

Changing Boeing Culture with Design Thinking

*An Iterative, Empathic,
Human-Centered
Approach to Innovation*

GLOBAL PRODUCT DATA
INTEROPERABILITY
SUMMIT
2016



ELYSIUM

Parker Aerospace

NORTHROP GRUMMAN

BOEING



Ryan Kiggins' Bio

Global Product Data Interoperability Summit | 2016

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

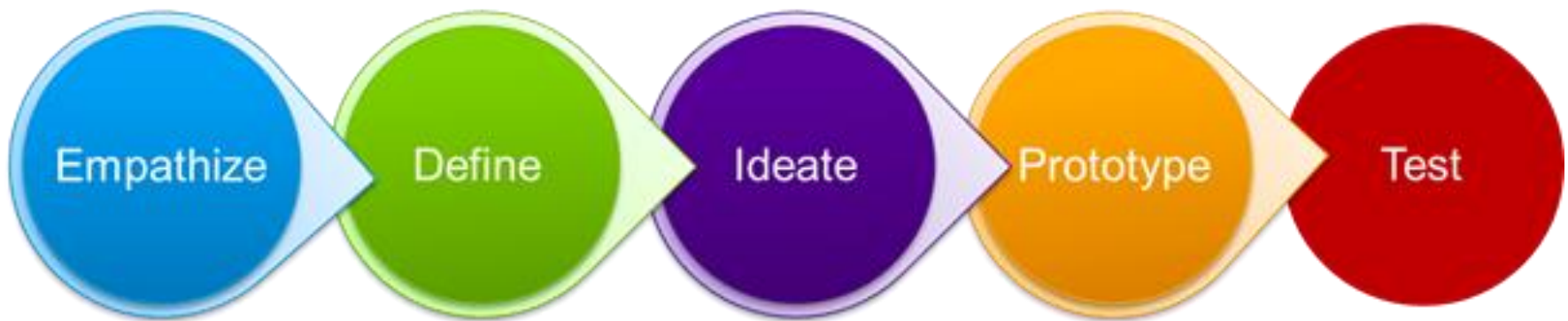
- Married for 16 years, raising two girls, 13 & 9, both competitive gymnasts
- Attended San Diego State to play baseball. My first hit as an Aztec was a home run against Jeff Weaver (future MLB Star). It was all downhill from there.



Presentation summary

Global Product Data Interoperability Summit | 2016

- **Introduce you to Design Thinking**
- **Culture / mindset shifts**
- **Why it matters**



Why should the culture change?

Global Product Data Interoperability Summit | 2016

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

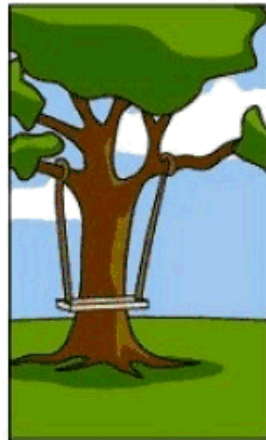
Maintain and extend our competitive advantage

