IDEATION AND CONCEPT DEVELOPMENT

SIMON HOGGAN CHRISTENSEN
LAB COORDINATOR

MESSAGES

COURSE PLAN

Course Schedule 2/3

L= lecture
E=TØ sessions & practical exercises
IW= Individual/group work
A= Assignment hand ins
P= Design or Demo presentation
GIT= Delivered via gitlab.au.dk
BS= Delivered via Brightspace
I= Individual delivery
G= Group delivery

	Week 8/12	Week 9/13	Week 10/14	Week 11/15	Week 12/16	Week 13/17	Week 14/18
Mon	L8 16/3 Concept Development (Simon)	L9 23/3 Sketching User Experiences (Minna) + 14-16 PROTOLab intro (Simon/Gustav)	IW 30/3 Work on sub-assignment 2	EX Tue 7/4 Pitch Workshop 11:30-14:30 (Anne/The Kitchen)	E10 13/4 Physical Prototyping (Simon)	L11 20/4 Prototyping & Academic writing + Related works Q&A (Clemens)	E12 27/4 Figma prototyping 12:00-15:00 (Guest: Maja & Julia)
Wed	E8 18/3 Ideation & concept development 20/3 Supervision session 9-11 (TAs)	24/3 12-16 PROTOLab intro (Simon/Gustav) E9 25/3 Sketching humans and storyboards (Minna + TAs)	**Easter break** 2/4-6/4	P Thu 9/4 Design pitches 10:00–12:00 (All)	15/4 Supervision 10-11:30 (Simon) + watch Academic writing + Related works video (Bs)	E11 24/4 Academic writing Exercises (TAs) L12 22/4 GUI Design (Minna)	IW 29/4 Work on sub-assignment 4 1/5 Supervision 10-11:30 (Simon)
IW	– Finish Fusion 360 & AI and AID tooling exercises and watch the PROTOLab video by 23rd	– Read the articles from Bs before lecture	– Sketch storyboards	– Prepare PPT & pitches for 3 ideas for Thu – Finish sub-assign. 2	– Watch the video before next Mon Lecture	– Start gathering related works – Finish sub-assignment 3	– Finish sub-assignment 4

A

Tooling exercises:
DL InDesign (AID)
22nd March at 15:00

Sub-assignment 2: Field Work [BS/G]
DL: April 8th at 15:00
→ Teachers and TAs feedback

Sub-assignment 3: Design concept [BS/G]
DL: April 24th at 15:00
→ TAs feedback

Sub-assignment 4: Related work [BS/G]
DL: May 1st at 15:00
→ TAs feedback

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26th Jun

	Week 15/19	Week 16/20	Week 17/21	Week 18/22	Week 19/23	Week 20/24	Week 22/26
Mon	P 4/5 Prototype Demo Day 12:00-15:00	IW 11/5 Conduct and report user evaluations	L14 18/5 Logo design (Minna)	L15 25/5 Poster design (Minna)	IW 1/6 Exam info (Minna / Simon)	P 11/6 1st iteration poster presentation & feedback session at 10-12 (Minna & TAs)	P 22/6 Final prototype exhibition with a product poster
Wed	L13 + E13 6/5 Evaluation (Minna) +Evaluation planning (TAs) 8/5 Supervision 10-11:30 (Simon)	IW 13/5 Conduct and report user evaluations	E14 20/5 Logo design exercises 22/5 Supervision 10-11:30 (Simon)	E15 27/5 Poster design exercises 29/5 Supervision 10-11:30 (Simon)	IW 3/6 Final report writing & demo video	IW Finalizing the prototype and poster for the final exhibition	Exams 23-25/6 9:15–> 26/6 Chomsky cleaning & course evaluation discussion
IW	– Write the design and implementation section –Prepare for the user evaluations	– Finish sub-assignment 5 by Tue	–Analyze user study results	– Finish sub-assignment 6 by Fri	– Finish the report by Thursday	– Finish the poster based on the feedback and upload it to Dropbox by 17th June at 12:00	– Everyone needs to be present in the demonstration, exam, & cleaning of the Chomsky & Feedback discussion.

