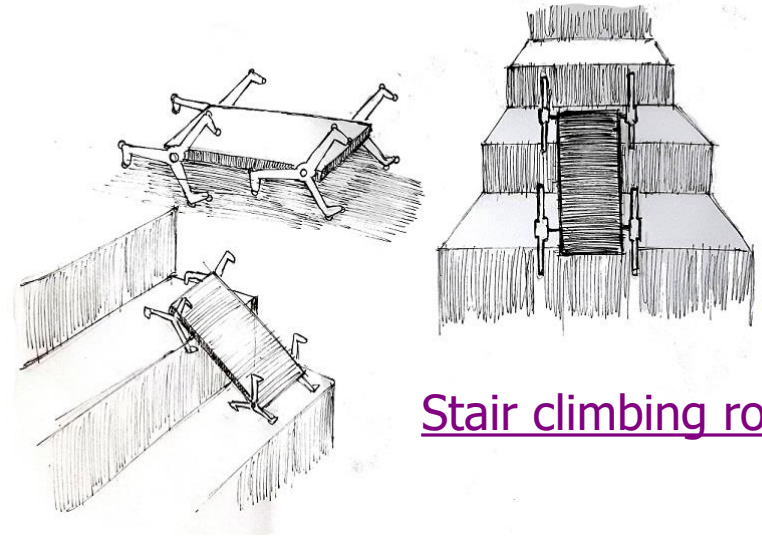




Special Topics in Design I  
(Prototyping in IOT)  
DSL 810

Topic 2  
Project Proposal  
Instructor: Jay Dhariwal,  
Asst. Prof., IIT Delhi

16<sup>th</sup> January 2020



## Previous projects

- [DIY Cell phone Video](#)
- [Spectrophotometer](#)
- [Open source laser cutter](#)
- [Biometric attendance system](#)
- [Sketch your project Mirror clock](#)
- Other course projects
- Product realization + Makerspace trainings

# Project examples

- [Medical Device](#) – CAD, Mechanical, Electronics, Integration
- Electric bike conversion kit [Project Proposal](#) [Final Project](#)
- Design and Fabrication of xy plotter [Mechanical Design](#) [Machine Automation](#) Demo
- [Final Projects 1](#) [Fab Final Projects 5](#) [Karan Tanna](#)
- Projects on [Instructables](#) [LED cube](#) [Fingerprint Door opener](#) [Air Guitar](#) [Smart Garbage Monitoring](#) [Air quality detector](#)