Requirements viewpoints

Global Product Data Interoperability Summit | 2016



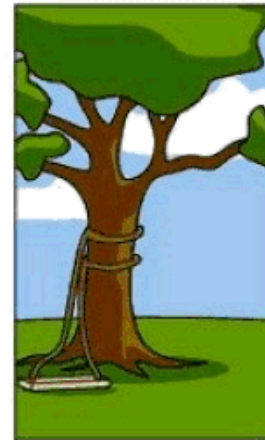
How the customer explained it



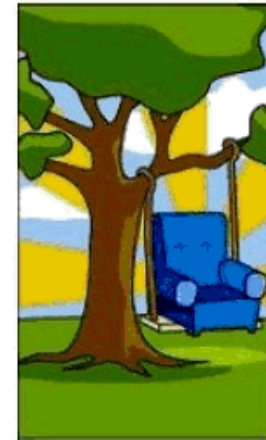
How the project leader understood it



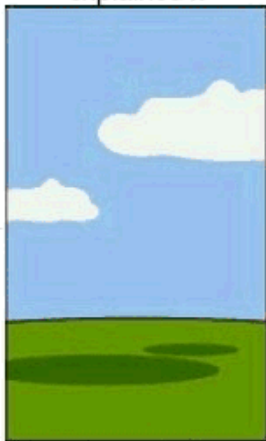
How the engineer designed it



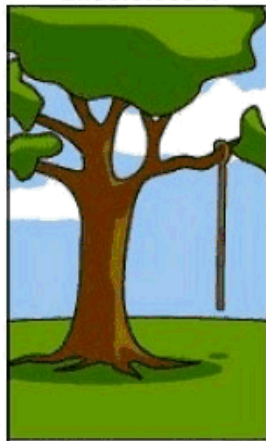
How the programmer wrote it



How the sales executive described it



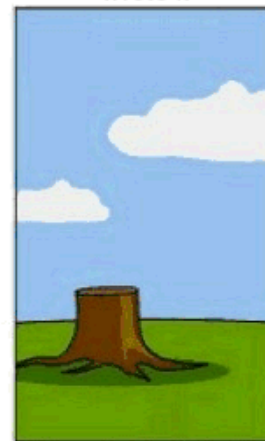
How the project was documented



What operations installed



How the customer was billed



How the helpdesk supported it

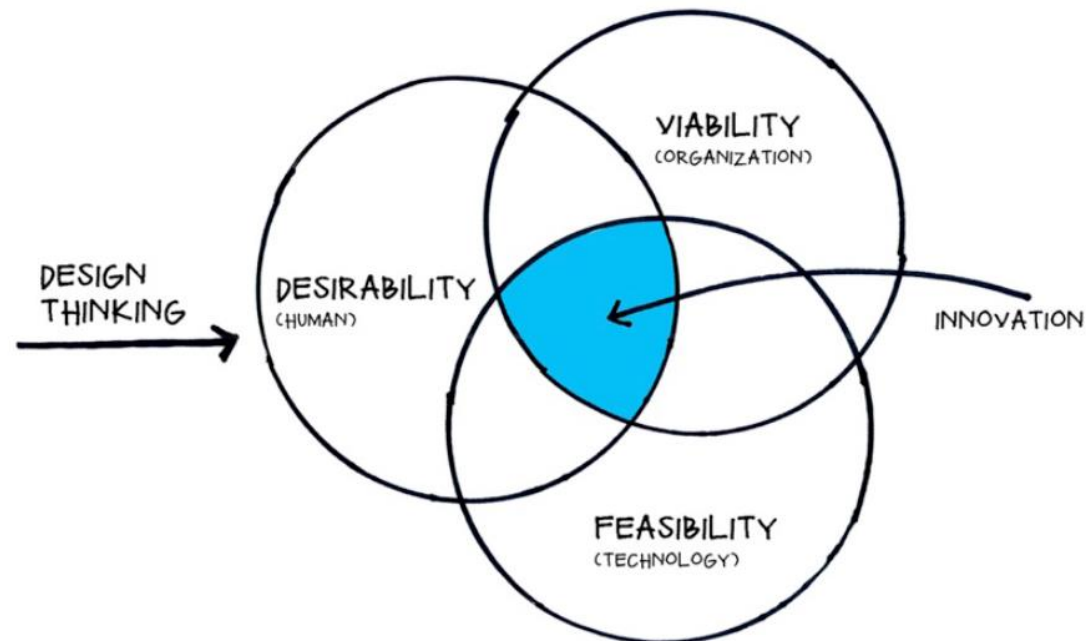


What the customer really needed

What is Design Thinking?