A

Sub-assignment 5: Design & implementation [BS/G]
DL: May 12th at 15:00
TAs feedback

Sub-assignment 6: Evaluation [BS/G]
DL: May 29th at 15:00
TAs feedback

Final report [BS/G]
DL: June 4th at 13:00

Product poster [BS/G]
DL: June 17th at 12:00

TEACHING TIMES

Mondays still 12-14
Wednesdays still 10-12

Some sessions are on other days and times – double check course plan!
Completely done (hopefully ☺) and revised

Friday supervision 10-11.30 from 17/4 – 19/6.
Feedback/supervision can also be requested via email ☺

Remember PROTOLab practical session
23rd (14-16) and 24th (12-16) of March.

PROTOLAB INTRODUCTION WORKSHOP

PROTOLab practical session – 3D printing and Laser cut

23rd of March from 14.15-16: **Groups 1-5** (14 people)

24th of March from 12.15-14: **Groups 6-8 and 11** (15 people)

24th of March from 14.15-16: **Groups 12, 13, 16 and 20** (13 people)

Important to have finished tooling exercises and watch the PROTOLab videos: BS → Week 9/13 → Before class → Link to PROTOLab Tutorial …

PROTOLAB INTRODUCTION WORKSHOP

PROTOLab Tutorial Videos

Owner — Simon Christensen
Tags — Lab License
Created time — March 6, 2025 2:29 PM
3 more properties

Video Introduction to Equipment in PROTOLab

TLDR;

This is how you get access to PROTOLab

1. **Watch all required videos**
2. **Complete theoretical online questionnaire/test**
3. **Complete a hands-on practical session**
3. **Pass the test**
4. **Receive 24h lab access**

Including general rules, safety briefing and tutorials on physical setup at the machines.

This video lecture set will be followed by a practical session planned by your educator or Labtools, and finally it will require you to pass a written multiple-choice test. If successful, you will have 24h access to our prototyping facilities. Once you have 24h access on your card, remember that it is only people who have passed the workshop who can use the equipment! If your mum can keep her hands to herself, she is welcome to come and watch

If you wish to take this PROTOLab tutorial outside of a regular lab course or as a part of your programme, please thoroughly review the video material and contact labtools@cs.au.dk for a practical session - or signup on our online portal here (Beware: the site is under testing):

Apply for Lab License
http://q0wo80g0sow88044wwkg4ck4.157.180.29.222.sslip.io/

If you are getting this tutorial through a course, a pratical session will be automatically planned.

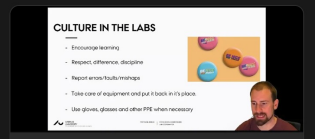
The video set contains six videos, where video 1-5 are absolutely mandatory to participate in a practical session, where the machinery will be tried on your (supervised) own.

Link to CS Lab webpage: https://cs.au.dk/education/chomskylab

Link to final test: https://forms.office.com/e/QudpdPqLGt

Informational videos (total duration 65 minutes)

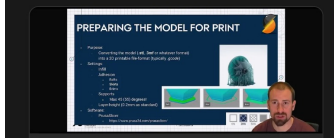
1 Lab Tour Promo Video (03:39 min. duration)
https://www.yout...



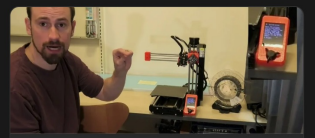
2 General Information and Safety (09:24 min. duration)
https://youtube.c...

3 Laser Cutting (13:32 min. duration)
https://youtube.c...

4 Laser Cutter station and setup (07:40 min. duration)
https://youtu.be/...



5 3D Printing (21:39 min. duration)
https://youtu.be/...



6 3D Printer station and setup (08:37 min. duration)
https://youtu.be/...

SUB-ASSIGNMENT 2

Deadline: 8th of April 2026 at 15.00

Should include:

- **Methods section**: What have you done, which methods did you use, use literature, talk pros/cons, and argue for methodology or lack hereof.
- **Empirical Presentation:** What data have you collected, highlight findings, summarize, describe patterns, present hypotheses.
- **Working models**: Minimum 2 of 5, include descriptive text segment to each. Argue for choice (using, not using).
- **Scenarios:** User scenarios. Sketches. Personas. Add-ons to working models.

Remember to read assignment instructions on Brightspace properly and carefully!

IDEA GENERATION AND CONCEPT DEVELOPMENT

SIMON HOGGAN CHRISTENSEN
LAB COORDINATOR

QUICK LITERATURE OVERVIEW

Girotra et al. (2010): How to be *successful* when doing ideation.

Djajadiningrat et al. (2000): Extreme Characters and Interaction relabelling as a *tool* for generating ideas.

Kensing & Madsen (1992): Future Workshops as a *tool* for generating ideas.

