Designing the Designer

educating system/software architects

Kees van Overveld

TU/e (SAI); Philips Research

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Design and Research

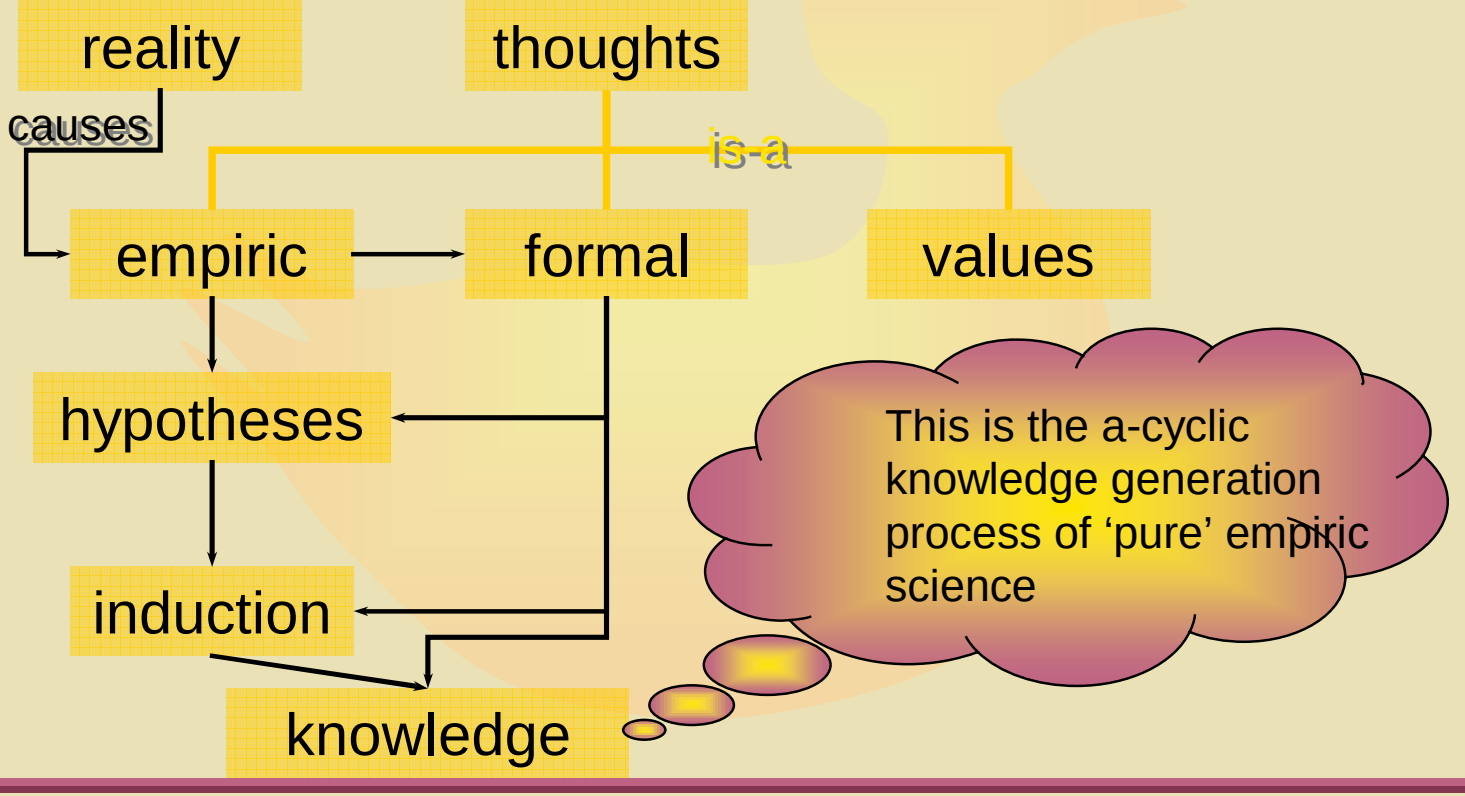
	researcher	designer
Type of questions:	why?	What-if?
Starts from:	empiric findings	set of requirements
Asked:	theory (explanation)	artefact
Searches for:	single possible **truth**	one of many possible **realities**
Thinking terms:	**in**variants	variants
Thinking steps:	logic ←→truths	inspiration ←→relevance
Role of a model:	isolation (leave out a.m.a.p.)	integration (take into account a.m.a.p.)
Aim:	production of knowledge	solve social problems
Progress:	discovery	decision
Role model:	Einstein	Edison
Mutual relation:	application=black box	underlying law=black box
Methodology	extension → insight	intention → extension

