



Using Theoretical Ideas to Stimulate Creativity and Participation in Design

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Outline

- Illustrative example
 - Furniture design
- Goal and working hypothesis
- Conceptual framework for analysis and design
- Two inspirational ideas
 - Reflection-in-action; Generalized Other
- Software realization
 - Janus; FLE-Assistant
- Open issues and summary
- Comparison to themes discussed at the workshop

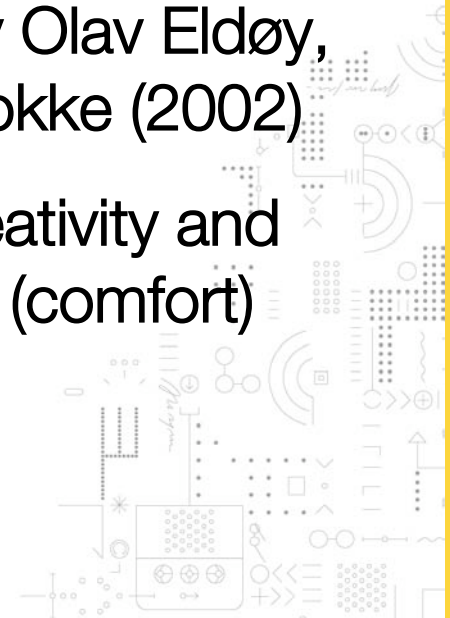




Illustrative example



- Design inspired by orange peels falling to the ground
- “Peel chair” by Olav Eldøy, produced by Stokke (2002)
- Combining creativity and utilitarian design (comfort)





Goal and working hypothesis

- Goal
 - Inspirations that originate outside design fields are used to ground the unfamiliar (artifact) in something familiar (nature, context, previously designed artifacts, etc.)
 - Incorporating inspirations as features (usable or non usable) in the artifact during construction, so that the inspirations can be *communicated* to end users via product
- Working hypothesis
 - In a similar manner, *theoretical ideas* might serve as inspiration for designers of software applications
 - Exploiting similarities and differences of physical artifacts (furniture) and computational artifacts (applications)



Conceptual frameworks

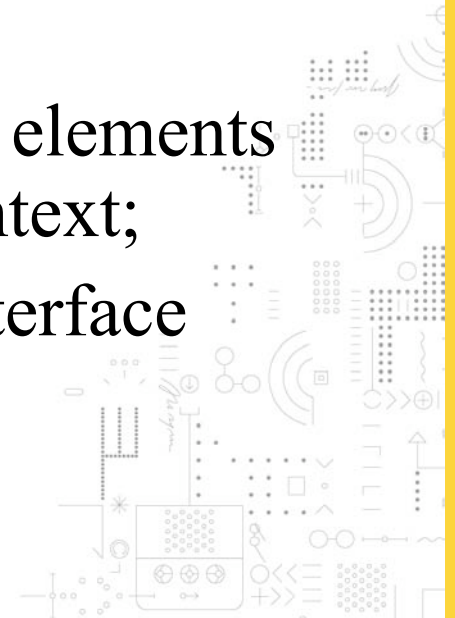
- A social-cultural approach to retrospective *analysis* in order to study the developmental trajectory of artifacts
 - Extrinsic motivation
 - Appropriation (Wertsch)
 - Externalization (Vygotsky)
- A corresponding transformational approach to theory-informed *design* of applications to guide designers
 - Selection
 - Appropriation
 - Translation





Transformational approach to design

- *Selecting* a theoretical idea from a field of research one wishes to explore, understand and communicate, stimulated by extrinsic motivation for accomplishing it;
- *Appropriating* the idea so that its basic elements stand out in a contemporary design context;
- *Translating* the elements into a user interface design as an act of externalization .





