Schedule

09:15 – 10:00 Lecture

10:00 – 10:15 (Salu out of the session – You will be interviewed)

10:30 – 11:00 Reflecting on the Dialogical Learning Fair

11:00 – 12:00 Taking the next steps in the project

Learning Goals

- What is the core (learning) challenge of this course?
  - Big picture vs the challenge of the day – Conceptual reflection
    - Donald Schön – Reflective Practitioner 1983
  - Core challenge is to learn how to work with different people with different sets of skills, how to communicate ideas clearly, and work with certain parameters (for example, the elements of IoT)

Online / Hybrid Teaching and Learning

- The contexts of learning in different courses vary significantly, as to the educational aims of the settings.
  - Lectures
  - Projects
  - Teamwork
  - Exercises
  - Workshops
  - Lab / studio work
  - Exams

Expertise vs. Reflection

- Technical schools tend to emphasise the building of domain-specific expert knowledge and skills.

Expertise vs. Reflection

- Basic structure of a common expert course

1. Repeat until exam
    1. Lectures
    2. Exercises
2. Mid-term exam
3. Repeat until exam
    1. Lectures
    2. Exercises
4. Final exam

Expertise vs. Reflection

- Design schools tend to emphasise the cultivation of reflective skills and open-ended dialogue.

Expertise vs. Reflection

- Basic structure of a common reflective course

1. Project briefing
2. Multi-disciplinary and contextual teamwork / project work
3. Presentation of initial stuff
4. More project work
5. Presentation of final stuff

Why are the courses so different?

- Why do we need to educate students with these foundationally different kinds of skills (expertise vs. reflection)?

Conceptual Design vs. Creating Things That Work

- The physical world does not care what you think about it. It only responds to your action on it.

Conceptual Design vs. Creating Things That Work

- IoT devices act on the physical world in a very precise manner.

$$\nabla \cdot \mathbf{D} = \rho_V$$

$$\nabla \cdot \mathbf{B} = 0$$

$$\nabla \times \mathbf{E} = -\frac{\partial \mathbf{B}}{\partial t}$$

$$\nabla \times \mathbf{H} = \frac{\partial \mathbf{D}}{\partial t} + \mathbf{J}$$

Conceptual Design vs. Creating Things That Work

- The experienced world is all about our perception of it and of our capabilities to act upon it.

Conceptual Design vs. Creating Things That Work

- The experienced world is all about our perception of it and of our capabilities to act upon it.

Gauss' law $\nabla \cdot \mathbf{D} = \rho_V$

Gauss' magnetism law $\nabla \cdot \mathbf{B} = 0$

Faraday's law $\nabla \times \mathbf{E} = -\frac{\partial \mathbf{B}}{\partial t}$

Ampere's law $\nabla \times \mathbf{H} = \frac{\partial \mathbf{D}}{\partial t} + \mathbf{J}$

Maxwell's equations

Conceptual Design vs. Creating Things That Work

- The experienced world is all about our perception of it and of our capabilities to act upon it.

André-Marie Ampère

Carl Friedrich Gauss

Michael Faraday

James Clerk Maxwell

https://rwi.lu.se/2020/02/women-in-science/

So what?

So what?

- Innovation projects are learning projects

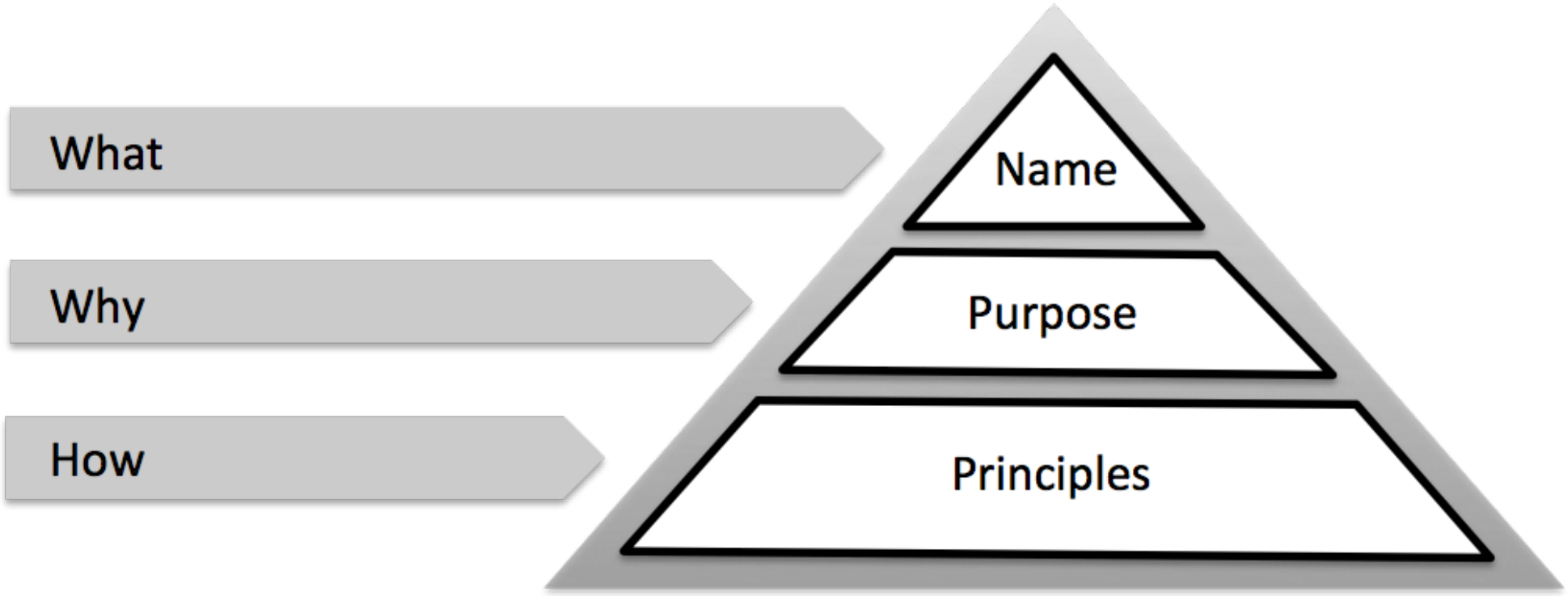
So what?