Halskov & Dalsgård (2006): Inspiration Cards as a *tool* for generating ideas.

Carroll (1999): How using scenarios can help formalize your *ideas* into *concepts*.

IDEA GENERATION ~~AND~~ ~~CONCEPT~~ ~~DEVELOPMENT~~

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LAB COORDINATOR

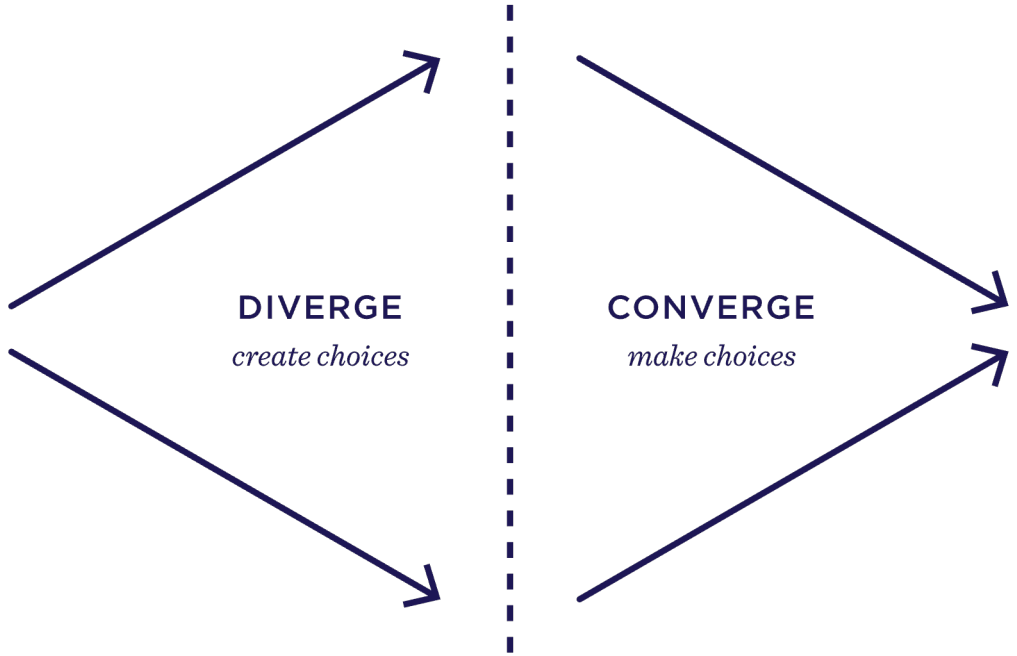
IDEA GENERATION/IDEATION

You have maybe already started this, due to the "Research Through Design"-nature, that you were taught in FITDes.

As mentioned, this course follows the "User-centered Design"-approach.

Everything originates from your empirical work. If your ideas do not fit with tendencies, issues and aspects of your empirical work, it is (probably) not the right idea.