Two inspirational ideas communicated by concrete designs

- Originating in American Pragmatist tradition
 - Pierce, James, Dewey, Mead, Schön,
- Two ideas I have been working with for long time
 - *Reflection-in-action*
 - D.A. Schön
 - *Generalized Other*
 - G.H. Mead





Software realization

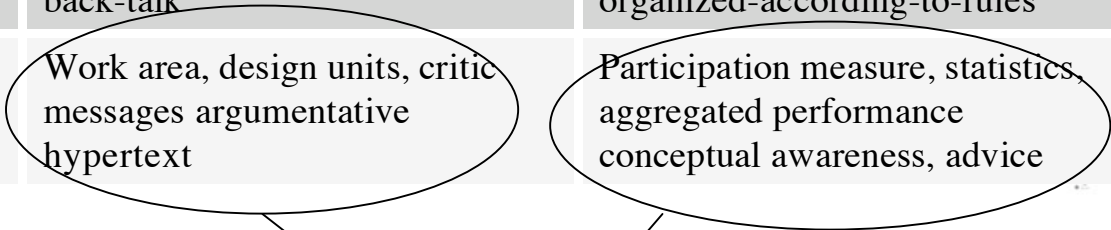
- Janus
- FLE Assistant





Transformation map

Sub-processes	Janus	FLE-Assistant
Selection (<i>theoretical idea</i>)	Reflection-in-action (D.A. Schön)	'Generalized other' (G.H. Mead)
Appropriation (<i>break up</i>)	Action, reflection, action-present, back-talk	Game, roles, rules, roles-organized-according-to-rules
Translation (<i>GUI components</i>)	Work area, design units, critic messages argumentative hypertext	Participation measure, statistics, aggregated performance conceptual awareness, advice



User interface





Janus-Argumentation

Answer (Refrigerator, Sink, Stove)
The distance between sink, stove and refrigerator, the *work triangle*, should be less than 23 feet.

$d_1 + d_2 + d_3 < 23 \text{ feet}$

Figure 10: the work triangle

Argument (Walking Distance)
The work triangle is an important work triangle denotes the center three main appliances: sink, stove should be less than 23 feet to ensure an efficient work flow in

Argument (Small Room)
In small kitchens where the work

Viewer: Default Viewer

Commands
▶ Show Example Answer (Refrigerator, Sink, Stove)
▶ Show Example Answer (Refrigerator, Sink, Stove)

Catalog Example

One-Wall-Kitchen

The length of the work triangle (Stove, Refrigerator, Sink) is less than 23 feet.

Janus-Construction

Appliance Palette

walls

doors

windows

sinks

stoves

Design units

Catalog

L-Shaped-Kitchen

Clear Work Area
Load Catalog

Critique All
Save In Catalog

Edit Global Descriptions
Select Context

Work Area

Work area

Critic messages

Messages

- ▶ The length of the work triangle [Double-Bowl-Sink-1, Four-Element-Stove-1, Single-Door-Refrigerator-1] is greater than 23 feet.
- ▶ Single-Door-Refrigerator-1 is not near Four-Element-Stove-1.

Commands
▶ Critique All

Argumentative hypertext



FLE Assistant

Assistant

Who is online Update in Webtop Check Statistics Check Advice

fleadmin hovseter1 gruppe8s

Assistant

Who is online Update in Webtop Check Statistics Check Advice

Check Advice

- hovseter1 Over active participant - hovseter1 FLE-oppl ring
- hovseter2 Over active participant - hovseter2 FLE-oppl ring
- elerv Less active participant - elerv Etikk i genetikken
- gruppe8s Less active participant - gruppe8s Etikk i genetikken

Delegate Explain Edit Save

Statistics

Group Performance Single User Performance

Group	Count	Category
hovseter1	8	FLE
hovseter2	9	FLE
hovseter3	4	FLE
hovseter4	5	FLE - oppl�ring

Number of msgs in each category

Thinking Type	Number of Msg	Course	Thinking Type
Problem	9		Progressive Inquiry
My Explanation	196		Progressive Inquiry
Scientific Explanation	31		Progressive Inquiry
Evaluation of the Process	1		Progressive Inquiry
Summary	0		Progressive Inquiry
Problem	1		Progressive Inquiry

