Changing Boeing Culture with Design Thinking

An Iterative, Empathic, Human-Centered Approach to Innovation
Professional – 18 years at Boeing

- After 3 summers as an intern, hired on “for reals” in May of 2000. Started off in software process improvement (CMM/CMMI)
- Spent 10 years as an application developer in Manufacturing & Quality Systems
- Member of the last Lean+ Rotation Program, supporting 737 and Fabrication
- Design Thinking trainer and facilitator

Personal

- Married for 16 years, raising two girls, 13 & 9, both competitive gymnasts
- Attended San Diego State to play baseball. My first hit as an Aztec was a home run against Jeff Weaver (future MLB Star). It was all downhill from there.
Presentation summary

• Introduce you to Design Thinking
• Culture / mindset shifts
• Why it matters
Why should the culture change?

First time quality

Must be emotionally resilient

Capturing the Value of Quality

Enhance talent pipeline

We’re losing

Be better

Do more with less

Leverage innovation

Maintain and extend our competitive advantage
Requirements viewpoints

How the customer explained it
How the project leader understood it
How the engineer designed it
How the programmer wrote it
How the sales executive described it

How the project was documented
What operations installed
How the customer was billed
How the helpdesk supported it
What the customer really needed
What is Design Thinking?

- A methodology for innovation.
- A human-centered approach to developing products, services, processes, and strategy.
- Synthesizes what is desirable with what is technologically feasible and economically viable.
The Design Thinking Process

Experience your end-users in their environment.

Empathize

Generate ideas in a wide solution space.

Define

Build to think! Create a tangible solution.

Ideate

Test your ideas and get user feedback.

Prototype

Test

Construct a shared point of view and a solid problem statement.
The mindset of a Design Thinker – Building creative confidence
Empathize

“Understand the users, from their perspective.”
Empathize Basics

Empathy is the foundation of a human-centered design process. You need to understand the people for whom you are designing in order to better understand their situation.

Focus on Human Values

Be Mindful of Process

Key Phase Activities

Observe: View users and their behavior in the context of their lives.

Engage: Interact with and interview users to understand their challenges.

Discover: Gather inspiration from a wide range of experiences.
Define

“Focus and frame the problem statement.”
Define Basics

The Define Phase is a time to reflect on what you’ve learned and bring clarity and focus to the design process. Frame your opportunities and your users’ point of view based on your findings in empathize mode to create a solution springboard.

Phase Goals

**Identify:** Compelling needs and insights.

**Themes:** Search for meaning and look for patterns.

**Scope:** A specific and meaningful challenge.
Ideate

“We see an opportunity.”
Focus on idea generation, both a large quantity and a diverse range of ideas. Don’t eliminate or judge any idea for feasibility until the brainstorming is finished. Once all ideas are on the table, everyone gets a chance to vote on the best.

Phase Goals

Diversity: Harness the collective perspectives and strengths of your team.

Quantity: Your brainstorming sessions should generate a lot of great ideas.

Turbocharge: Get obvious ideas out of your heads and drive your team beyond them.

Radical Collaboration

Embrace Experimentation
Prototype

“Build to think, and collaborate.”
Prototype Basics

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If a picture is worth a thousand words, a prototype is worth a thousand pictures. Identifying a variable to explore encourages you to break a large problem down into smaller, iterative, testable chunks.

Phase Goals

Quality: Take your ideas to the next level.

Solve disagreements: Prototyping is a powerful tool that can eliminate ambiguity.

Start a conversation: A prototype can be a great way to have different kind of conversation with users.
What can be a prototype?

- Handmade constructions
- Sketches
- Diagrams
- Graphics or pictures
- Skits or role-plays
- Video
- Storyboard
"Will we meet the user's needs?"
Test Basics

Don’t wait until you have a better user interface before showing it to users. If you wait, it will be too late to translate your usability findings into needed changes. How might we make our solution better right now?

Radical Collaboration
Bias toward action
Show, don’t tell

Phase Goals

Iterate: Strive for viability, not perfection.

Move Forward: Do you need to go back to the drawing board, or to implementation?

Business Value: The sooner you have something in your users’ hands, the sooner the business realizes the value.
6 Advantages of Design Thinking

- Better for people—starts and ends with unmet needs
- Takes us beyond having to be an expert
- Builds tangibility—people ‘get it’ with physical prototypes
- Adds momentum to projects
- Reduces risk: fail early and often to succeed sooner
- It’s both a methodology and a mindset
So what?

First time quality

Must be emotionally resilient

Capturing the Value of Quality

Enhance talent pipeline

We’re losing

Be better

Do more with less

Leverage innovation

Maintain and extend our competitive advantage

Don’t Care!!
July & August 2008

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What if you…

✓ Felt connected to your customers?

✓ Saw the value in the work you do?

✓ Felt appreciated by
  • Your users / customers?
  • Your management?
  • Your co-workers?
  • Your company?

✓ Had less stress at work?