IDEA GENERATION/IDEATION



https://www.ideou.com/pages/brainstorming

IDEA GENERATION/IDEATION

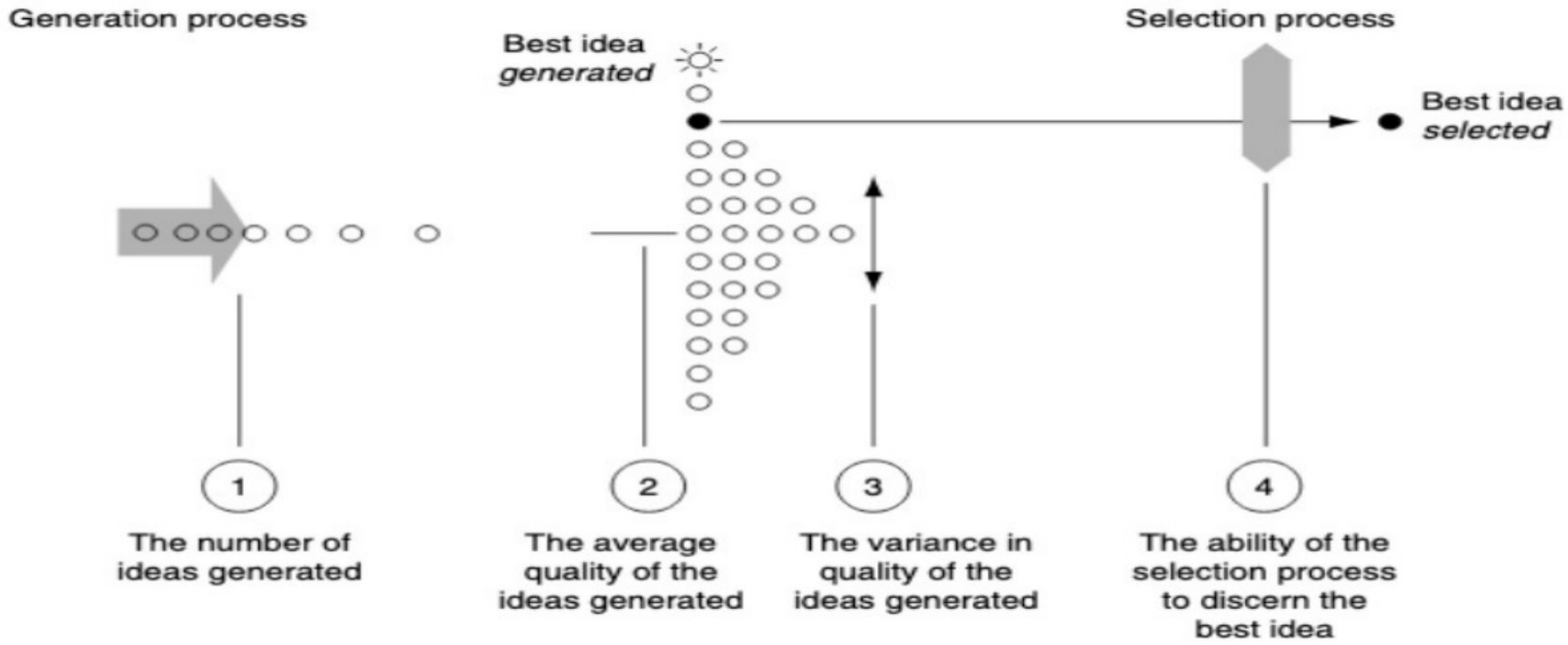
Only a small subset of ideas are good.

As IT-Product Developers we are only interested in the best and most motivated ideas.

To maximise our chance of a good idea, we should maximise the amount of ideas we get.

Karan Girotra, Christian Terwiesch, Karl T. Ulrich, (2010) Idea Generation and the Quality of the Best Idea. Management Science 56(4):591-605. https://doi.org/10.1287/mnsc.1090.1144

IDEA GENERATION/IDEATION



Karan Girotra, Christian Terwiesch, Karl T. Ulrich, (2010) Idea Generation and the Quality of the Best Idea. Management Science 56(4):591-605. https://doi.org/10.1287/mnsc.1090.1144

IDEOs LIST OF BRAINSTORMING PROS

Brainstorming is an effective way to:

Produce a large number of ideas

Generate ideas quickly

Expand your portfolio of alternatives

Get people unstuck

Inject insights from a broader group

Build enthusiasm

Improve team collaboration

https://www.ideou.com/pages/brainstorming

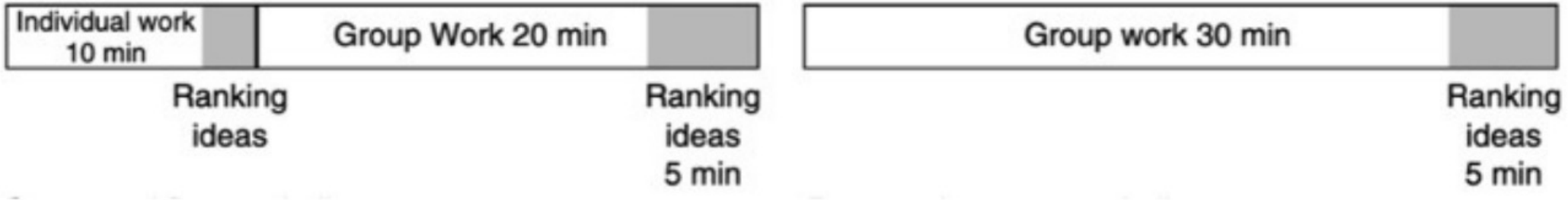
IDEO RULES FOR BRAINSTORMING

1. Defer judgement
2. Encourage wild ideas
3. Build on the ideas of others
4. Stay focused on the topic
5. One conversation at a time
6. Be visual
7. Go for quantity

https://www.ideou.com/pages/brainstorming

TEAM VS HYBRID BRAINSTORMING

Do you believe there is a difference?



