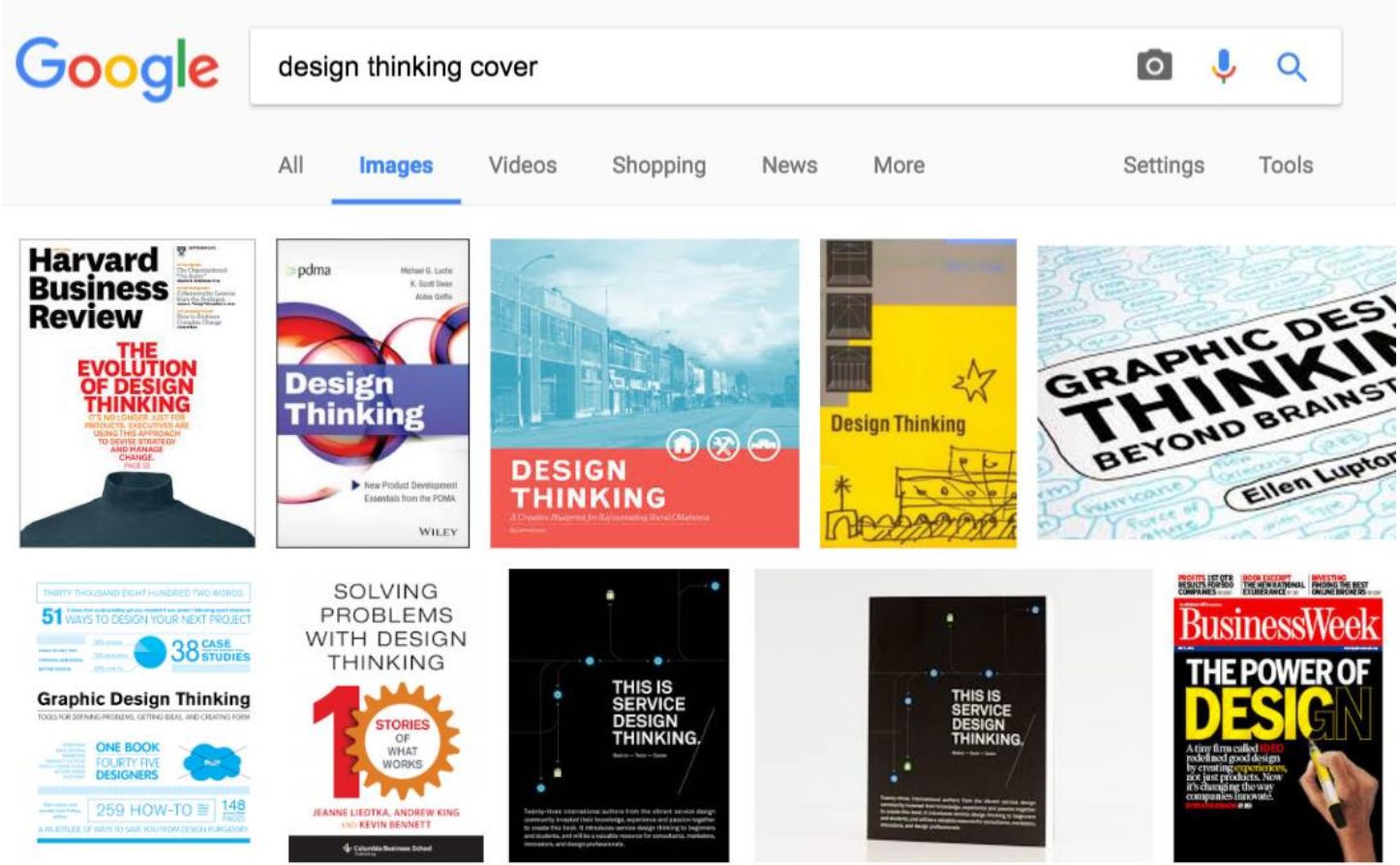
Wharton
University of Pennsylvania

Innovation – OIDD 614
Design Thinking

Professor Karl T. Ulrich
Vice Dean of Entrepreneurship & Innovation

@ktulrich | ktulrich.com | ulrich@wharton.upenn.edu

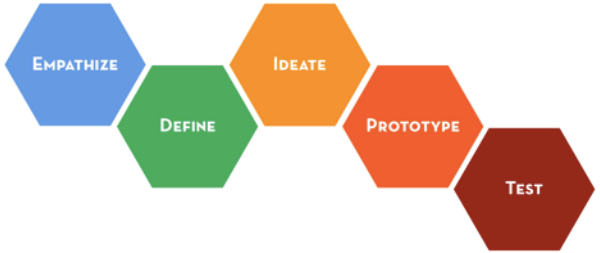


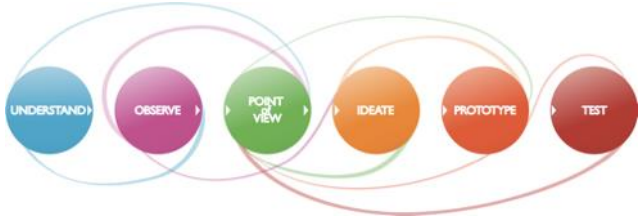
What is “design thinking”?