- Innovation happens in the intersection of multiple ‘realities’ or ‘worlds’

[We need to bring the worlds together.]

[Conceptual Designing]

Minimal Design Concept



Ylirisku, S. (2013). Frame it Simple! Towards a theory of conceptual designing [Doctoral dissertation]. Aalto University.

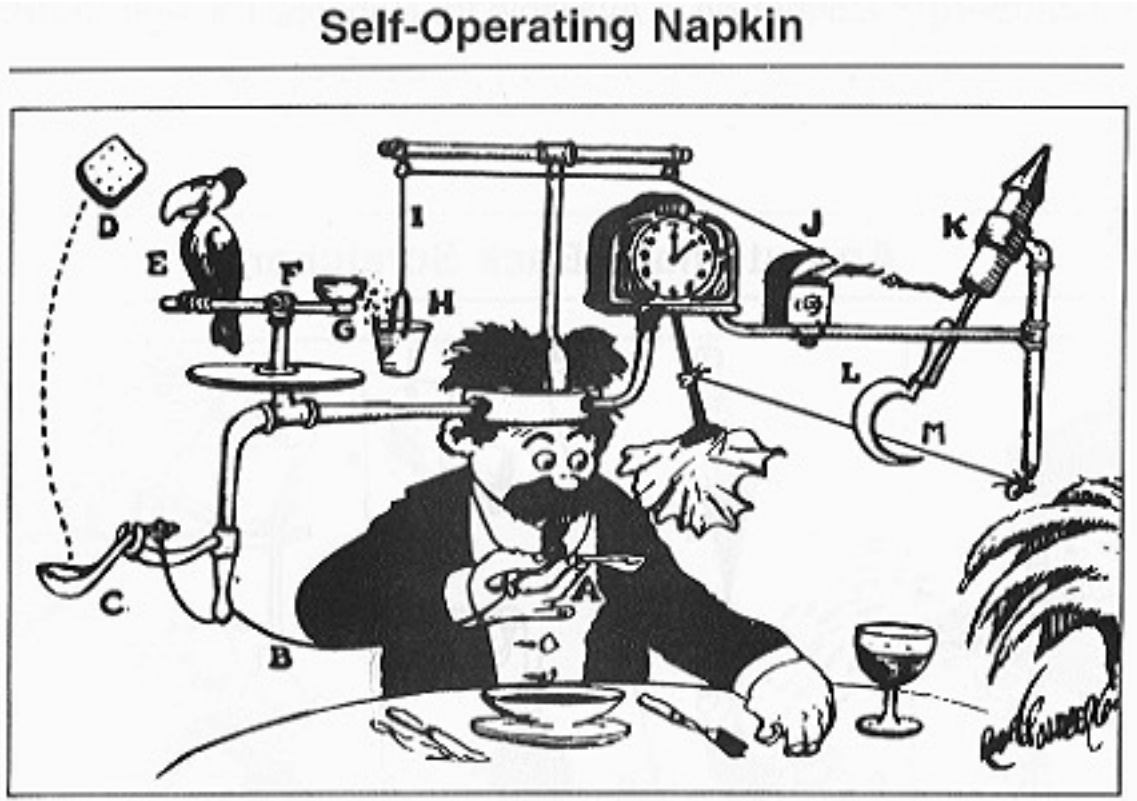
The aim:
To create a design concept that is

1. …as relevant as possible in terms of effort
2. …as simple as possible in terms of user experience
3. …as clear as possible in terms of design requirements

- These points are opinionated.
- These points have inherent tensions.