Methodology, Culture and Tradition of Research

(Technical, higher) education = driven by scientific research

Scientific research = the production of true knowledge

Knowledge = the perception of (one's own) thoughts



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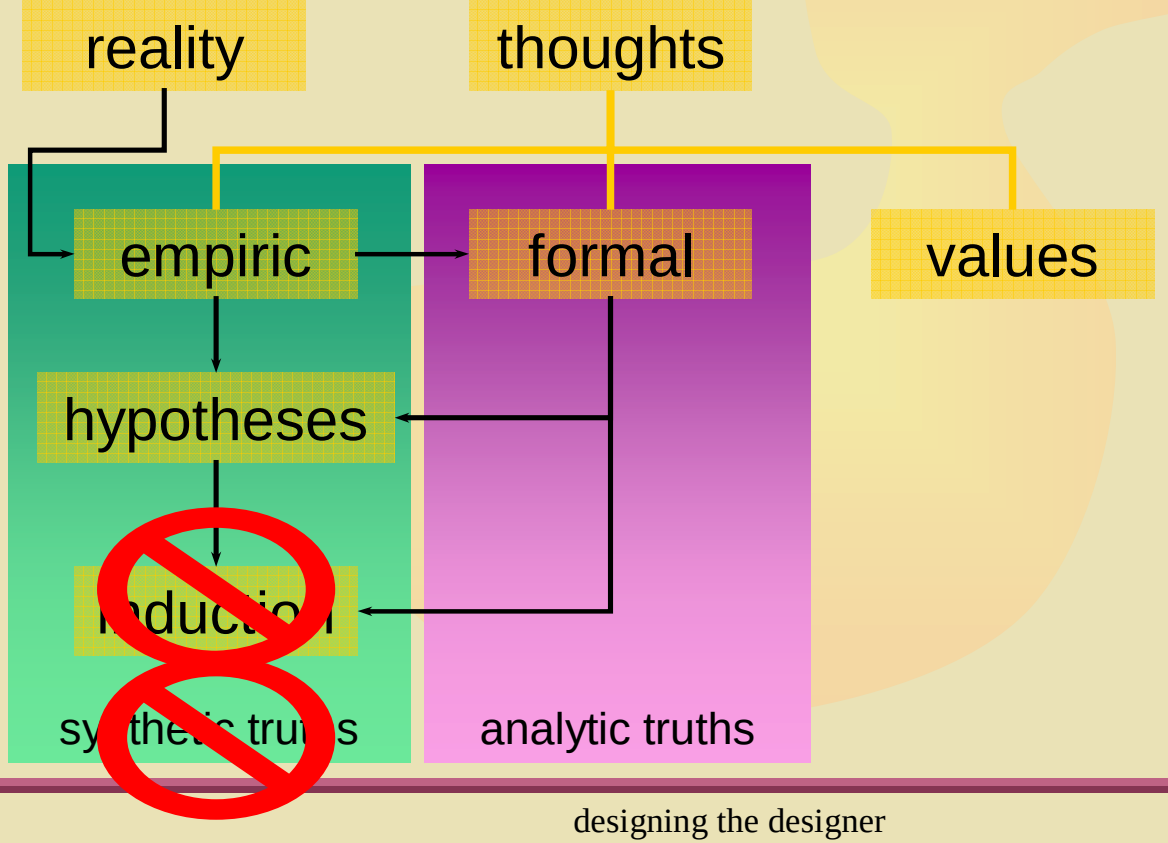

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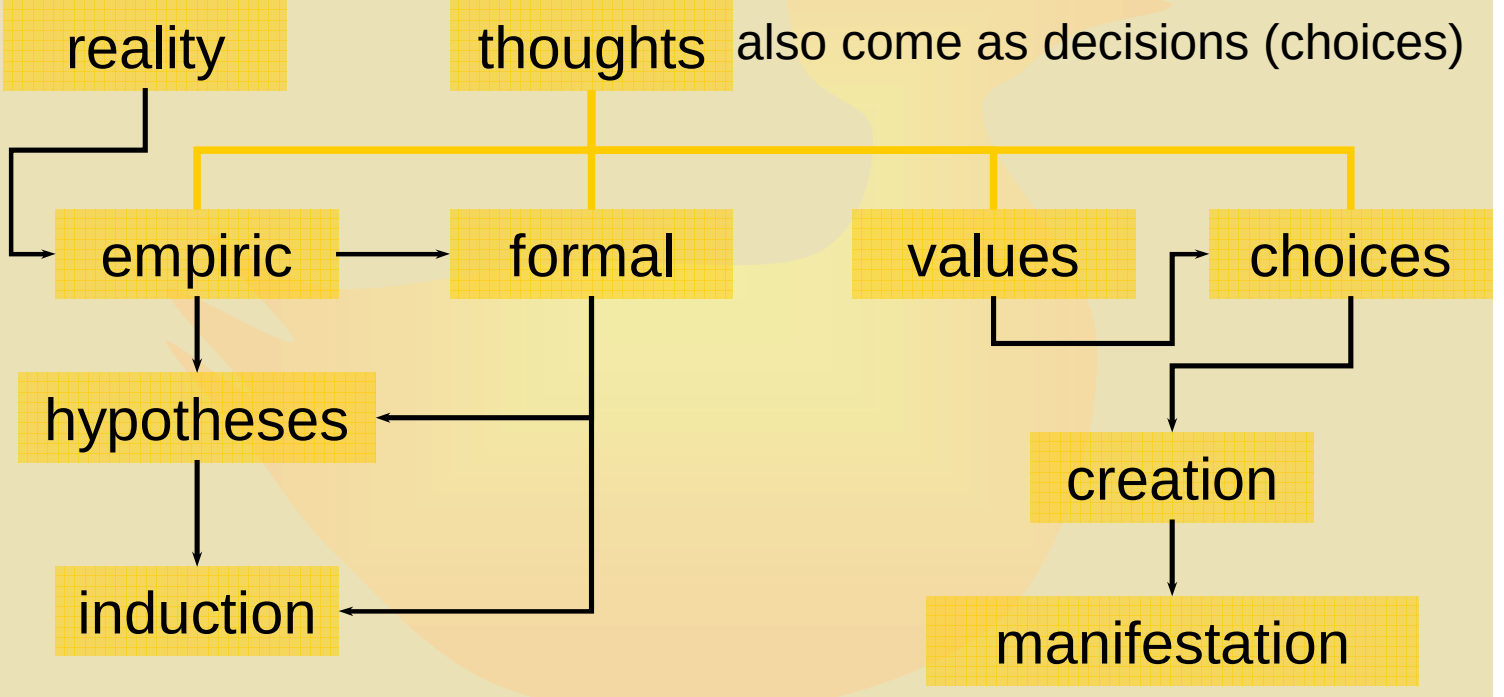