Karan Girotra, Christian Terwiesch, Karl T. Ulrich, (2010) Idea Generation and the Quality of the Best Idea. Management Science 56(4):591-605. https://doi.org/10.1287/mnsc.1090.1144

TEAM VS HYBRID BRAINSTORMING

"We find that groups organized in the hybrid structure are able to generate more ideas, to generate better ideas, and to better discern the quality of the ideas they generate."

Karan Girotra, Christian Terwiesch, Karl T. Ulrich, (2010) Idea Generation and the Quality of the Best Idea. Management Science 56(4):591-605. https://doi.org/10.1287/mnsc.1090.1144

TEAM VS HYBRID BRAINSTORMING

1) Hybrid structure is often able to get more and better ideas - and it gets everyone involved!

2) Hybrid structure is better at choosing which ideas are good!

Organizational Arguments for How a Hybrid Structure Influences the Four Factors Underlying Performance

Statistical drivers of the quality of the best Idea	① The number of ideas generated	② The average quality of the ideas generated	③ The variance in quality of the ideas generated	④ The ability of the selection process to discern the best idea
Arguments against team structure in favor of hybrid structure	Free riding Evaluation apprehension Production blocking	Free riding Interaction and build up of ideas (typically argument for teams)	Build up of ideas Group conformity	Limited engagement of team members Path dependence

Karan Girotra, Christian Terwiesch, Karl T. Ulrich, (2010) Idea Generation and the Quality of the Best Idea. Management Science 56(4):591-605. https://doi.org/10.1287/mnsc.1090.1144

TEAM VS HYBRID BRAINSTORMING

Certain group dynamics can be a hinderance for ideation.

Hybrid ideation ensures involvement from the entire team.

Choosing the right idea is more important than coming up with it – and this is truly difficult no matter what type of structure you use.

Let your empirical findings guide these.

Karan Girotra, Christian Terwiesch, Karl T. Ulrich, (2010) Idea Generation and the Quality of the Best Idea. Management Science 56(4):591-605. https://doi.org/10.1287/mnsc.1090.1144

IDEATION METHODS

Inspiration Card Workshops

Future Workshops

Interaction Relabeling / Extreme Characters

(Experience Prototyping/Bodystorming from FITDes – Buchenau & Suri)

INSPIRATION CARD WORKSHOPS

"We present the Inspiration Card Workshop as a collaborative method for combining findings from domain studies, represented in Domain Cards, with sources of inspiration from applications of technology, represented in Technology Cards, to create new concepts for design."

Domain card: People, settings, situations, contexts. Can be divided into multiple card types.

Technology cards: A technology or "system" of tech.

Inspiration card: Domain card + Technology card

Halskov, K., & Dalsgård, P. (2006, June). Inspiration card workshops. In Proceedings of the 6th conference on Designing Interactive systems (pp. 2-11). ACM.

INSPIRATION CARD WORKSHOPS

Structure (4-6 person teams):

- Create several domain and tech cards per participant (5 min)
- Introduce cards (7 min)
- Use combinations of cards to create new concepts (10 min)
- Present each idea in the group and refine (7 min) (requires one facilitator and one time-keeper)

Documentation:

- Document each idea on A3 paper
- Title, users, what and why
- Use sketches and cards on the A3 poster
- Annotate and refine in the presentation phase

