Creating a Successful Lessons Learned Approach: People, Process, Culture

Dr. Edward J. Hoffman
Knowledge Engagement
PMI, Strategic Advisor
Columbia University, Executive in Residence
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Workshop Objectives:

Engage NSF practitioners in establishing a home grown process for learning from science projects

Create and promote a learning culture of reflective and sharing practitioners

Consider methods for establishing an engaging and effective lessons learned system that is practitioner useful and friendly

Enjoy sharing knowledge and conversation among NSF professionals

“A story to me means a plot where there is some surprise. Because that is how life is - full of surprises.”

Isaac Bashevis Singer

Learning from Failure

Challenger accident

1986

Mars failures

1999

Columbia accident

2003

"...fundamental weaknesses in the collection and sharing of lessons learned agency-wide."
GAO

NASA's current organization...has not demonstrated the characteristics of a learning organization.
Columbia Accident Investigation Board

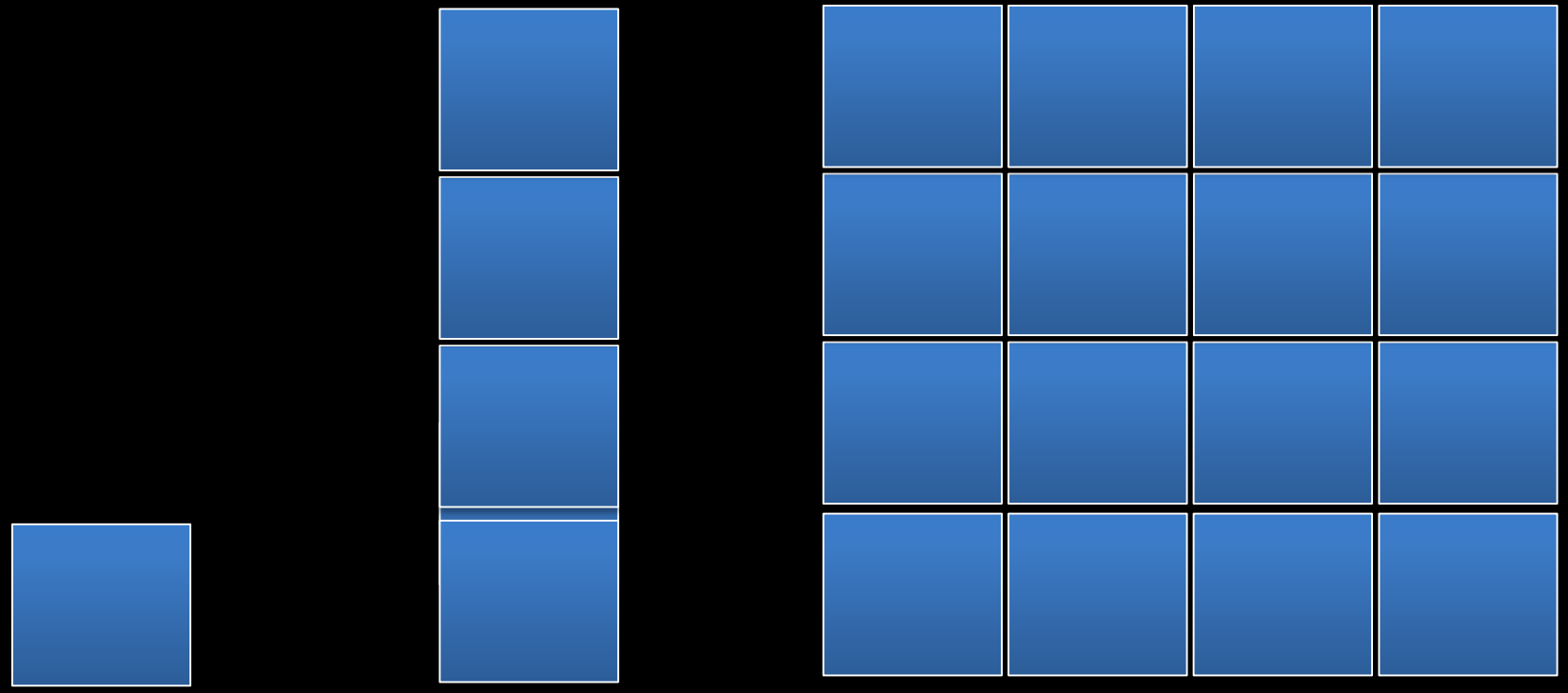
How Can Practitioners Share Stories?