The Tension of Relevance: Impact vs. Investment

- You need to be able to identify a problem that is relevant to the users of your design outcome.
- You also need to ensure that the utilised approach and technology is a relevant way to solve this problem.



Rube-Goldberg Machines

The Tension of Simplicity: Novelty vs. Understanding

- The more complex and deep a given topic is, the more demanding it is to learn and to master.
- Concept design projects are always unique efforts that aim to discover and define something novel.

Stupid simplicity

Which one is salt?

https://www.amazon.com/Salt-Pepper-Shakers-Farmhouse-Decorative/dp/B07SD25TMM

The Tension of Clarity: Esotery vs. Familiarity

- The very precise and ambiguous expressing of something may necessitate the use of a specialist language that is understood only by the experts.
- In order to validate the requirements, they must be expressed in a language that are understood by the users (and other stakeholders).

[Eschew obfuscation!]

Dialogical Learning Fair

- The aim was to utilise everybody's experience to learn about the potential of emergent ideas
  - Based on our research on 'resourcing of experience'

    Ylirisku, S., Buur, J., & Revsbæk, L. (2016). Resourcing of Experience in Co-Design. *Proceedings of the 11th Design Thinking Research Symposium, DTRS'11*. The 11th Design Thinking Research Symposium, DTRS'11, Copenhagen, Denmark.

  - And on 'tensions between expert and reflective skills'

    Ylirisku, S., & Filz, G. (2018). *Resolving 7 tensions in-between design and engineering education: Cases for reflective studio practice*. IV Int. Conference on Structural Engineering Education Structural Engineering Education Without Borders, Madrid, Spain.

Dialogical Learning Fair

- The event was designed to enable you to
  - A) present your idea multiple times and
  - B) get as **relevant, constructive,** and **effective** feedback and feedforward as possible

Dialogical Learning Fair Experience: How was it?

- Discuss in teams 10 minutes
  - Collect your notes here: https://miro.com/app/board/o9J_lhzrFv8=/?invite_link_id=185693922396

Towards Key Design Requirements: Challenges with your ideas

- Ideas call for different kinds of research
- Research that ensures the relevance of the effort:
    - Is the problem important? Is it best solved as an IoT system?
- Research that ensures the simplicity of UX:
    - Validation with users – maybe – or better do an iteration first?
- Research that ensures the clarity of expectations:
    - System breakdown – maybe – or elaboration of what it should do? How to conceptualise the functions and the parts?

Cue T

- Head movement tracker
- Feedback to teacher

- Relevance? -> prototype
- Simplicity? -> prototype (what is the feedback?)
- Clarity? -> prototype

Eye-rest

- Easing up screen fatigue

- Relevance? -> prototype
- Simplicity? -> prototype (what would motivate?)
- Clarity? -> prototype

Important moments capture

- Capturing a chosen moment of an online lecture
- Send data in an organised format to the cloud

- Relevance? -> prototype
- Simplicity? -> prototype (what is the data and how u access it?)
- Clarity? -> prototype

Energy Light

- Connected light knows your rhythms

- Relevance? -> prototype
- Simplicity? -> prototype (what does the lamp know?)
- Clarity? -> prototype

Peer Up

- A “Tinder for co-learning” - Peer assistance – enables socialising, belonging, motivation

- Relevance? -> prototype
- Simplicity? -> prototype (what is the most important function?)
- Clarity? -> prototype

Assistance device

- Pocket sized device, held in the classroom
- Call for assistance + instant feedback

- Relevance? -> prototype
- Simplicity? -> prototype (how do the buttons work?)
- Clarity? -> prototype

Jabra on Steroids

- A speaker that displays a ‘hologram’ of the speaker

- Relevance? -> prototype
- Simplicity? -> prototype (how does the hologrammed feel?)
- Clarity? -> prototype (how to create the image?)

Synced sound experience

- Syncing the online / virtual soundscape with the learning situation, e.g., accomplishing a task

- Relevance? -> prototype
- Simplicity? -> prototype (what are the accomplishments?)
- Clarity? -> prototype

Semi-automated coffee injector

- Keeping you caffeinated

- Relevance? -> prototype
- Simplicity? -> prototype (how to believe, trust and control?)
- Clarity? -> prototype

Tactile kahoot

- Learning game

- Relevance? -> prototype
- Simplicity? -> prototype (how to input and get feedback?)
- Clarity? -> prototype

Wednesday Schedule

30 min - time slots for teams @Stage – House open all time

1. 09:15 – Team 9
2. 09:45 – Team 6
3. 10:15 – Team 4
4. 10:45 – Team 8
5. 11:15 – Team 3

Lunch

6. 12:45 – Team 7
7. 13:15 – Team 10
8. 13:45 – Team 5
9. 14:15 – Team 1
10. 14:45 – Team 2