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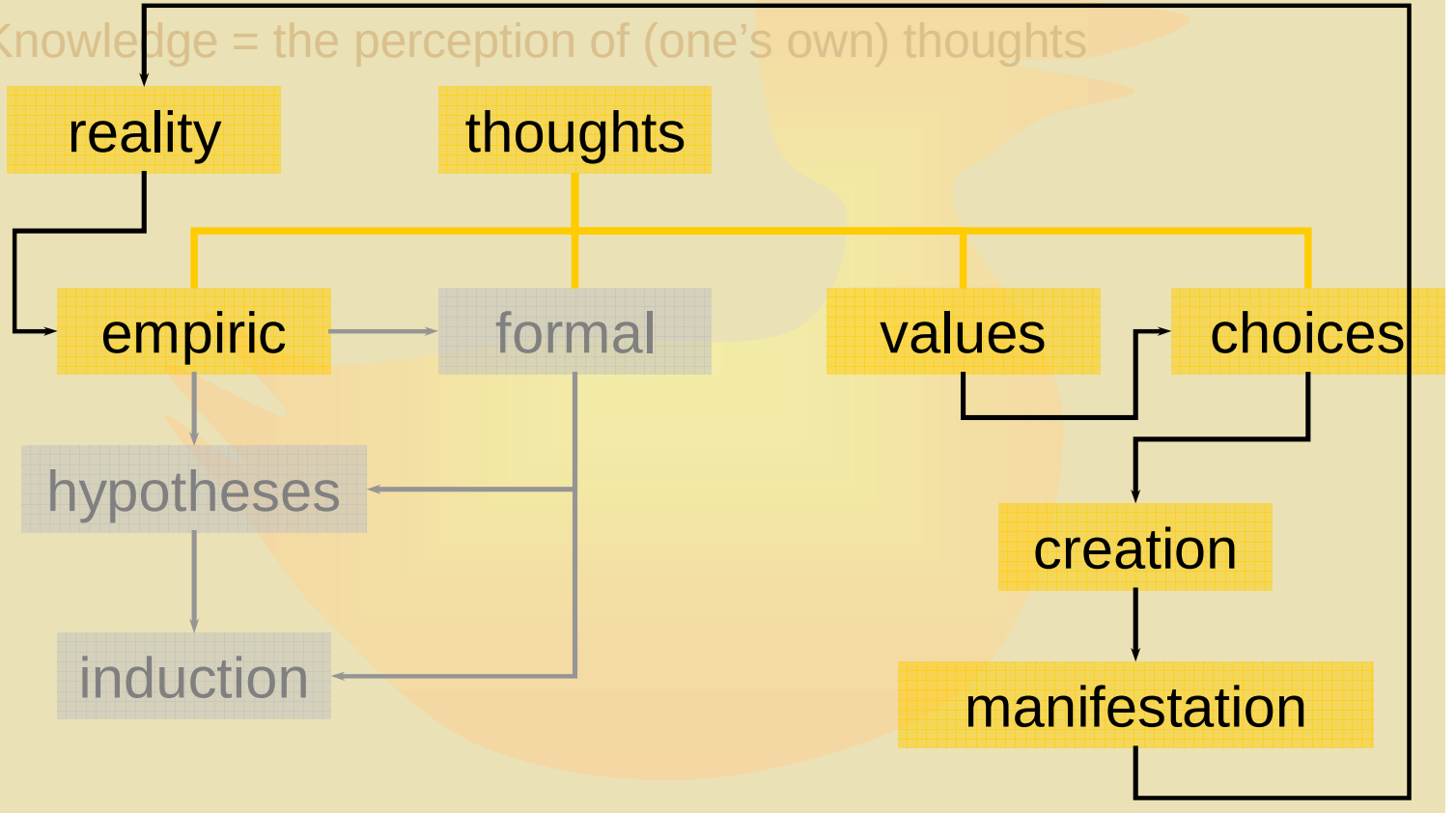