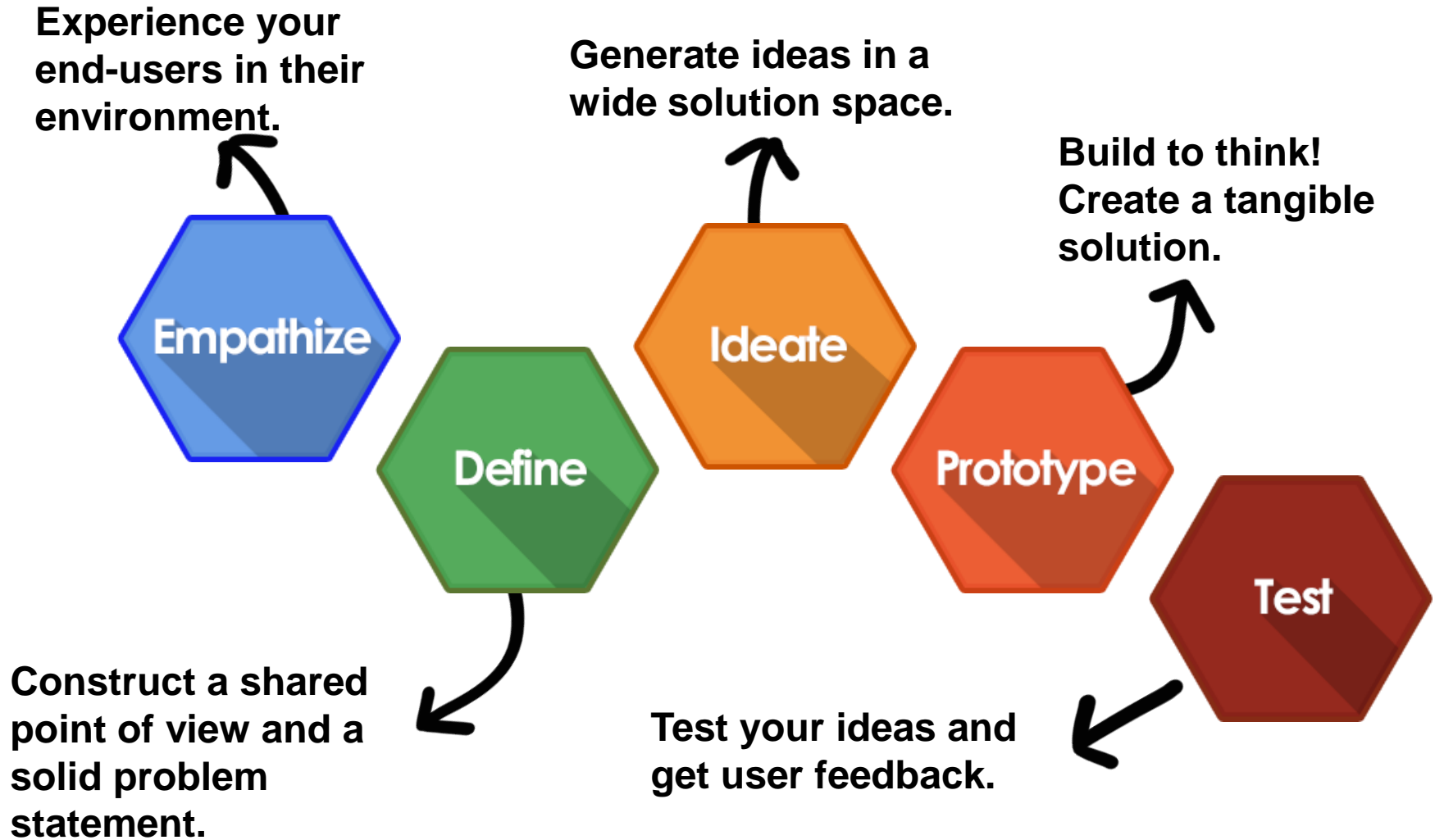
Global Product Data Interoperability Summit | 2016

- 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.