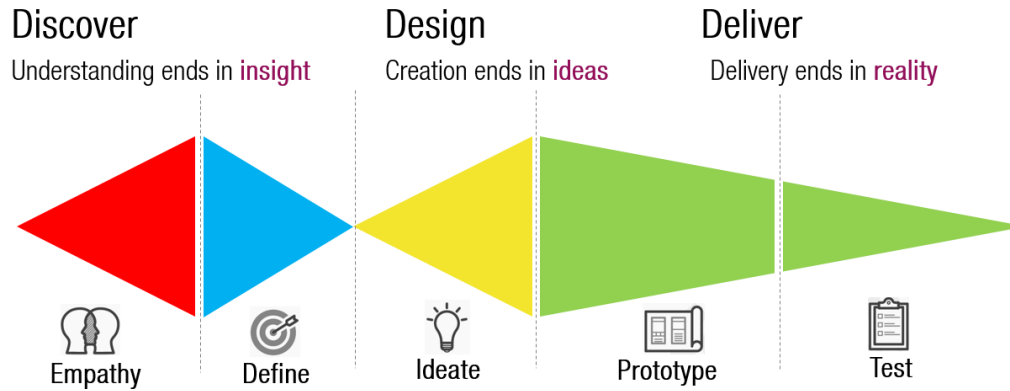


# Project Proposal

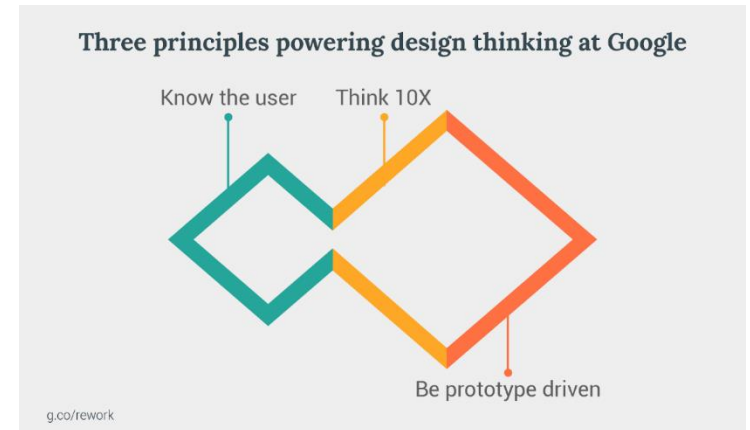
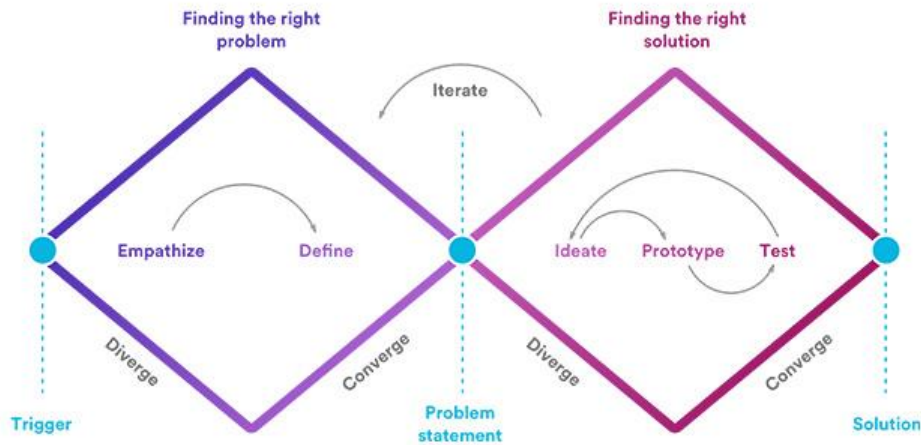
- Sketch your final project idea(s)
- Describe what it will do and who will use it
- Challenges foreseen, Components required, Skills used, Timeline
- Your project should use both your electronics (input+output device) + ( $\mu$ C + embedded programming) skills, UI in laptop/mobile app.
- CAD+ additive/subtractive fabrication (Optional)
- Individual projects vs groups of two projects (individual mastery of skills and independently operable). Complete project – it should do something, Rigor.
- **In this course, design phase would be short of a week.** Focus on prototyping.

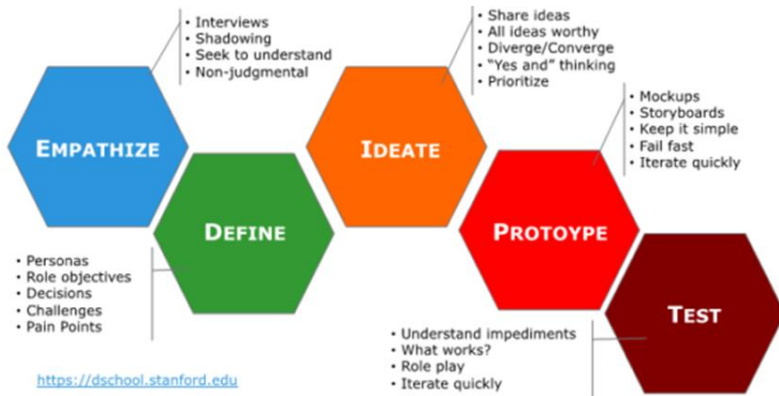


# DESIGN THINKING MODEL



Design Thinking is an iterative and non-linear process in which we seek to understand the user, challenge assumptions, and redefine problems in an attempt to identify alternative strategies and solutions that might not be instantly apparent with our initial level of understanding.