✓ Had fun at work?
The Happiness Advantage

- Better secure jobs,
- Better keeping jobs,
- Superior productivity,
- More resilient,
- Less burnout,
- Less turnover,
- Greater sales

(Lyubomirsky, 2005)

http://www.ted.com/talks?q=the+happy+secret+to+better+work&sort=newest
Stressful and disengaged workplace

Stress

- More than $500 billion is siphoned off from the U.S. economy because of workplace stress *
- 550 million workdays are lost each year due to stress on the job *
- 60% - 80% of workplace accidents are attributed to stress *
- More than 80% of doctor visits are due to stress **

Disengagement

<table>
<thead>
<tr>
<th>Disengaged workers have ***</th>
<th>Organizations with low employee engagement scores experience ***</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 37% higher absenteeism</td>
<td>• 18% lower productivity</td>
</tr>
<tr>
<td>• 49% more accidents</td>
<td>• 16% lower profitability</td>
</tr>
<tr>
<td>• 60% more errors and defects</td>
<td>• 37% lower job growth</td>
</tr>
<tr>
<td></td>
<td>• 65% lower share price over time</td>
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* American Psychological Association estimates
** estimate by stress.org
*** Queens School of Business and by the Gallup Organization,
We are moving towards using Design Thinking to make sure we are pushing Design Thinking further to the left.

Currently we are using Design Thinking around or after the start of the project.

Start the Project Right
Enlightened trial and error succeeds over the planning of the lone genius
Signage - Abandon your fear of…

Abandon your fear of...

the messy unknown.
The most creative ideas always come from stepping outside of your comfort zone.

"You have to deal with unexpected findings, with uncertainty and with irrational people who say things that you don't want to hear." - Tom Kelley
Abandon your fear of...

being judged.

Creativity will come easy, if you don’t worry about what others think of you and if you don’t censor yourself too quickly.

We have a better chance of creating innovative solutions, if we all resist the urge to say “that won’t work” before trying it out with our users.
Signage - Abandon your fear of...

Abandon your fear of...

the first step.
Start with the user's needs and their problems will become apparent. Pick one to solve and create a lo-fi prototype.

Rinse, Repeat. Starting a project can be overwhelming. When you break down the steps into smaller, manageable chunks, more successes become guided mastery.
Abandon your fear of...

losing control.

Sometimes you might fail. Sometimes you might not have the best idea. Nurture that confidence to press on.

The more collaborative you are, the more control you share of the project and with increased team diversity comes increased creativity.
Signage - Mindsets

- Focus on Human Values
- Radical Collaboration
- Embrace Experimentation
- Bias toward action
- Show, don’t tell
- Be mindful of Process
- Craft Clarity

Design Thinking is a human centered approach to developing products, services, processes, and strategies. The first step in well armed innovation is to get into the right state of mind.
Signage – Design Thinking Overview

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Empathize to... learn about what your users NEED.

Empathy is the foundation of a human-centered design process. The need to understand the people for whom you are designing in order to better understand their situation.

Interview Guidelines
- Ask good questions
- Make them neutral
- Open ended
- Ask why
- Don’t suggest answers to your Qs
- Encourage specific examples
- Pay attention to what’s not said
- Look for inconsistencies
- Nonverbal cues
- Don’t be afraid of silence

Take notes. Bring a buddy

Interview Reflection Questions
A successful interview will help you answer the following questions:
- What do the users like?
- What do the users dislike?
- What are the user’s goals?
- What are the users’ needs?
- What are the triggers or hurdles for the users?
- What is important to the users?
- What surprised you?

Ideate to... explore a wide solution space.

Focus on idea generation, both a large quantity of ideas and a diverse range of ideas.

Brainstorm Guidelines
- Deliberation – No criticism
- No conversation at a time
- Go for quantity
- Headline
- Build on the ideas of others
- Encourage wild ideas
- Be visual
- Stay on topic

Problem Statement: [Write it out to give your team purpose as you come up with a “How Might We” question]

How Might We... [Create a mind that is broad enough that there are a wide range of solutions but narrow enough that the team has some helpful boundaries]?

Phase Goals
Observe... View users and their behavior in the context of their lives.
Engage... Interact with and interview users to understand their challenges.
Discover... Gather inspiration from a wide range of experiences.

The best solutions come out of the best insights into human behavior...

Define to... synthesize your findings.

Define phase is a time to reflect on what you learned. Here, you need to frame your opportunities and your user’s point of view, based on your findings in empathize mode. The output of this phase is your problem statement aka solution generation springboard.

Define Phase Goals
Identify, compile, needs and insights.
Theme – Search for meaning and look for patterns.
Scope – A specific and meaningful challenge.

Define Methods used:
- Composite Character Profile
- Personas
- Journey Map
- Front of View
- Mindmap to consider:
- Satire and Group
- Extreme Character Profile

Prototype to... make your solution real!

Prototype phase is a time to take your ideas to the next level. Solving disagreements... Prototyping is a powerful tool that can eliminate ambiguity, assist in ideation, and reduce miscommunication. Start a conversation... A prototype can be a great way to have a different kind of conversation with users.

Prototype Phase Goals
Quality – Take your idea to the next level.
Solve disagreements... Prototyping is a powerful tool that can eliminate ambiguity, assist in ideation, and reduce miscommunication.
Start a conversation... A prototype can be a great way to have a different kind of conversation with users.

Prototype Methods used:
- Prototype to test

Test to... ensure user adoption

Test phase is a time to see if your solution is working. Here, you need to test your solution with users to see if it works.

Test Phase Goals
Iterate... A time for viability, not perfection!
Move Forward... Do you need to go back to the drawing board, or to implementation?
Business Value... the sooner you have something in your users’ hands, the sooner the business realizes the value.

Test Methods used:
- Testing with Users
- Feedback Capture Grid
- Like, it works... What if

Methods to consider:
-Storyboarding