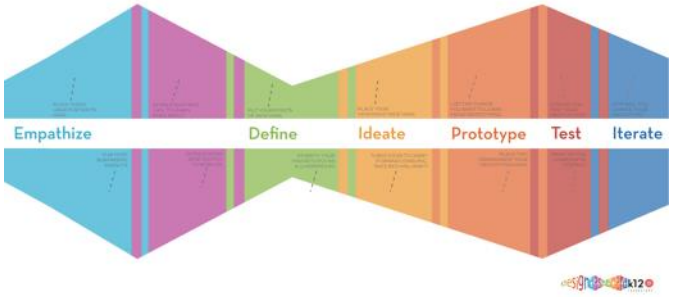
Possibly a reaction to misuse of linear, analytical problem solving processes?
(The stuff that gives business people a bad reputation.)

Wharton
Karl T. Ulrich

Stanford dSchool Process





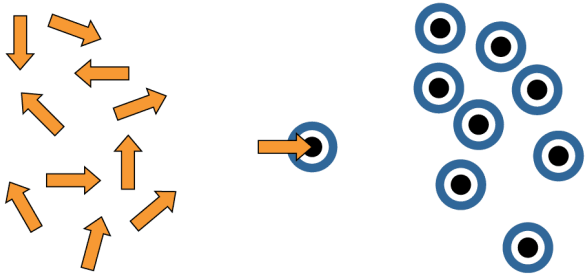


Problem Solving

"All life is problem solving." –Karl Popper

Innovation

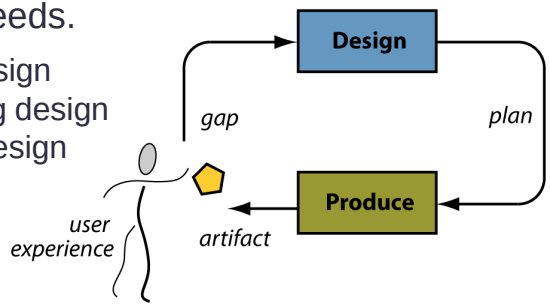
New match solution and need.



Design

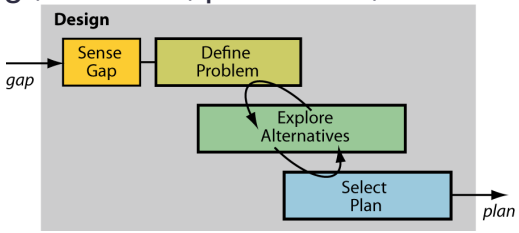
Innovation when pulling from needs.

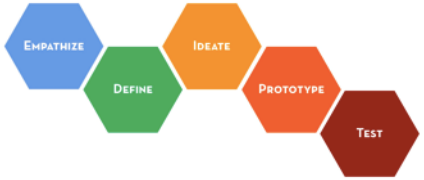
Industrial design	Graphic design
Product design	Engineering design
Landscape design	Furniture design
	etc.