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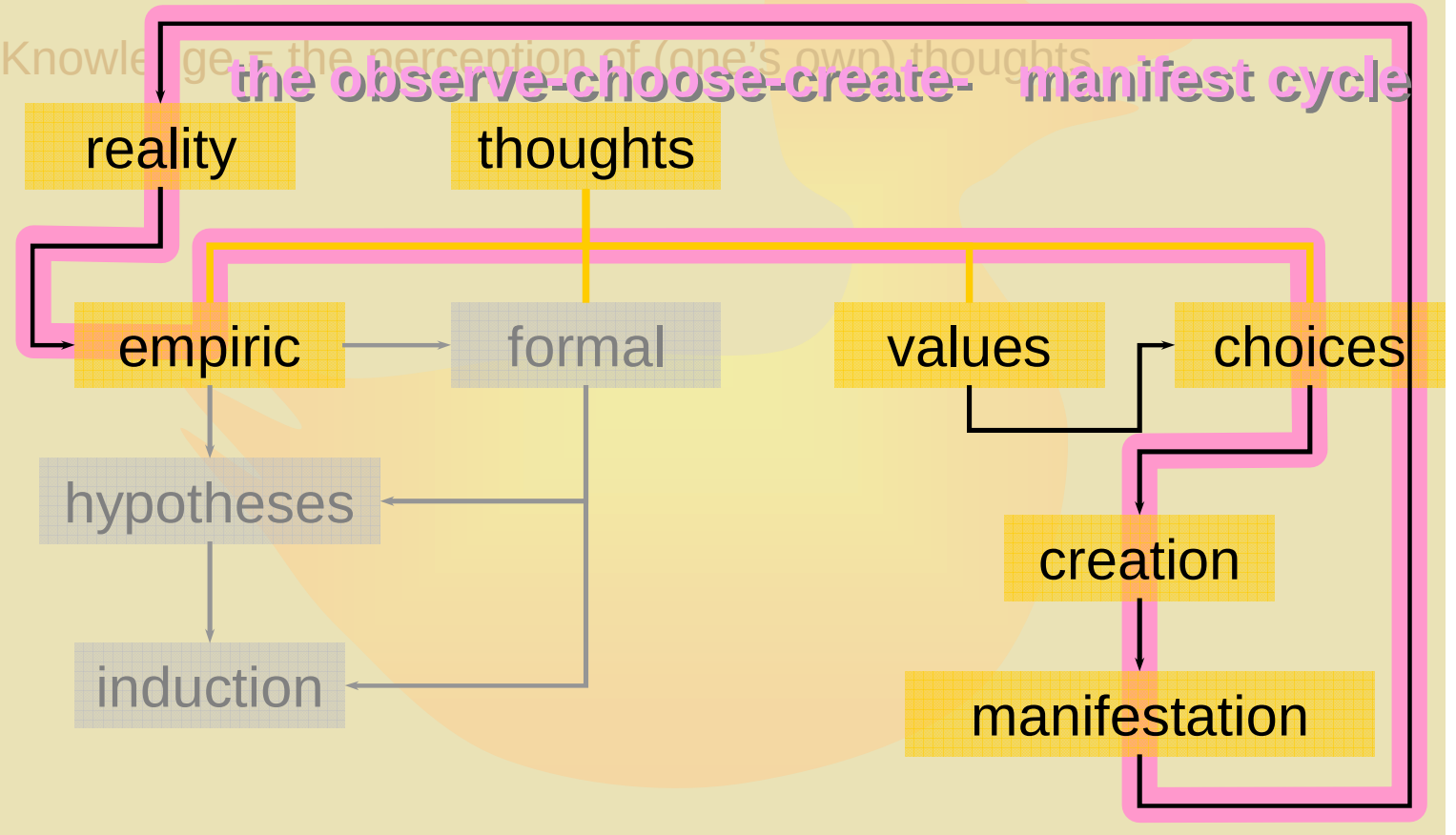

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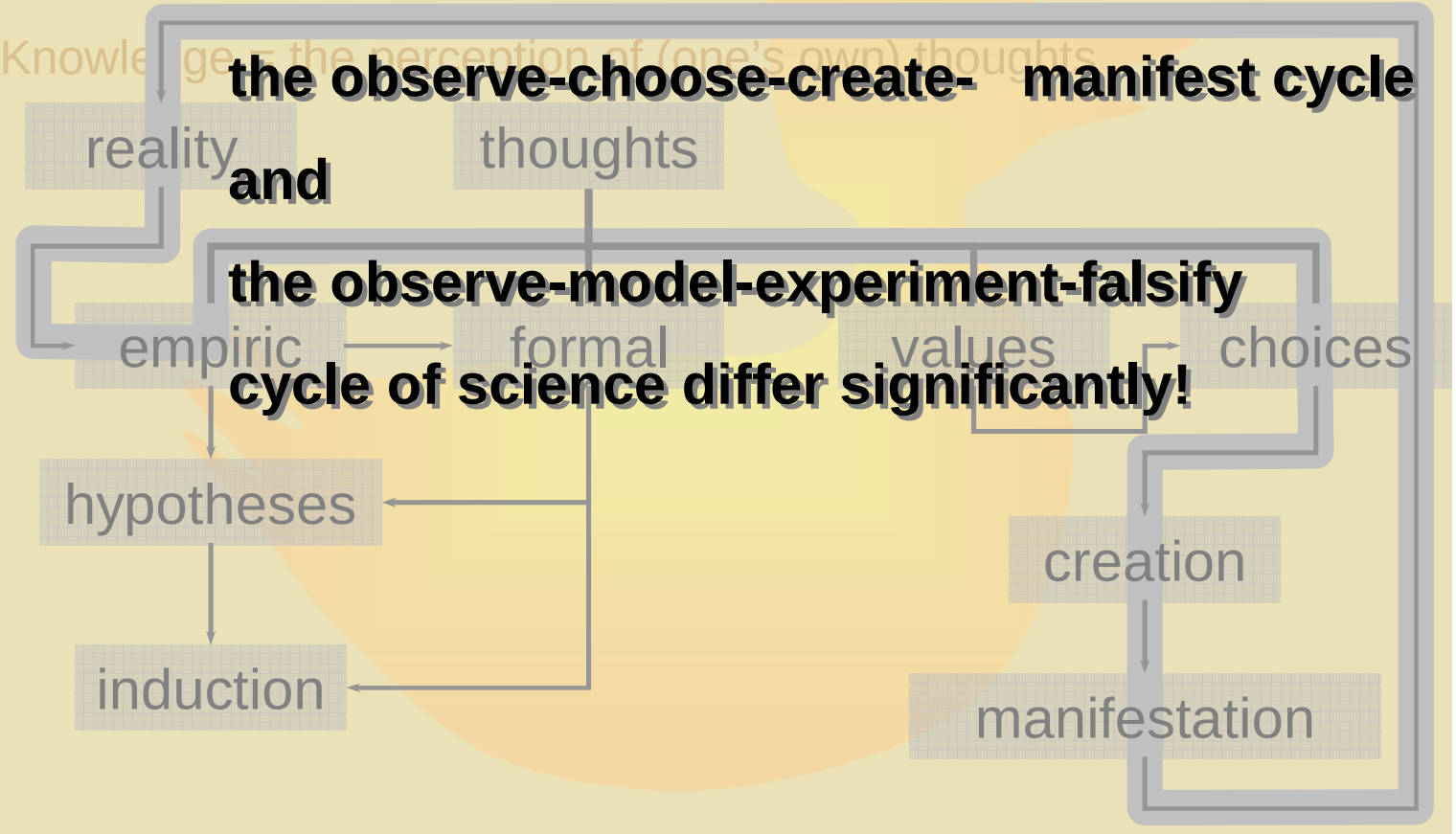


the observe-choose-create- manifest cycle

and

the observe-model-experiment-falsify

cycle of science differ significantly!