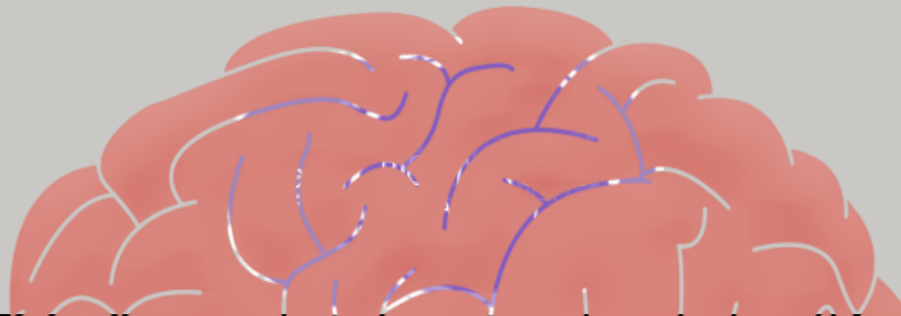
The Design Thinking Process

Global Product Data Interoperability Summit | 2016



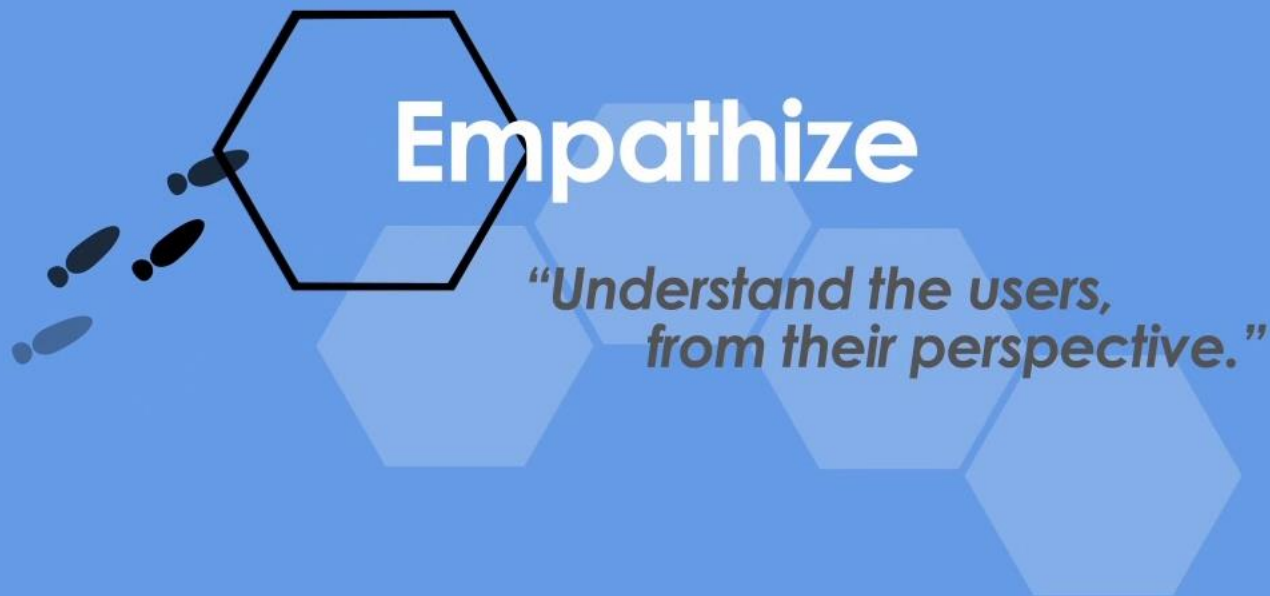
The mindset of a Design Thinker – Building creative confidence

Global Product Data Interoperability Summit | 2016



Empathize

Global Product Data Interoperability Summit | 2016



*"Understand the users,
from their perspective."*

Empathize Basics

Global Product Data Interoperability Summit | 2016

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

Global Product Data Interoperability Summit | 2016



Define

*“Focus and frame the,
problem statement.”*

Define Basics

Global Product Data Interoperability Summit | 2016

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.



Be Mindful of Process



Craft Clarity

Phase Goals

Identify: Compelling needs and insights.

Themes: Search for meaning and look for patterns.

Scope: A specific and meaningful challenge.



Ideate Basics

Global Product Data Interoperability Summit | 2016

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.



Radical Collaboration



Embrace Experimentation

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.