Design Thinking

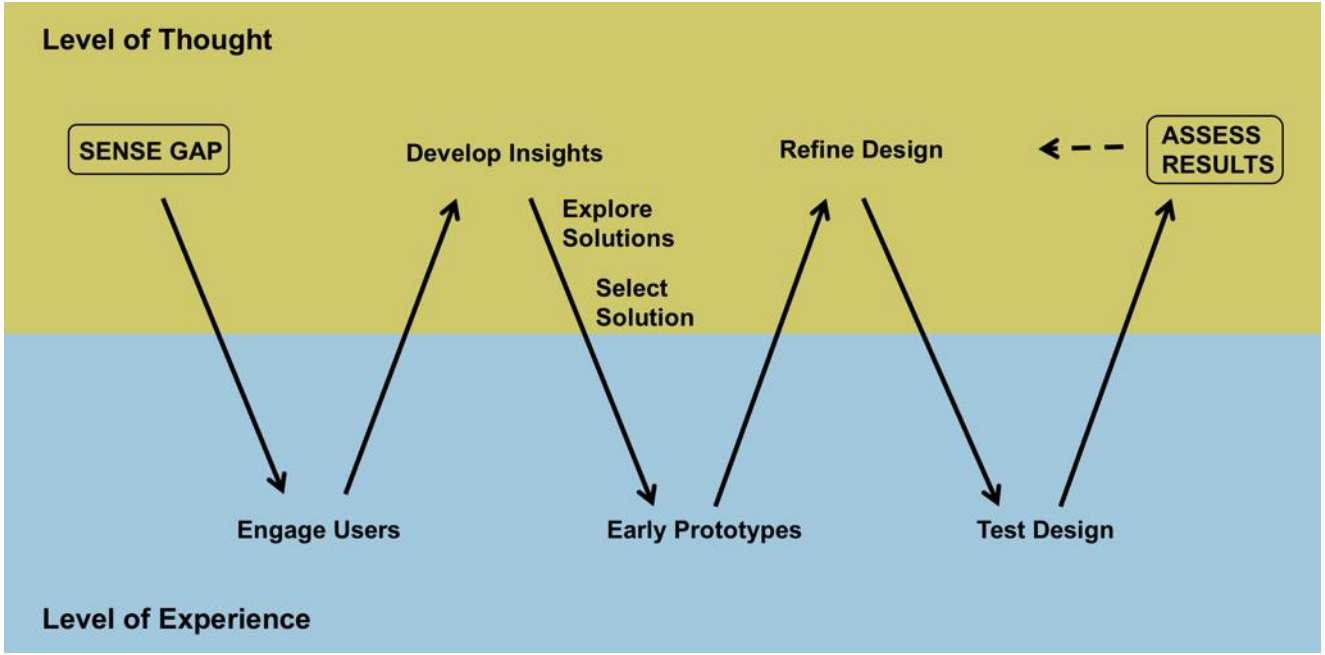
Design process applied to something other than visible artifacts (e.g., services, processes, business challenges).





Wharton
Karl T. Ulrich

Design Process & The W-V Model of Problem Solving



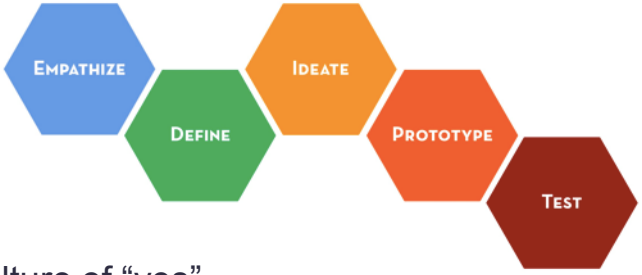
- Emphasizes iterative experiential process.
- Developed and articulated within Total Quality Management movement in 1980s.
- Is “design thinking” just good problem solving process in high-uncertainty environments?

Reference: Shoji Shiba and David Walden, Four Practical Revolutions in Management: Systems for Creating Unique Organizational Capability, 2nd Edition.

Wharton
Karl T. Ulrich

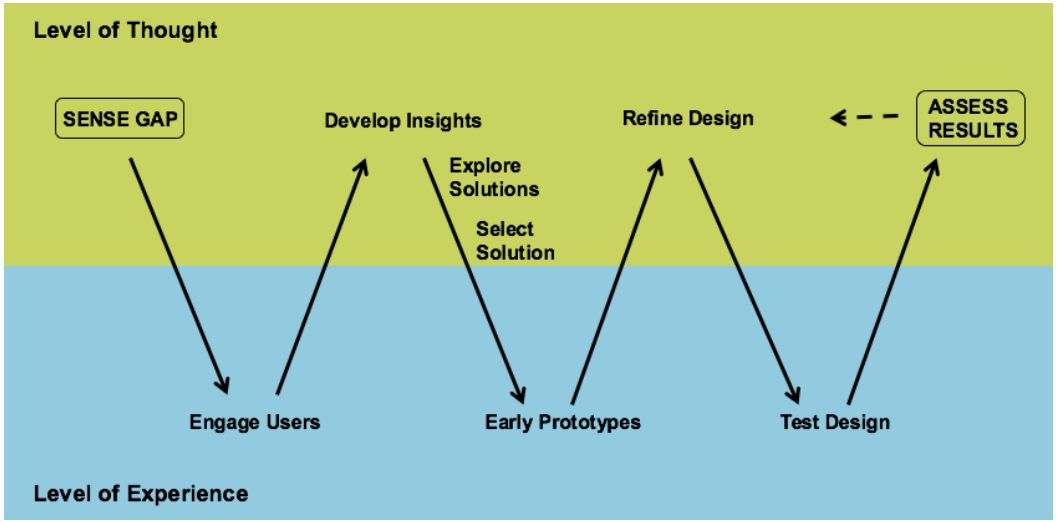
Hallmarks of “Design Thinking”

- 5 Whys – abstracting problem deliberately
- User orientation, focus on empathy
- Observational methods
- Early prototypes
- Iterative refinement
- Visual expression



- Culture of “yes”
- Bias for action

Plus beauty, elegance, craft, and care.