Methodology, Culture and Tradition of Research

(Technical, higher) education = driven by scientific research

Scientific research = the production of true knowledge

Knowledge = the observe-choose-create-manifest cycle

and

the observe-model-experiment-falsify

cycle of science differ significantly!

because:

- different intention
- designed artefact ≠ experimental set up
- no reproduction under controlled circumstances
- no systematic variation of 1 variable at a time

Methodology, Culture and Tradition of Research

preliminary conclusion:

- university system is based on empiric and formal forms of thinking
- this gives rise to academic practice incl. experimental falsification
- ‘value’ and ‘choice’-thinking forms fall outside this regime
- therefore, universitary education may be inadequate for designers

The educational system at universities

We analyse unversity culture on the dimensions of

- objectivity
- profoundness
- academic professionality
- involvement

using the method of kernel quadrants

The educational system at universities

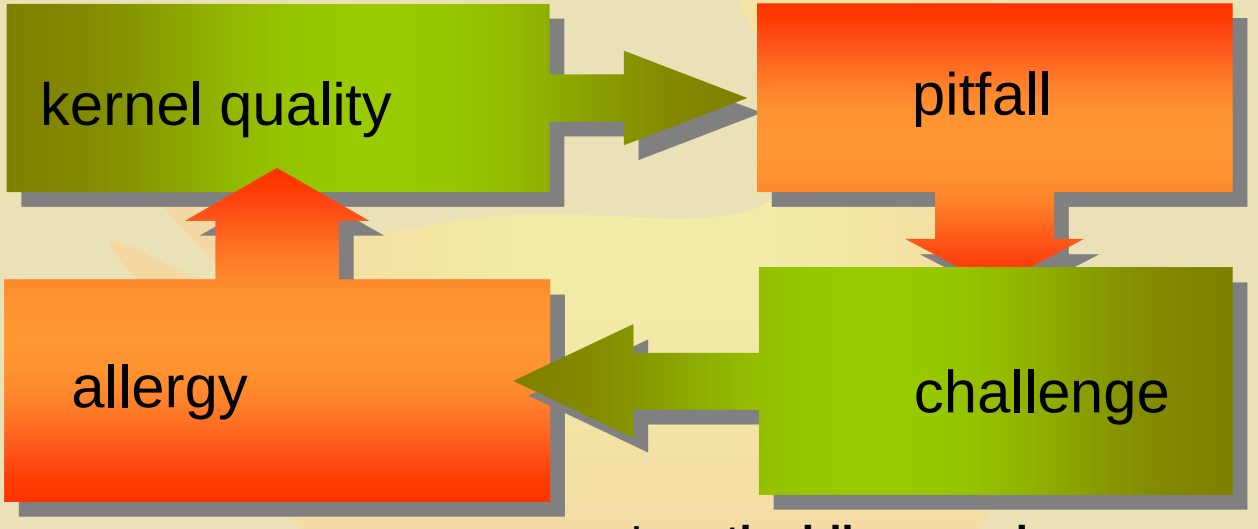
* part of one's intrinsic attributes

*strongest point

*characteristic quality

*result of exaggerating

*one's strongest weaker spot



*what you dislike in others

*exaggerated challenge

*worthwhile pursuing

*the positive inverse of the pitfall

The educational system at universities

We analyse unversity culture on the dimensions of

- objectivity
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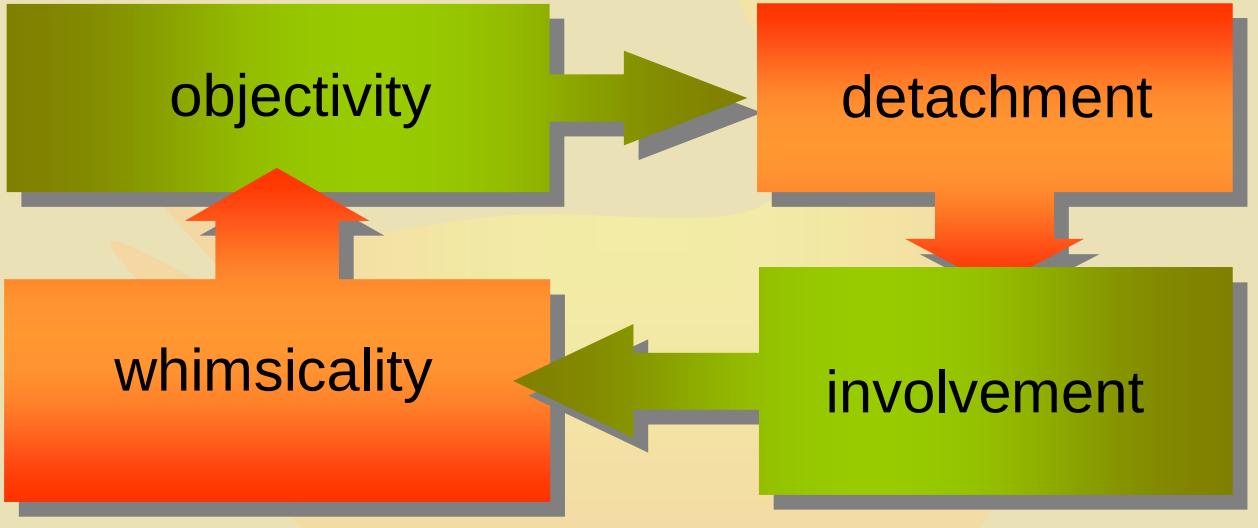
- involvement

