the two most competing needs that cannot exist together**	**Think of tensions and opposing forces that make the problem hard to solve**	**Paradox should capture opposing needs that prevent the problem owner from moving forward**
Context	**A description of the stakeholders who have been involved with the problem situation and/or will be involved in its solution**	**Discuss current strategies and values and needs of stakeholders**	**Context should: - Contain powerful or controversial stakeholders - Identify significant influences on their behaviour**
…	**…**	**…**	**…**

Knowledge claims about method steps

S_1 enables finding X by designers with E

but also

S_2 enables finding X by designers with E

et cetera

By introducing additional norms one can benchmark method steps and design tools in both senses:

- determine which is most efficient
- use one for improving the other