INSPIRATION CARD PROCESS

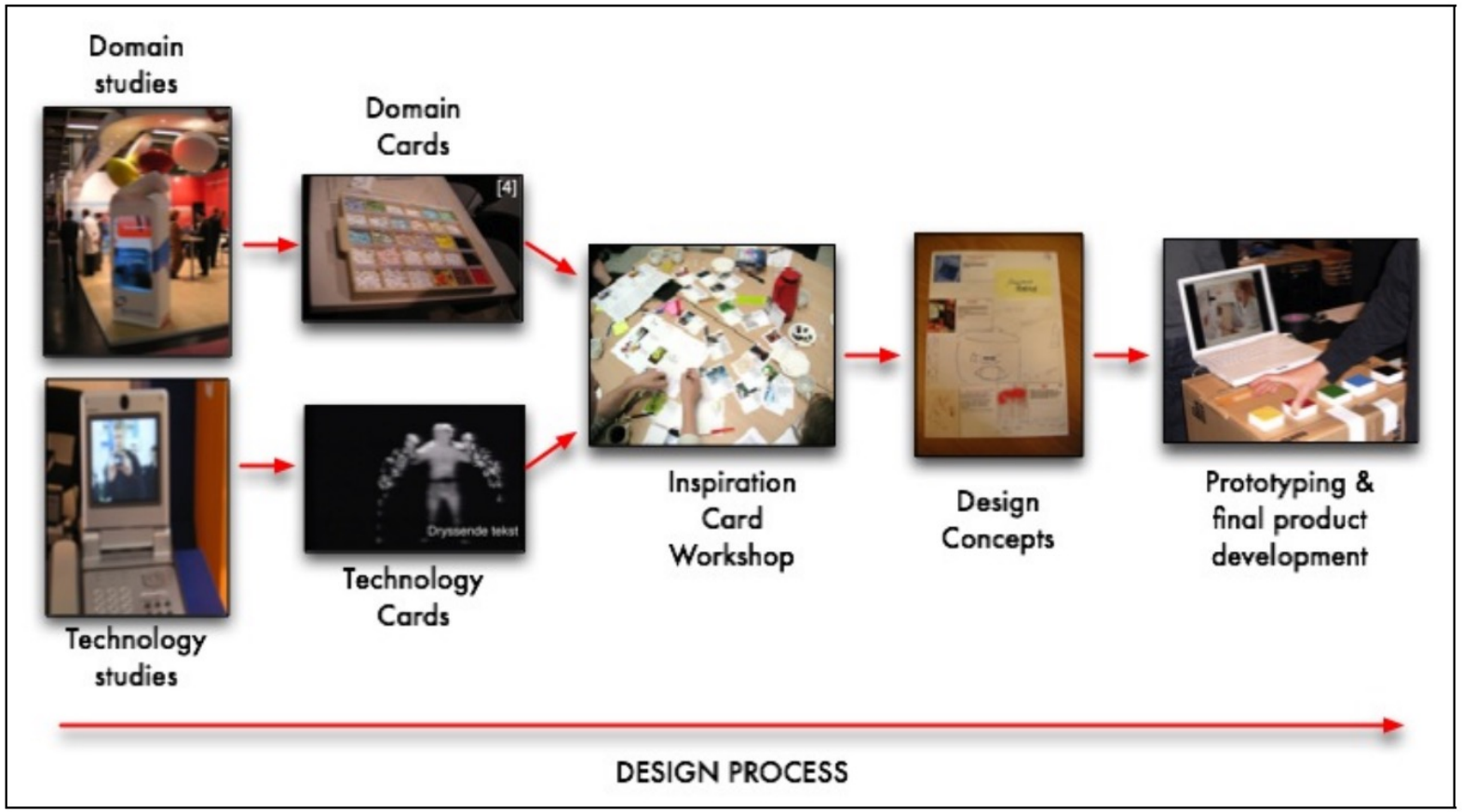


Figure 5: The Inspiration Card Workshop in the Design Process

:ov Madsen. 1992. Generating visions: future workshops and metaphorical design. In Design at work, Joan Greenbaum and Morten Kyng (Eds.). L. Erlbaum Associates Inc., Hillsdale, NJ, USA 155-168.

INSPIRATION CARDS

Pros:

Rapid Idea Generation

Combines domain observations with tech

High throughput of ideas

Might highlight ”misunderstandings” or behavioral misconceptions

Cons:

Can be too technology centric

Subject to group dynamics (same as before)

Can be somewhat “limited” by the cards

FUTURE WORKSHOPS

A Future Workshop is divided into three phases: the Critique, the Fantasy, and the Implementation phase. Essentially the Critique phase is designed to draw out specific issues about current work practice; the Fantasy phase allows participants the freedom to imagine "what if" the workplace could be different; and the Implementation phase focuses on what resources would be needed to make realistic changes. These phases are surrounded by preparation and follow-up periods.

Finn Kensing and Kim Halskov Madsen. 1992. Generating visions: future workshops and metaphorical design. In Design at work, Joan Greenbaum and Morten Kyng (Eds.). L. Erlbaum Associates Inc., Hillsdale, NJ, USA 155-168.

FUTURE WORKSHOPS

Structure:

Critique phase (10 min)

Fantasy phase (10 min)

Implementation phase (10 min) (requires one facilitator and one time-keeper)

Documentation:

Document each issue in each phase

Summarise key ideas

Written descriptions, short scenarios, details, etc.