Wharton
Karl T. Ulrich

Workshop Mission

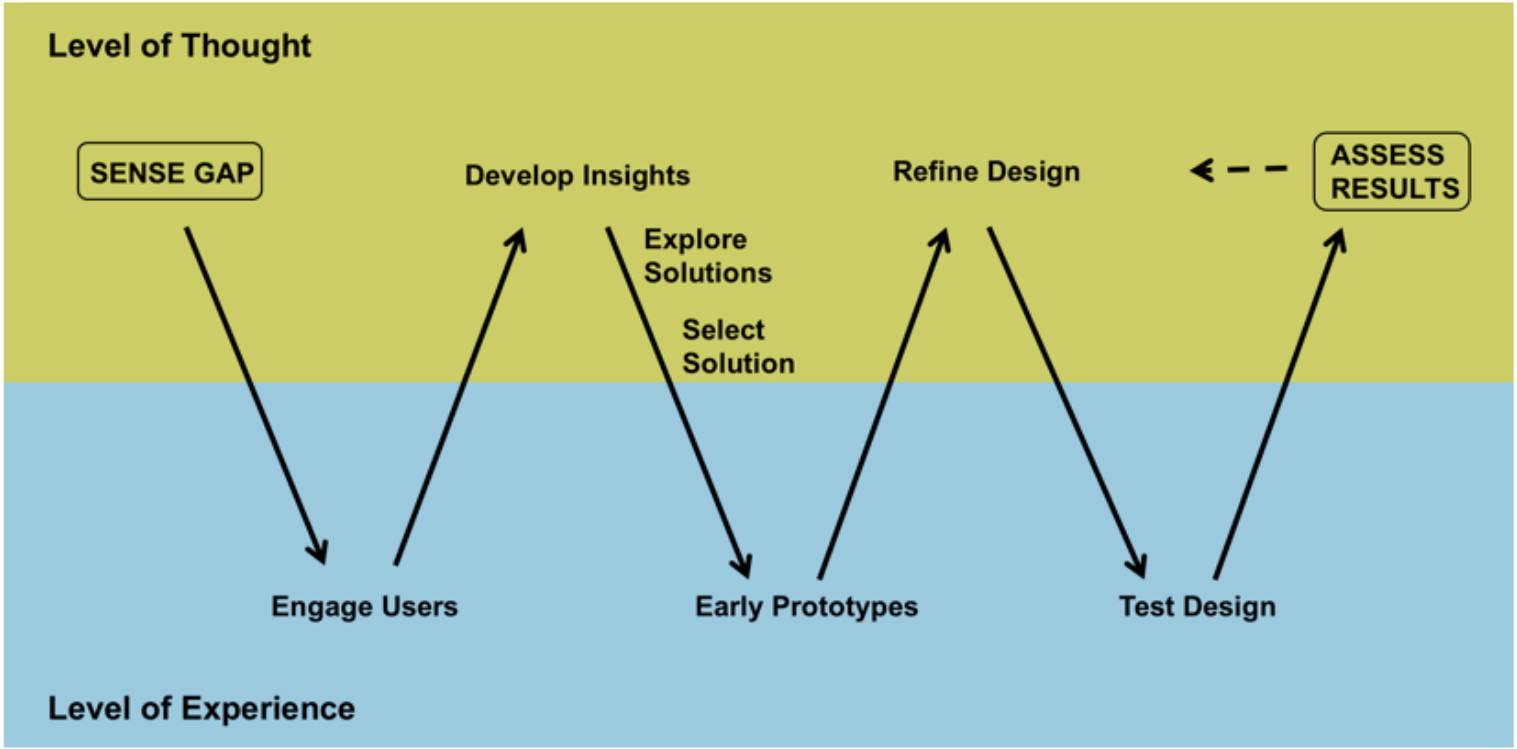
In what way might we…improve the *lunch experience* in campus-like environments?

Beachhead Market: Those studying or working in a semi-public campus environment like a university, office park, or dense urban neighborhood.