Prototype

Global Product Data Interoperability Summit | 2016



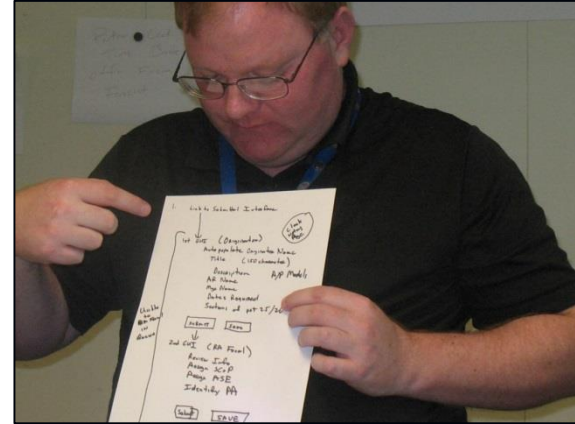
Prototype

*"Build to think,
and collaborate."*

Prototype Basics

Global Product Data Interoperability Summit | 2016

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.



Radical Collaboration



Bias toward action



Show, don't tell

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?

Global Product Data Interoperability Summit | 2016

- Handmade constructions
- Sketches
- Diagrams
- Graphics or pictures
- Skits or role-plays
- Video
- Storyboard

Test

Global Product Data Interoperability Summit | 2016



Test

*“Will we meet,
the user’s needs?”*

Test Basics

Global Product Data Interoperability Summit | 2016

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

Global Product Data Interoperability Summit | 2016

- ✓ 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?

Global Product Data Interoperability Summit | 2016

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!!

2005

Global Product Data Interoperability Summit | 2016



July & August 2008

Global Product Data Interoperability Summit | 2016



What if you....

Global Product Data Interoperability Summit | 2016

- ✓ 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

Global Product Data Interoperability Summit | 2016

- 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

Global Product Data Interoperability Summit | 2016

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

Disengaged workers have ***

- 37% higher absenteeism
- 49% more accidents
- 60% more errors and defects

Organizations with low employee engagement scores experience ***

- 18% lower productivity
- 16% lower profitability
- 37% lower job growth
- 65% lower share price over time

* American Psychological Association [estimates](#)

** [estimate by](#) stress.org

*** [Queens School of Business](#) and by the [Gallup Organization](#).

Pushing Design Thinking further to the left

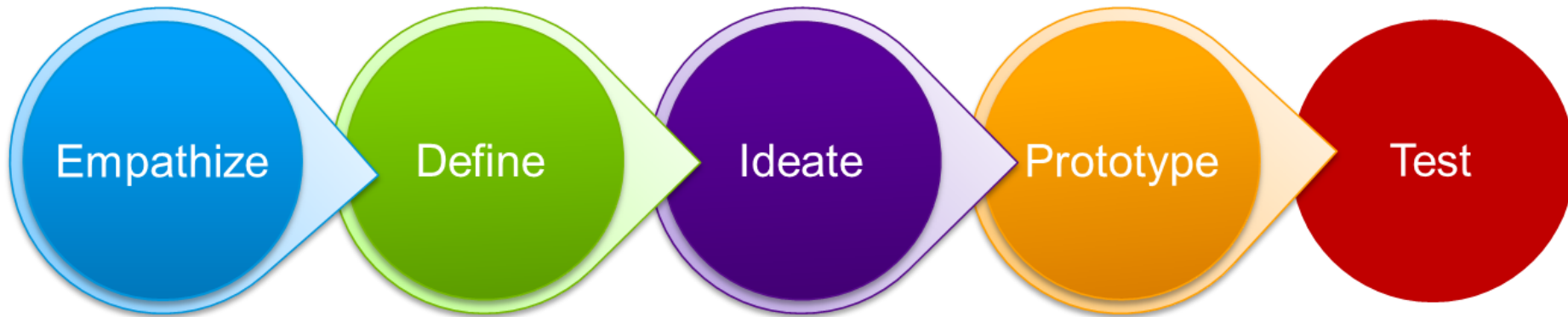
Global Product Data Interoperability Summit | 2016

We Currently we are using Design Thinking around or after /e

Start the Project Right

Summary sentence for Design Thinking


Global Product Data Interoperability Summit | 2016



Enlightened trial and error succeeds over
the planning of the lone genius

Signage - Abandon your fear of...