Identify next steps for each idea

FUTURE WORKSHOPS

Pros:

Problem focused

Includes domain knowledge and observations

Participatory and co-creative

Cons:

Might focus on symptoms and shallow problems, but not underlying issues

Implementation centric

(Can be) Time consuming

INTERACTION RELABELLING/EXTREME CHARACTERS

"Moving beyond a narrow focus on usability [...] requires new methods for understanding design possibilities. Here we describe two: interaction relabelling, in which possible interactions with a known mechanical device are mapped to the functions of an electronic device to be designed; and extreme characters, in which fictional users with exaggerated emotional attitudes are taken as the basis of design to highlight cultural issues."

Can be used individually

Djajadiningrat, J. P., Gaver, W. W., & Fres, J. W. (2000, August). Interaction relabelling and extreme characters: methods for exploring aesthetic interactions. In Proceedings of the 3rd conference on Designing interactive systems: processes, practices, methods, and techniques (pp. 66-71). ACM.

INTERACTION RELABELING EXERCISE

Structure:

Pick an idea and either a completely random artifact, or an artifact from within the community.

Relabel the prop to work for your idea.

Documentation:

Describe the initial idea

Summarise the interaction relabeling.

Summarise how the exercise has changed your previous idea

INTERACTION RELABELING/EXTREME CHARACTERS HYBRID EXERCISE

Structure:

Pick an idea and an unrelated product

Relabel the prop to work for your idea

Redesign it for an extreme character (requires one facilitator and one time-keeper)

Documentation:

Describe the initial idea

Summarise the interaction relabeling and the extreme character design

Summarise how the exercise has changed your previous idea

INTERACTION RELABELING/EXTREME CHARACTERS

Pros:

Good for reframing your understanding of the design space

Excellent for breaking fixation

Cons:

Conceptualizes, generates thoughts, and perspectives rather than new ideas

Small throughput - but plenty of reflection

~~IDEA GENERATION AND~~ CONCEPT DEVELOPMENT

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CONCEPT DEVELOPMENT

So now you have an idea

How do you mold this into a concept?

What is the difference?

Concept = "Conceptus" = "that which is conceived or formed in thought"
Develop = "Desveloper" = "Disvolvere" = to unveil/to unwrap

You need to communicate and "sell" your idea, before it is a concept.
Scenarios can help with this, and trigger multiple considerations/reflections.

SCENARIOS

”Harry is interested bridge failures; as a child, he saw a small bridge collapse when its footings were undermined after a heavy rainfall. He opens the case study of the Tacoma Narrows Bridge and requests to see the film of its collapse. He is stunned to see the bridge first sway, then ripple, and ultimately lurch apart. He quickly replays the film, and then opens the associated course module on harmonic motion. He browses the material (without doing the exercises), saves the film clip in his workbook with a speech annotation, and then enters a natural language query to find pointers to other physical manifestations of harmonic motion. He moves on to a case study involving flutes and piccolos.”

Carrol, J. M. (1999, January). Five reasons for scenario-based design. In Systems Sciences, 1999. HICSS-32.

SCENARIOS

"Scenarios are stories. They are stories about people and their activities." – Carroll (1999)

An externalisation of, e.g., the context, the design space, design ideas, an interaction, a feeling, etc.

Different representations:

Written stories, sketches, videos (Binder 1999)

Pictures (Pedell et al. 2004).

Personas (Chang et al. 2008).

Techsonas (Bødker & Klokmose 2013).

Drama and props (Brandt & Gunnet 2000).

SCENARIO-BASED DESIGN: PRINCIPLES... OR PROBLEMS?

Action vs. Reflection

Design Problem Fluidity

Design Moves Have Many Effects

Scientific Knowledge Lags Design Application

External Factors Constrain Design

ACTION VS REFLECTION

Carroll: Prototypes are amazing, but

“There is a fundamental tension between thinking and doing: thinking impedes progress in doing, and doing obstructs thinking”...

Scenarios can be used for (self-)reflection about actors, roles, communities and tasks

“[Scenarios are] vivid descriptions of end-user experiences [that] evoke reflection about design issues”

DESIGN PROBLEM FLUIDITY

"Design, and especially the design of new technology, undermines the stability of the world [...]"

It is vital to ensure that everyone always agrees on the requirements of the project.

"Scenarios (edit: can) concretely fix an interpretation and a solution, but are open-ended and easily revised"

DESIGN MOVES HAVE MANY EFFECTS

"Every element of a design, every move that a designer makes, has a variety of potential consequences."

"Scenarios can be written at multiple levels, from many perspectives, and for many purposes."