Deliverable: As a team of 4, develop and deliver to the market a pitch for your proposed solution, including illustrations and prototype(s) of key elements (with a demo and 60-second pitch).

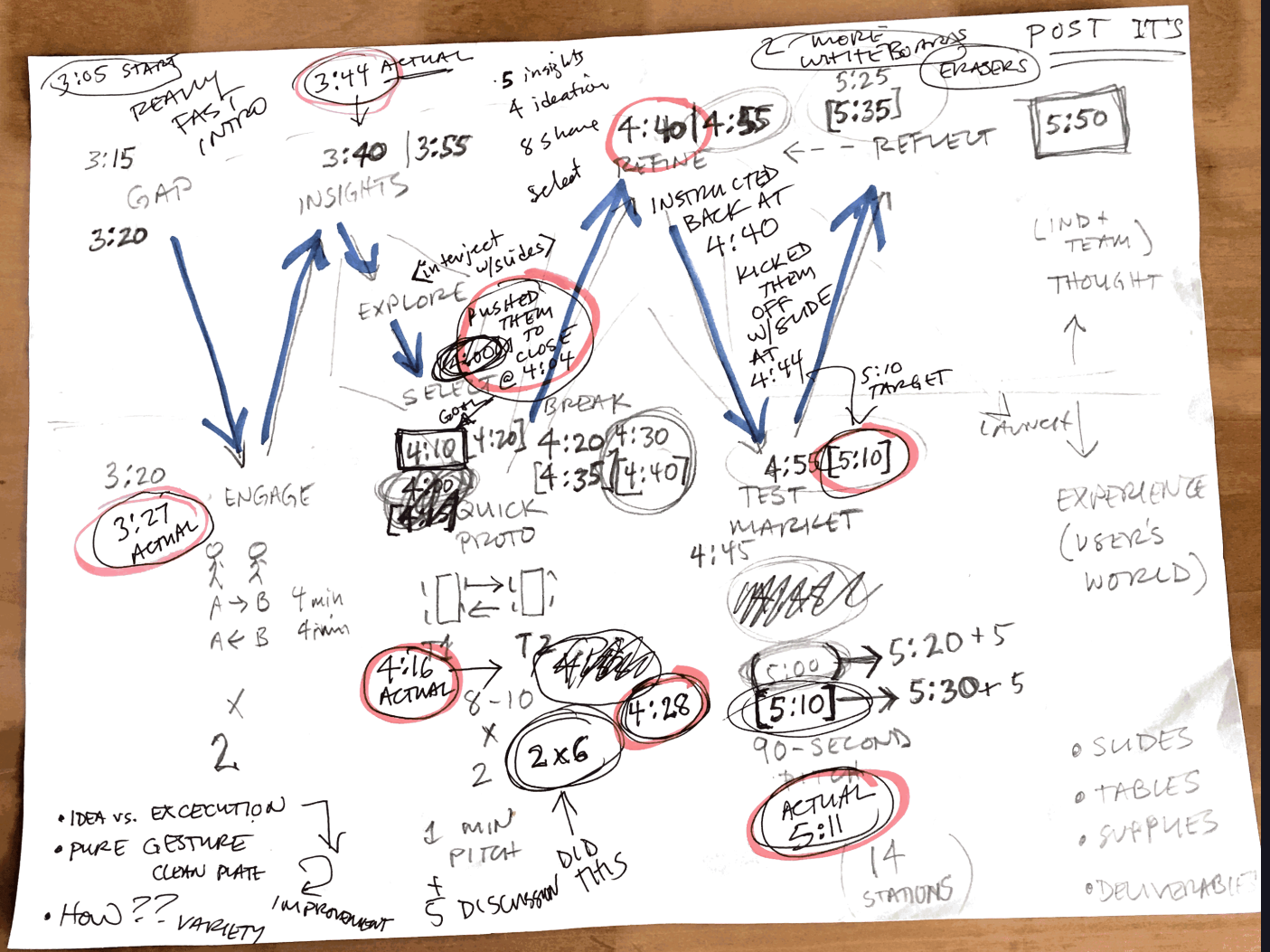
After presentation of the solutions, the target market will be asked to “try/buy” **three** services via voting.