Conceptual awareness

Participation measure

Advice

Aggregated performance



Open issues

- It is not enough for a designer to say one has been inspired by a certain idea; it is also necessary to identify relevant success criteria?
- To what extent can one say an idea has been successfully incorporated in a specific design?
- How to distinguish good design from poor designs, along the way it is done in arts and design (e.g. master pieces vs. kitsch design)
- (Kitsch def.: an inferior copy of an existing style)





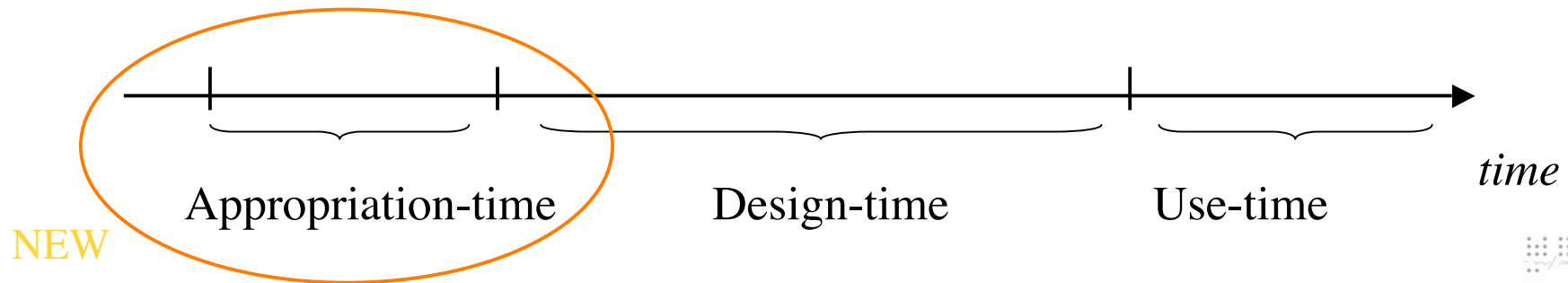
Summary and conclusions

- Re: contributions to a science of design
 - A science of design should be about *processes of designing*
 - Methods, techniques, concepts, tools, and examples
 - The creative act has to be integrated with the design process (as it has with other design disciplines)
 - Integration of theory-based design and participatory design to form *theory-informed collaborative design*
 - A socio-cultural approach to retrospective analysis
 - Concrete examples to illustrate the approach

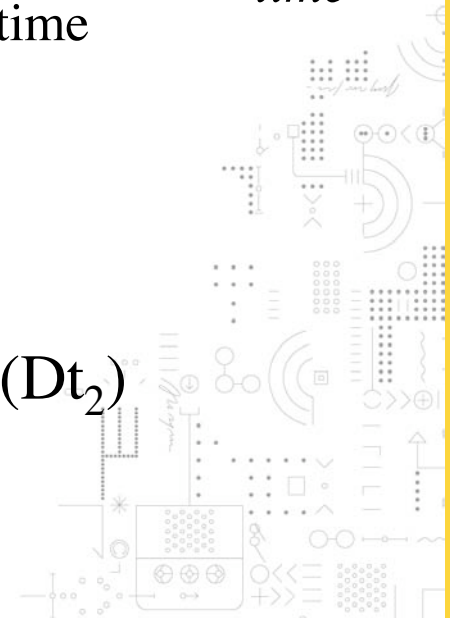




Themes from the workshop (1): Design process of ICT



- Expressed in simple (scientific) terms
- $At_1 \rightarrow Dt \rightarrow Ut \rightarrow At_2$
- Could be followed by EUD and Meta-design (Dt_2)





Themes from the workshop (2): Design rationale cost/benefit

- Previous studies have shown deficiencies of design rationale; i.e. the cost of creating it is not paid back to those who put in the work
- Think about design rationale integration with a product as “appropriation work”
- Then benefits for designers become more visible (extrinsic motivation; seeing ones inspirational idea be expressed in durable form, etc.)