The educational system at universities

*carrier of culture

*gauge for scientific standards

*inert, self-sufficient
*ivory tower
*'academic' in negative sense



*dispersed
*stylish
*opportunistic
*lack of identity

*contract research
*staff sharing
*'wetenschapswinkels'

The educational system at universities

We analyse unversity culture on the dimensions of

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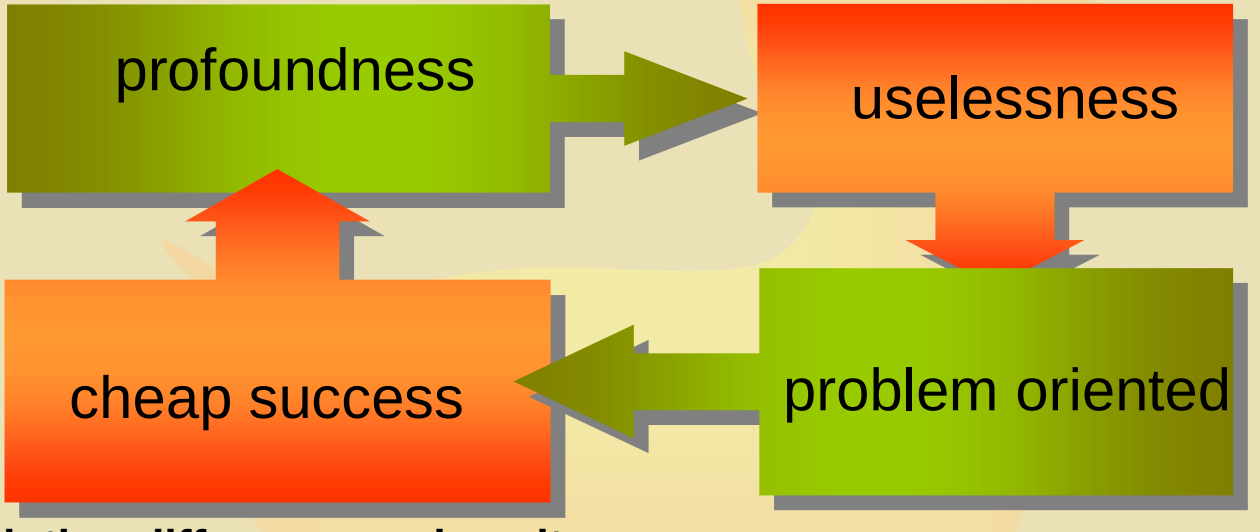
The educational system at universities

*distinction and identity
*long term thinking
*continuity

*risk of hobby-horses
*no attention for difficult but relevant problems



*fainting difference: university ↔ research institutes
*criteria for quality get diffuse
* continuity gets problematic

*co-ordination and trans-disciplinary collaboration gain importance
*much overhead

The educational system at universities

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The educational system at universities

*know-how (=prestige)

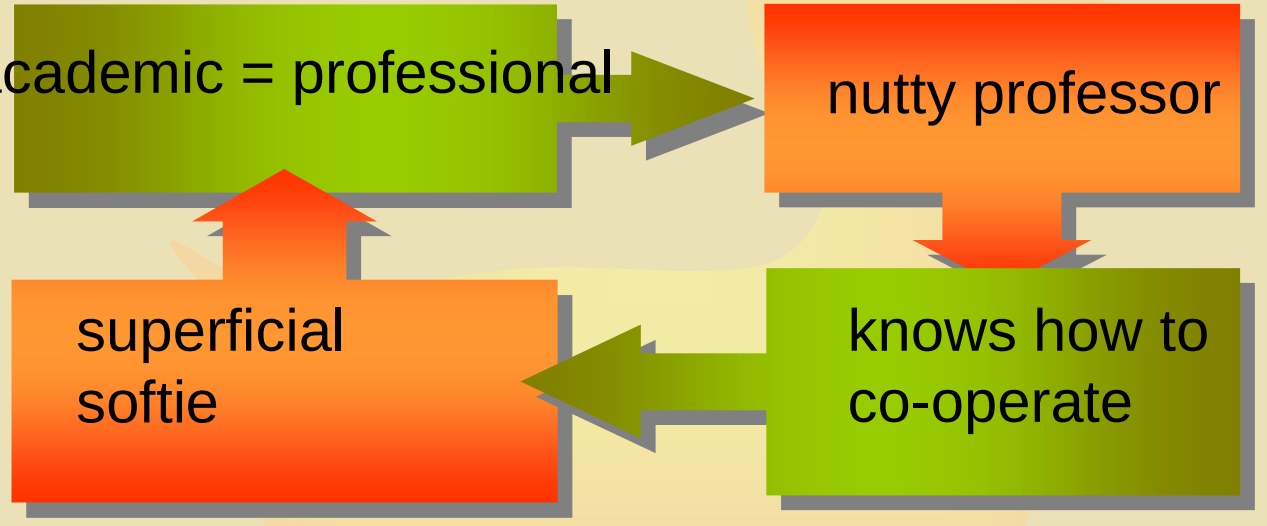
*indispensable as expert

*required for complex tasks

*knows everything about nothing & v.v.