Workshop Process



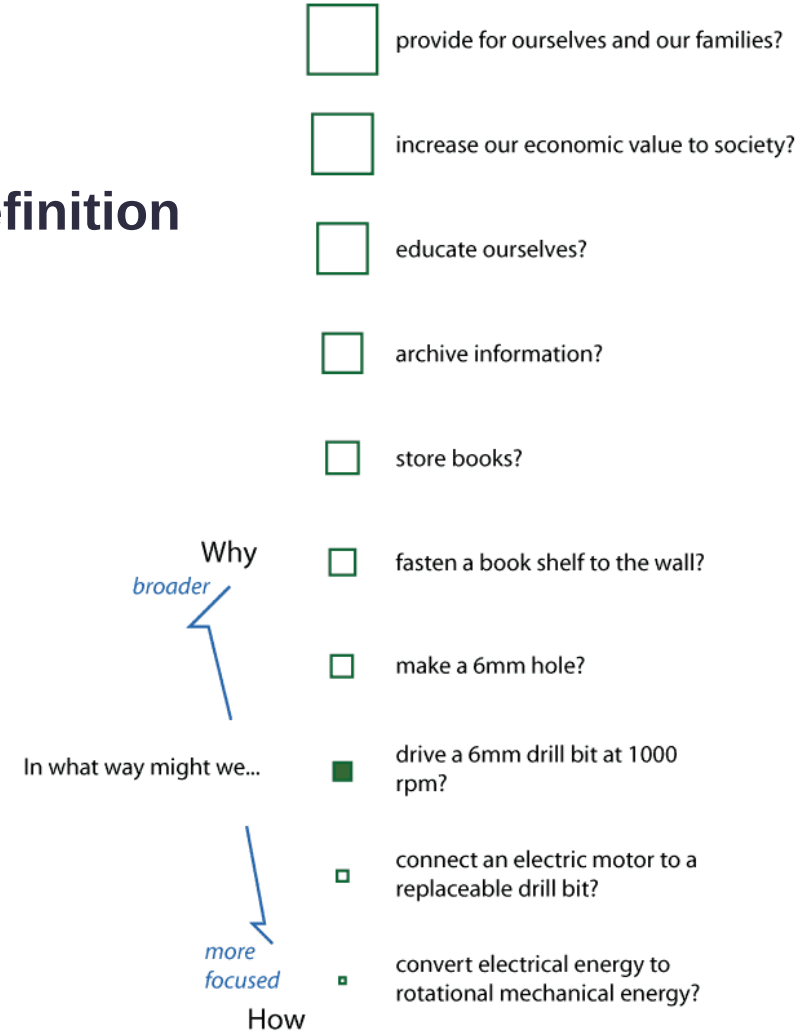
5 whys…	2 cycles of bi-directional 1-on-1 interviews	Individual + Team work	Test sketch prototype with partner team	Team work	Pitch prototype and test market	Debrief

Wharton
Karl T. Ulrich


3:05 START
REALLY FAST INTRO
3:15
GAP
3:20
3:44 ACTUAL
3:40 | 3:55
INSIGHTS
5 insights
4 ideation
8 share
select
4:40 | 4:55
REFINE
2 MORE WHITEBOARDS
ERASERS
POST ITS
5:25
[5:35]
5:50
REFLECT
INSTRUCTED BACK AT 4:40
KICKED THEM OFF W/SLIDE AT 4:44
(IND + TEAM)
THOUGHT
LAUNCH
EXPERIENCE (USER'S WORLD)
5:10 TARGET
3:20
3:27 ACTUAL
ENGAGE
A → B 4 min
A ← B 4 min
X
2
interject w/slides
EXPLORE
PUSHED THEM TO CLOSE @ 4:04
SELECT
Goal
4:10
4:20
BREAK
4:20
[4:35]
4:30
[4:40]
QUICK PROTO
4:16 ACTUAL
T2
8-10
X
2
2x6
4:28
1 MIN PITCH
+5 DISCUSSION
DID THIS
4:45
TEST MARKET
4:55
[5:10]
5:00
5:20 + 5
[5:10]
5:30 + 5
90-SECONDS
ACTUAL 5:11
14 STATIONS
• IDEA vs. EXECUTION
• PURE GESTURE
CLEAN PLATE
• HOW?? - VARIETY
IMPROVEMENT
• SLIDES
• TABLES
• SUPPLIES
• DELIVERABLES

Sense Gap

“5 Whys”
Applied to Problem Definition



Wharton
Karl T. Ulrich

Sense Gap - What problem are we really trying to solve?

Five whys technique (aka what-how ladder, abstraction hierarchy)

In what ways might we…

- Improve the health and wellness of working/studying adults?
- Avoid painful feelings of hunger during the day?
- Meet daily nutritional requirements while out of the house?
- Improve the lunch experience in campus-like environments?
- Procure lunch from local vendors more efficiently?
- Deliver lunch packages reliably to intended recipients?