We can, with a design, end up creating more/worse problems/issues if we are not careful.

SCIENTIFIC KNOWLEDGE LAGS DESIGN APPLICATION

How do we make sure, that we actually learn something from design activities?

When does knowledge become applied practice?

“Scenarios can be abstracted and categorized to help design knowledge cumulate across problem instances”

“The design and development of technology aspires to occupy the high, hard ground [...] but at the same time, technology design and development is inevitably driven to pursue novelty and innovation”

EXTERNAL FACTORS CONSTRAIN DESIGN

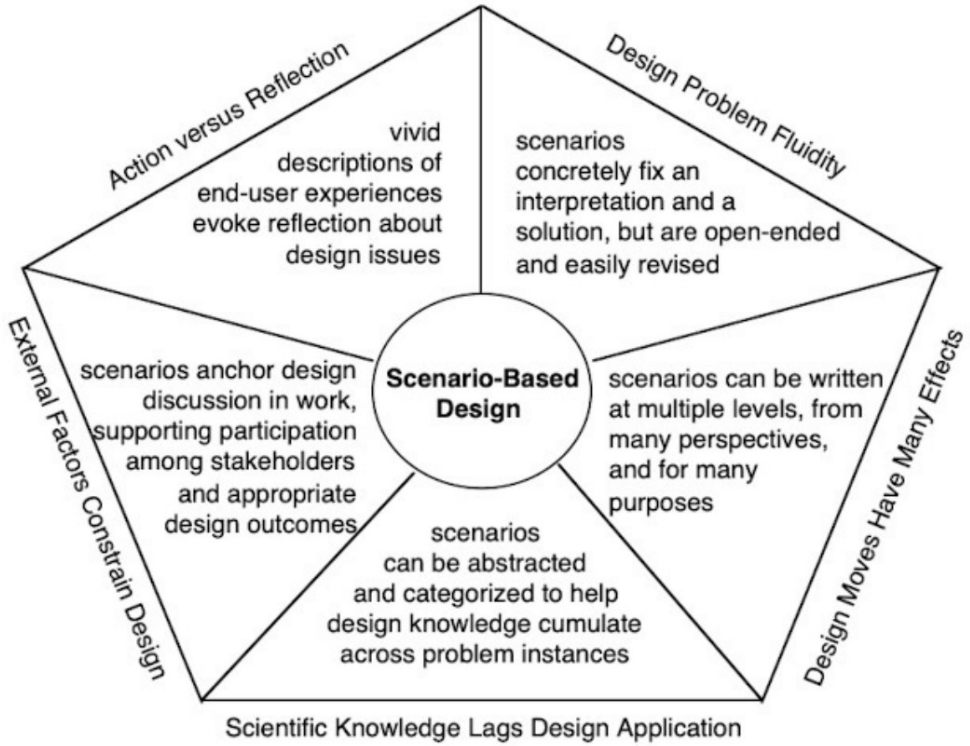
Requirements are formed from empirical data; work, tasks, culture, people, and other external factors (technological development).

Scenarios are great at anchoring requirements in practice, or with a new design.

Scenarios can help explore interaction/technology possibilities without investing in prototype development.

Designers must have constraints; there are just too many things that might be designed. Requirements, if they can be identified, are clearly the best source of constraints because they indicate what sort of design work is needed. But there are many other sources of constraints. The current state of technology development makes some solutions impossible and others irresistible: On the one hand, designers cannot use technology that does not yet exist, though their work often drives technology development toward possibilities that are nearly within reach. On the other hand, designers, like everyone else, are caught up in a technological zeitgeist that biases them toward making use of the latest gadgets and gizmos. In addition, designers are often biased toward deploying technologies they have used before, even when they are aware of limitations in these technologies.

SCENARIOS



Carrol, J. M. (1999, January). Five reasons for scenario-based design. In Systems Sciences, 1999. HICSS-32.

SCENARIOS SUMMARY

We need ways to manifest and maintain our requirements, ideas and knowledge.

IT Product Development has many challenges; knowledge, practice, fluidity, context, contraints.

We also need team-based consensus regarding above.

Scenarios are a good way to ensure (or reflect upon) this.

Scenarios can anchor and ”test” your ideas.

LAST BUT NOT LEAST

Definition is what makes a concept:

Planning
Speccing
Rapid prototyping
Researching (and READING!)
UI drafts
Usability/User Experience notions

All of the above adds to a defined mental construct and shared understanding