Human-Computer Interaction COMS21301

Design Thinking

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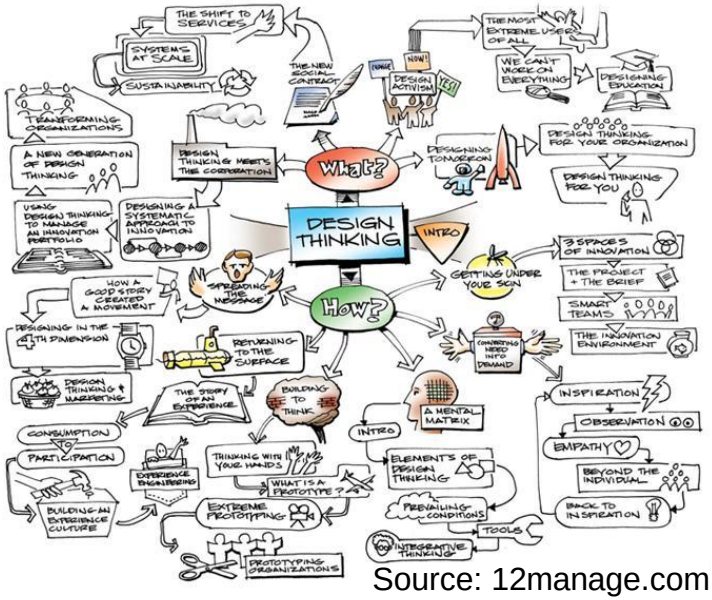

Source: 12manage.com

References

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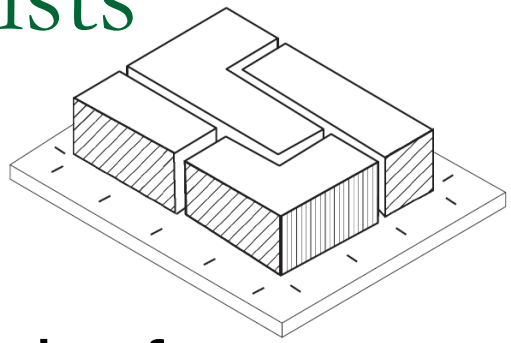
Logic and reasoning

- Reasoning is the process of using existing knowledge to draw conclusions, make predictions, or construct explanations
  - Deductive Reasoning
    - A true premise and a sound argument provide a true conclusion
  - Inductive Reasoning
    - Gathered evidence leads to most likely conclusion
  - Abductive Reasoning
    - Partial evidence leads to best guess conclusion

Reasoning through known problems

- Deductive > Inductive > Abductive?
  - Most game-changing work is the result of creative leaps
  - E.g. Einstein's work is empirically verified but was reasoned through thought experiments
- Strictly speaking, even abductive reasoning is only possible for well-known problems
  - What if it is unclear which problems are most important?

Lawson's Architects vs Scientists (1979)



- Given more blocks than required
- Single storey arrangement of three by four modular bays
- Vertical faces coloured red and blue
- Make perimeter wall as red or blue as possible
- 'hidden' rules governing allowed relationships blocks; rules were changed for each problem
- Over 6000 possible answers (i.e. simple!)

Lawson's Architects vs Scientists (1979)

- Scientists
  - test designs using as many different combinations of blocks as quickly as possible
  - discover the rule governing which combinations of blocks were allowed
- Architects
  - select blocks in order to achieve appropriately coloured perimeter; then test
  - try next most favourably-coloured block combination substituted until an acceptable solution discovered

Lawson's Architects vs Scientists (1979)

- Scientists focus attention on understanding underlying rules
- Architects focus on achieving desired result

What is Design Thinking?

- Solution-based design vs Problem-based design
  - Finding good solutions for ‘known’ problems
    - What about those problems is really well-known?
    - Are those problems important?
  - Finding good problems for ‘known’ solutions
    - What about those solutions is really well-known?
    - Are those solutions useful?
- Keeping your eye on the goal
- ‘Systems Thinking’

Holistic Design

- Designing the whole rather than the parts
- Beyond ‘bottom-up’ or ‘top-down’ design
- What is ‘the whole’?
  - Context sensitive
  - Context renewing
  - Accepting ambiguity and change
  - Accepting that innovations are ‘made at home’ and appropriated

Stanford dSchool 'Mindsets'

- Focus on Human Values
  - Empathy for the people you are designing for and feedback from these users is fundamental to good design.
- Show, Don't Tell
  - Communicate your vision in an impactful and meaningful way by creating experiences, using illustrative visuals, and telling good stories.
- Craft Clarity
  - Produce a coherent vision out of messy problems. Frame it in a way to inspire others and to fuel ideation.

Stanford dSchool 'Mindsets'

- Embrace Experimentation
  - Prototyping is not simply a way to validate your idea; it is an integral part of your innovation process. We build to think and learn.
- Be Mindful of Process
  - Know where you are in the design process, what methods to use in that stage, and what your goals are.

Stanford dSchool 'Mindsets'

- Radical Collaboration
  - Bring together innovators with varied backgrounds and viewpoints. Enable breakthrough insights and solutions to emerge from the diversity.
- Bias Toward Action
  - Design thinking is a misnomer; it is more about doing than thinking. Bias toward doing and making over thinking and meeting.

Four principles of design thinking

- 1. All design is social
  - Human-centred point of view
  - Focusing on the real world
  - ‘In the wild’
  - Observe and satisfy real needs
  - Acknowledge human factors

Four principles of design thinking

- 2. Preserve Ambiguity
  - Chance discoveries are impossible in well-defined settings
  - Fear of failure is not a reason for creating constraints
  - Freedom to fail is the basis of good design
  - It is not necessary to fully understand an idea to try it

Four principles of design thinking

- 3. All design is re-design
  - Human needs remain broadly the same
  - Current solutions are usually rather good
  - Conditions change and require forecasting
  - Changes are social and technical

Four principles of design thinking

- 4. Tangibility improves Communication
  - Prototypes are suggestions, not stages of implementation
  - A physical demonstration expresses and facilitates imaginations
  - Editing text improves the clarity of ideas; editing prototypes improves the clarity of designs

Practical design thinking methods

- What? How? Why?
- Interview
- Extreme users
- Saturate and group
- I like, I wish, What if?
- …
- See, e.g., dschool bootcamp bootleg:
- http://dschool.stanford.edu/use-our-methods/

An example: the LED

- What can you do with an LED?

An example: the LED

- What can you do with an LED?
- Switch it on and off
- Set its rate of flashing
- Change its rate of flashing
- Crowdsource a network
- Deliberately blow it up within a timeframe
- Wear it as jewellery
- Give someone a massage with it
- Kill someone with it

Conclusions

- Are you trying to make something or discover something?
- Design Thinking is a solution-based design activity
- You need to concentrate on what people want or need, not what you can give them
- Prototyping matters to explore design spaces, not (just?) to iterate development
- Making ideas tangibility helps designers think individually and collectively
- Next time: Tangible Interfaces