Wharton
Karl T. Ulrich

Insight from Users (4 min + 4 min) x 2

- Observe; “Show me” and “Tell me.”
- List of key unmet needs, *latent* needs.
- Look for user “bandaids” (solutions users create for themselves).
- Look for an “aha” insight about a need.

A good insight is:

1. Authentic (rooted in your observations)
2. Non-obvious
3. Significant (related to a meaningful opportunity to improve experience)

Wharton
Karl T. Ulrich

Explore Solutions (8 minutes working individually, goal 3-5 solutions)

Independent parallel exploration.

Consider a *single* latent need (your “aha insight”) – consider solutions that focus on that need.

Solutions from analogous domains.

How would Google do it? How would Apple do it? How would Toyota do it?

www.planetbox.com

http://maximus-minimus.com/

Wharton
Karl T. Ulrich

Dabbawalla System in Mumbai

~200,000 meals delivered each day by about 5000 Dabbawallas.

Karl T. Ulrich

Some Solution Strategies

Swiss Army Knife. Do it all for everyone.

Latent Need Pure Play. Identify a latent need – felt but unarticulated – reveal the need and your solution. Don’t clutter the solution with more bells and whistles.

Bowling Pin. Identify a niche and totally address the unmet needs.

Mass Market. Identify the needs of the mass market and deliver a great value, highly functional product, nicely implemented.

Wow Concept. Identify a pain point and deliver a surprising and novel concept.

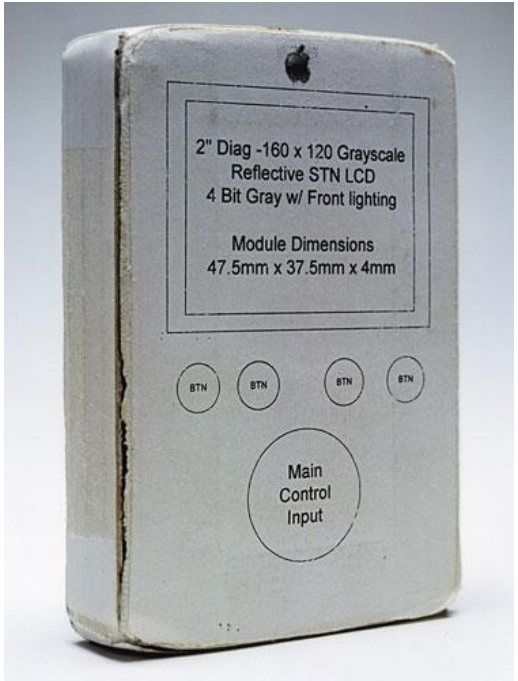
Concept Development (Teams of 4, 10 min)

- Share your solutions with your partners.
- Get some feedback.
- Select one of the concepts for your team to pursue.

Wharton
Karl T. Ulrich

Concept Development - Prototype (Teams of 4, 10 minutes)

- Create a *very quick* sketch and/or prototype(s) of your concept(s).

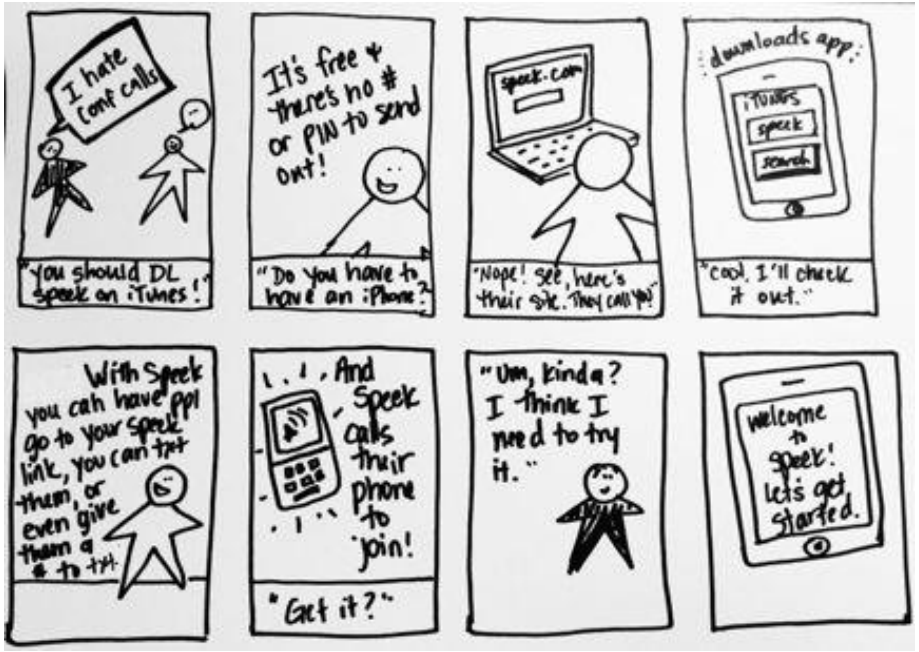


An early prototype of the iPod created by Tony Fadell.