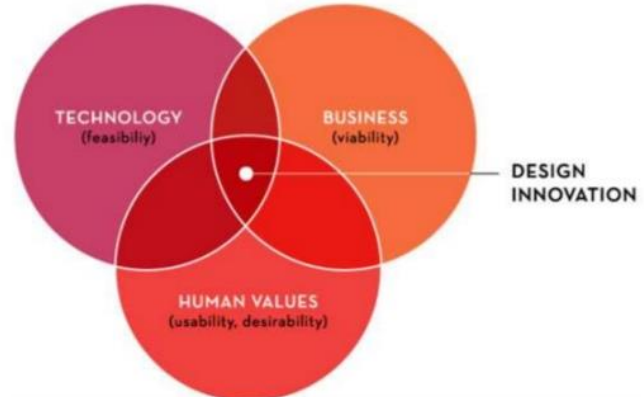




<https://dschool.stanford.edu>

## // Integrated process

*An integrated process: a process that deliberately integrates necessary disciplines*



Jaap Daalhuizen - Technical University of Denmark - 5<sup>th</sup> of October, 2016

# Design Thinking at work



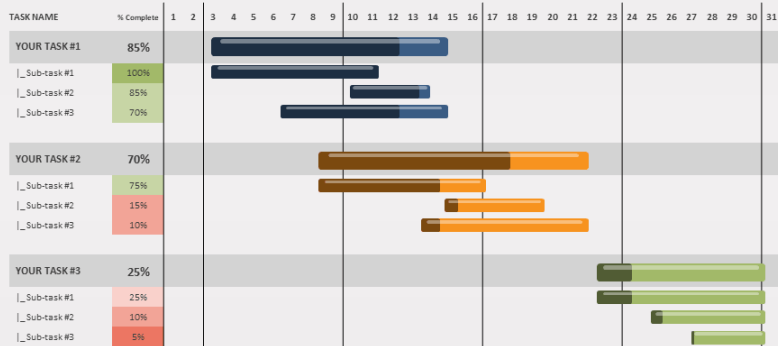
# Design Thinking - Tim Brown, CEO and President of IDEO



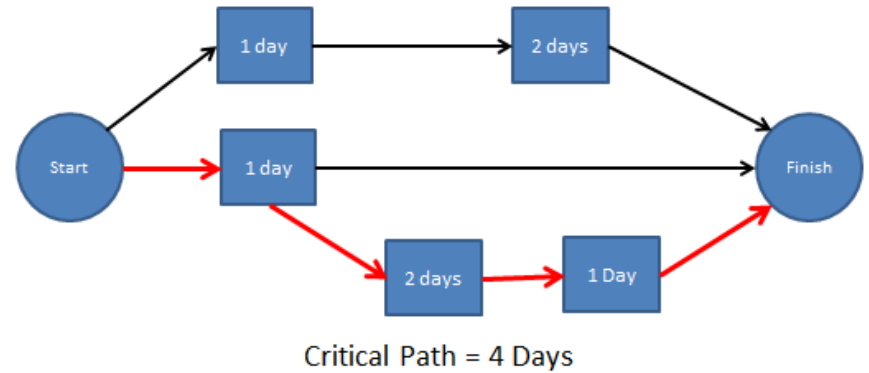
1. Divergent thinking (instead of convergent thinking, exploring possibilities)
  2. Integrated, holistic thinking (instead of analytically to one part of the problem). Work to resolve desirability, feasibility, viability.
  3. Design is human-centered, meet needs – instead of starting from technology or business.
  4. Can apply to any product or system (digital or physical)
  5. Prototyping speeds up the innovation process. How fast at prototyping?
  6. Build movements
  7. Design is moving from consuming to creating meaningful, participative experiences
  8. Collaboration, trust, playfulness
- [OpenIDEO: Social Impact Powered By Design Thinking](#)



## Gantt Chart – Slide Template



www.presentationgo.com



## Critical Path Method

# Project Management tips

- Fab Academy [Notes Video](#) (29:40-39:40)
- Spiral Development
- Demand side vs. Supply side Time Mgmt.
- Bottom up vs. Top down debugging
- Document as you work



# Searching for projects

- Fab academy navigation  
[Fab house](#),  
[Boat](#),  
[Weather station](#),  
E-bike, other keywords?
- Instructables (Arduino based projects)
- <http://techpedia.in/> (Search projects)
- Other DIY sites
- Stand on the shoulder of giants
- [Flying Man](#)

# Assignment

- [Assignment 2](#) due on 3<sup>rd</sup> February

# Summary

- Looked at previous projects at DoD, Fab Academy, Instructables
- Design Thinking
- Project Management tips
- Searching for Projects
- Work on Project Proposal