*lacks context sensibility

*knowledge push ↔ of problem pull



*trashing (burden of overhead)

*insufficient authority

*intra- and inter disciplinary

*identify lacking knowledge

*information-on-demand

The educational system at universities

We analyse unversity culture on the dimensions of

- objectivity
- profoundness
- academic professionality
- involvement

The educational system at universities

*contract research

*'wetenschapswinkels'

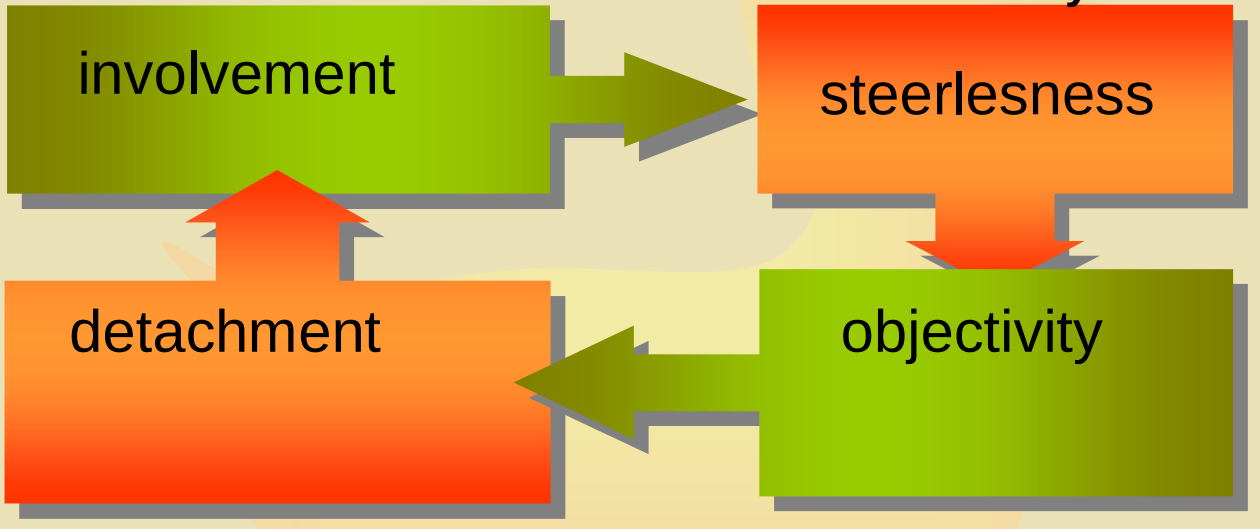
*3rd flow money& 0.0 appointments

*dispersed

*trendy

*opportunistic

*lack of identity



*inert, self-satisfied

*ivory tower

*'academic' in negative sense

*culture carrier

*gauge for scientific quality

The educational system at universities

We analysed unversity culture on the dimensions of

- objectivity: necessary but not sufficient
- profoundness: reality is often too complex
- academic professionality: different criteria apply in the outside world
- involvement: too much involvement may conflict with university's core values

A conflict

Designing falls outside the university's core values for

- historical reasons
- methodological reasons
- reasons of quality assessment
- cultural reasons

Innovative technologic design requires a level of technologic sophistication that is only found in university

An even bigger conflict: the case of software

software design is particularly nasty, because:

- possible to fake design
- abstraction paradox
- non-linear relation between design decision and consequence
- non-testability
- high pace of innovation
- large contextual impact

(only comparable with bio-technological design)

Standard solutions and why they don’t work

1. the university should change its basic attitude:

- it can’t
- it won’t
- it shouldn’t
- it would take too long
- it escapes control

Standard solutions and why they don’t work

2. we need a new type of university focuses on design:

- no operational quality criteria available that substitute for ‘scientific-ness’
- can’t avoid competition with regular universities

Standard solutions and why they don't work

3. curriculum in existing university should adjust as cf. Gerrit Muller c.a.: more attention for contextual issues of design
    - more context issues means less room for technical topics
    - trend conflict:
        - technology gets *increasingly* difficult
        - (prospect) students don't get smarter
        - spend *less* time in technology topics?
    - existential discussions within university (see Meijer-Meijers discussion)
    - would students be motivated?

Weird ideas

analogy:

in late 1970-ies:

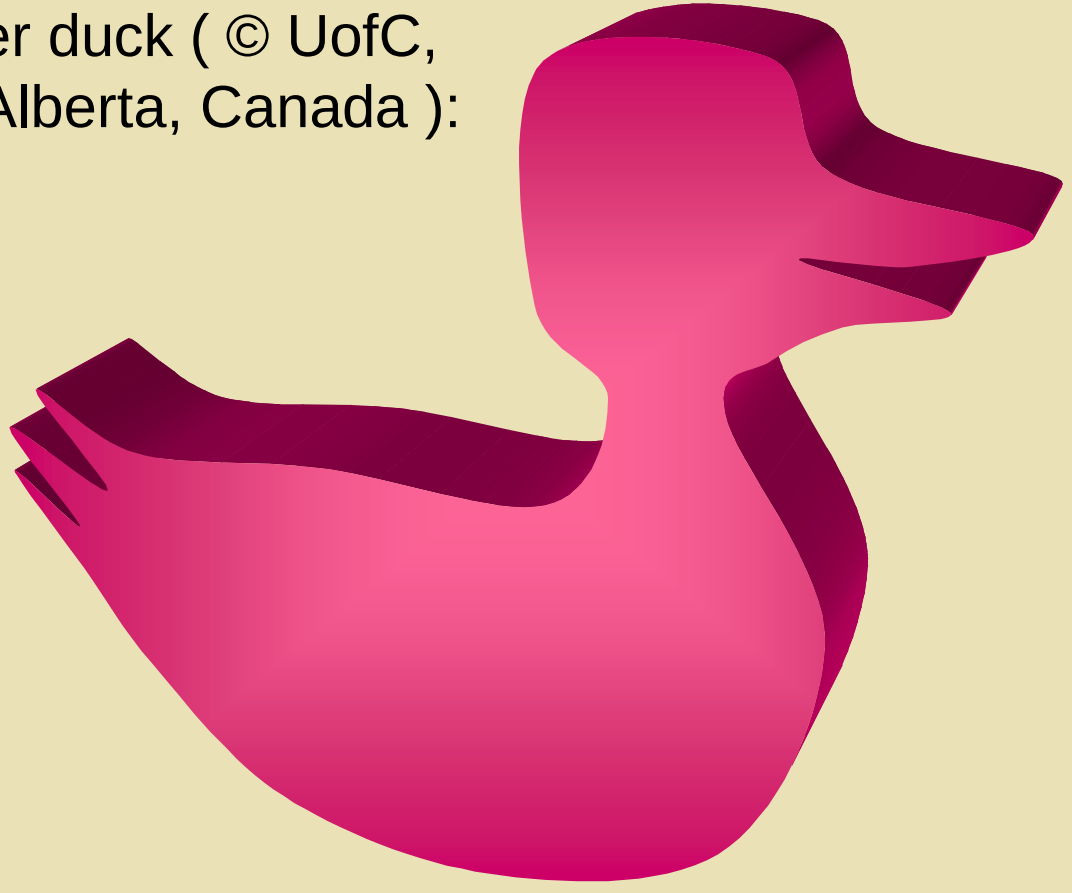
- advent of process-thinking
- new actors (project manager, process controller)

in early 2000-ies:

- advent of design-thinking
- new actors (rubber duck, devil's advocate)

Weird idea nr. 1

The rubber duck (© UofC, Calgary, Alberta, Canada):



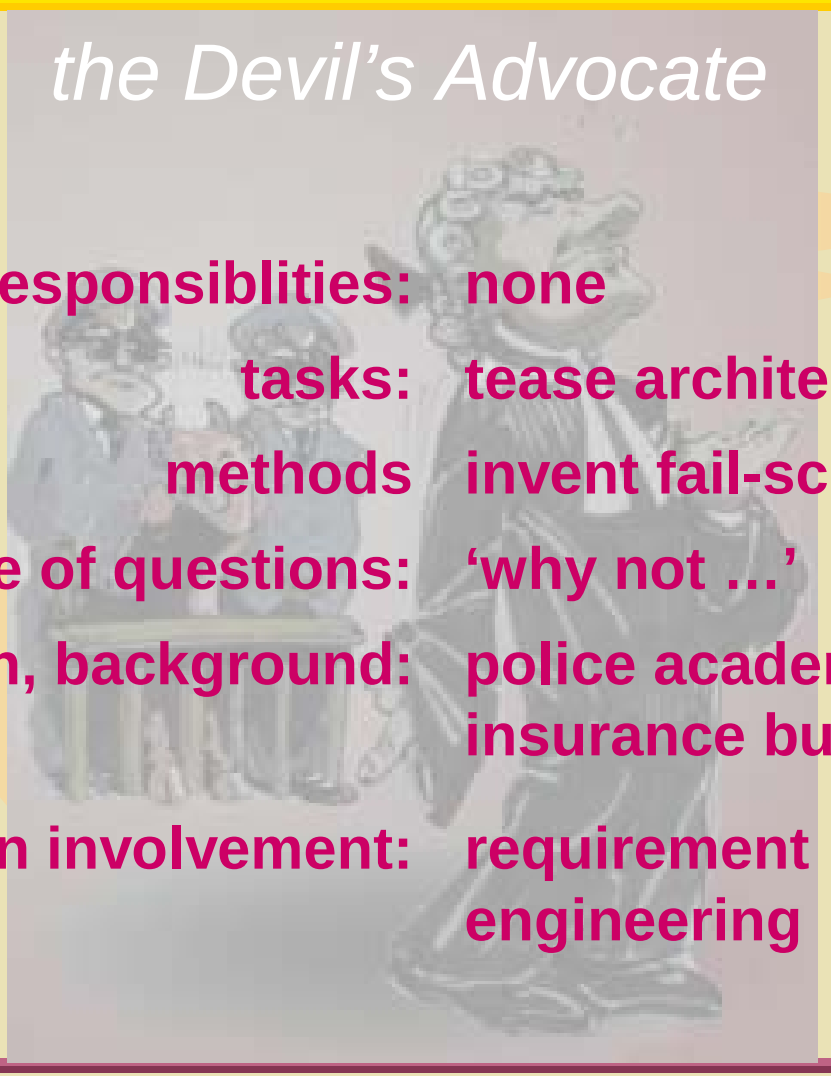
Weird idea nr. 1

formal responsiblities:	identify rationale for ‘every’ decision;
	make designers suggest alternatives
tasks:	slow down project team members
methods	systematic stupidity
type of questions:	‘why’ and ‘how else’
education, background:	philosophy
main involvement:	structure design & detailing

Weird idea nr. 2

Weird idea nr. 2

the Devil's Advocate



formal responsiblities:	**none**
tasks:	**tease architect**
methods	**invent fail-scenarios**
type of questions:	**'why not …'**
education, background:	**police academy, insurance business**
main involvement:	**requirement engineering**

Conclusions

1. designing is fundamentally different from research
2. universities originate from te research paradigm
3. advanced knowledge is an essential ingredient in design, so universities should continue to do what they are good at
4. too much & too soon focusing on design in technical education can dilute technical contents:
   - won't happen
   - shouldn't happen
5. in stead, define new process-related roles in design teams (cf. project mgmt in 80-ies)