Steven Levy article on origins of iPod. https://www.wired.com/2006/11/ipod/

Wharton
Karl T. Ulrich

Story Boards as Prototypes (usually for services)



Karl T. Ulrich

User Feedback (2 x 5+5 minutes)

- Pair up with another team.
- A show B prototype.
- Get feedback.
- Same for B…
- Repeat with a second team.

Will the dogs eat the dog food?

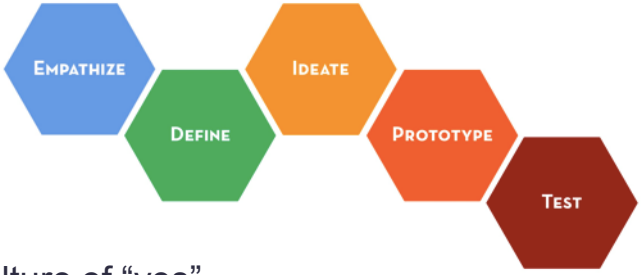
Photo: Maja Dumat - flickr.com, Creative Commons

Final Design and Prototype (15 minutes)

- Refine your concept based on the feedback.
- Build your final prototype to launch in market.
- Deliverables:
  - Name
  - Storyboard proto
  - Ready for 60-second pitch

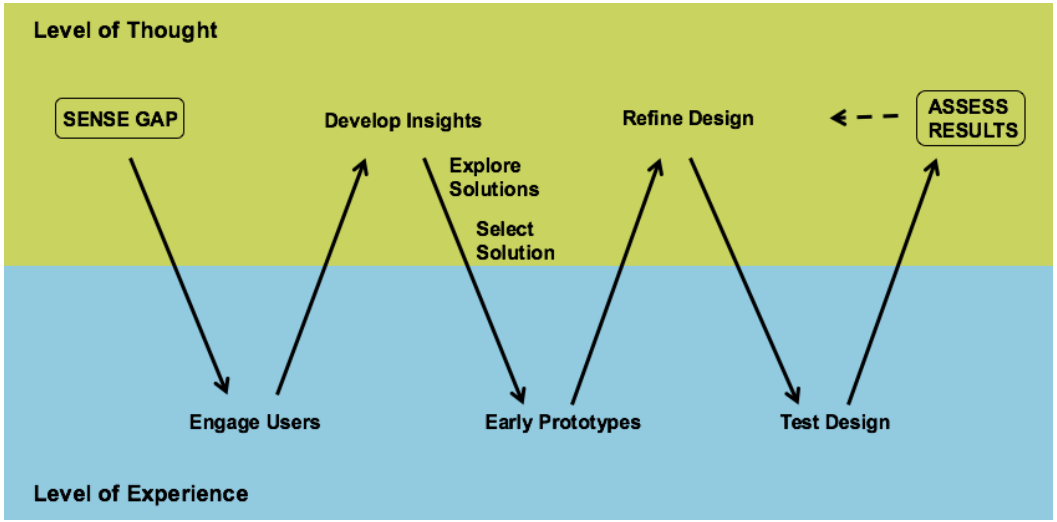
Hallmarks of “Design Thinking”

- 5 Whys – abstracting problem deliberately
- User orientation, focus on empathy
- Observational methods
- Early prototypes
- Iterative refinement
- Visual expression



- Culture of “yes”
- Bias for action

Plus beauty, elegance, craft, and care.



Wharton
Karl T. Ulrich

Learning More

- Core77.com (pretty good general design blog, mostly industrial design)
- Remarkable films (all on Netflix)
  - Objectified (includes some nice Apple stuff)
  - Eames (Ray and Charles Eames – life and work)
  - Helvetica (great overview of graphic design, not just about typeface)
- Stanford dSchool open resources (workshop materials and so forth)
  https://dschool.stanford.edu/resources/
- John Maeda's Design in Tech Report 2018
  https://www.slideshare.net/johnmaeda/design-in-tech-report-2018

- If you're really into this stuff:
  - My Architect (film about Louis Kahn)
  - The Sketches of Frank Gehry (film about Gehry)
  - Design and Thinking (film – I haven't seen it, but plan to soon)