Global Product Data Interoperability Summit | 2016



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

Boeing, ELYSIUM, Parker, Northrop Grumman, and Boeing are trademarks of Boeing Management Company. © 2016 Boeing. All rights reserved. Copyright © 2014 Northrop Grumman Corporation. All rights reserved. GPDIS_2016.ppt | 29

Signage - Abandon your fear of...

Global Product Data Interoperability Summit | 2016

IT Value Stream Integration

Abandon your fear of...



#designthinking

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.

Copyright © 2015 Boeing. All rights reserved. Harvard Business Review: Reclaim Your Creative Confidence.

Signage - Abandon your fear of...

Global Product Data Interoperability Summit | 2016

IT Value Stream Integration

Abandon your fear of...



#designthinking

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.


Copyright © 2015 Boeing. All rights reserved. Harvard Business Review: Reclaim Your Creative Confidence.

Signage - Abandon your fear of...

Global Product Data Interoperability Summit | 2016

IT Value Stream Integration

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.

Copyright © 2015 Boeing. All rights reserved. Harvard Business Review: Reclaim Your Creative Confidence.

Signage - Mindsets

Global Product Data Interoperability Summit | 2016



Signage – Design Thinking Overview

Global Product Data Interoperability Summit | 2016

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

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.

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 user's needs?
- > What are triggers or hurdles for the users?
- > What is important to the users?
- > What surprised you?

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.

Methods used:

- ☐ Interview for Empathy

Methods to consider:

- ☐ Empathy Map

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

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

- > Defer Judgment - NO blocking
- > One 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 seed that is broad enough that there are a wide range of solutions but narrow enough that the team has some helpful boundaries.]

Phase Goals

Diversity... Harness the collective perspectives and strengths of your team.
Quantity... your brainstorming sessions should generate a lot of good ideas.
Turbocharge... Get obvious ideas out of your heads and drive your team beyond them.

Methods used:

- ☐ How Might We...
- ☐ Brainstorming
- ☐ Selection

Methods to consider:

- ☐ Stoke

Test to... ensure user adoption

Team Prototype Test

Procedure:

1. Let your user experience the prototype.
2. Have them talk through their experience.
3. Actively observe.
4. Follow up with questions.

Methods used:

- ☐ Testing with Users
- ☐ Feedback Capture Grid
- ☐ I like, I wish... What if

Methods to consider:

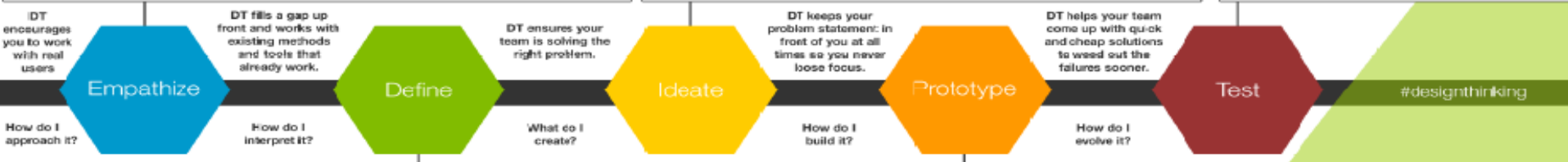
- ☐ Storytelling

How might we make our solution even better?

Like + Dislike
Qs ? Add on ideas

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 user's hands, the sooner the business realizes the value.



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.

Phase Goals

Identify... compelling needs and insights.
Themes... Search for meaning and look for patterns.
Scope... A specific and meaningful challenge.

Methods used:

- ☐ Composite Character Profile
- ☐ Persona Composite
- ☐ Journey Map
- ☐ Point of View

Methods to consider:

- ☐ Saturate and Group
- ☐ Extreme Character Profile

Prototype to... make your solution real!

Manage the solution-building process. Identifying a variable to explore encourages you to break a large problem down into smaller, testable chunks.

Phase Goals

Quality... take your ideas 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.

Methods used:

- ☐ Prototype to Decide

Methods to consider:

- ☐ User-driven prototype
- ☐ Prototype to Test
- ☐ Wizard of Oz prototyping

Questions / Discussion

Global Product Data Interoperability Summit | 2016