- Examples of venues for stories that help promote a culture of sharing and openness
  - Masters with Masters: Expert practitioners and leaders sharing stories in facilitated dialogue with each other.
  - Knowledge Forums: Practitioner stories on specialized topics (e.g., lessons from the Space Shuttle, green engineering, lessons for Principal Investigators)

Key Assumptions and Biases

- Practitioners know best.
- 85-90% of learning takes place on the job.
- Learning is contextual — different career stages have different requirements.
- Optimal performance and learning come together at the team level.

Levels for Learning



INDIVIDUAL TEAM ORGANIZATION

Venues for Stories at NASA

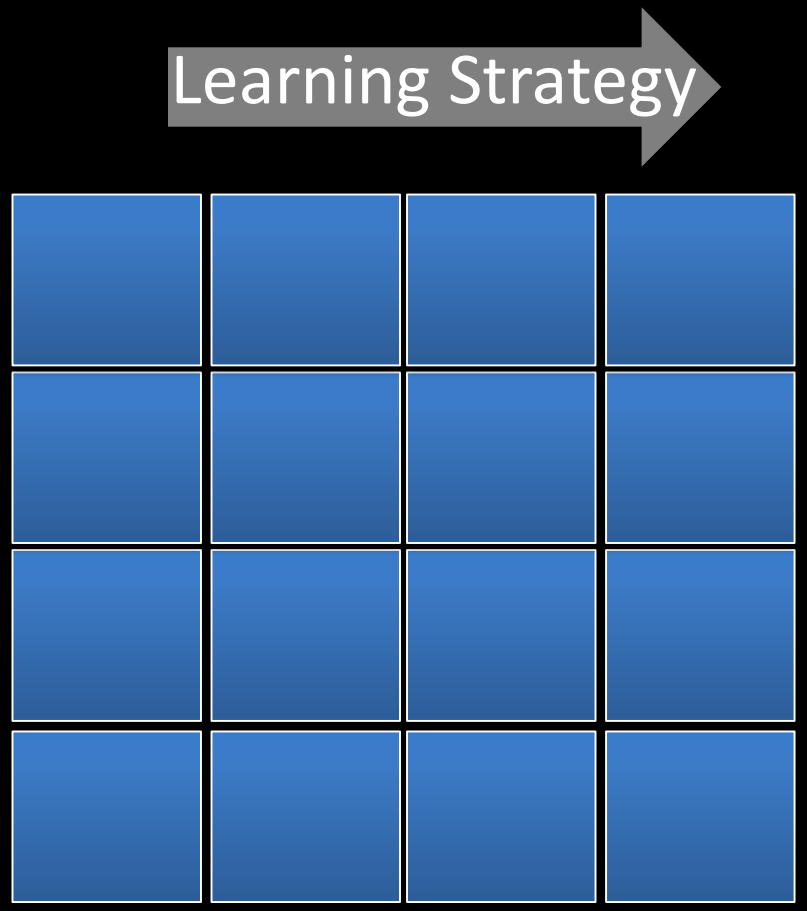
- Agency-wide Forums
- Masters with Masters
- Local events

How Do People Learn from Project Stories?

Example: former astronaut and NASA Chief Safety Officer Bryan O'Connor's lesson from the Challenger accident.

Stories are essential because they can convey context, emotion, and perspective.

- Transmit institutional memory from veterans to emerging leaders.
- Build a common understanding.
- Explore and learn from past decision points that led to successes or failures.
- Develop a community of reflective practitioners.



Knowledge Sharing

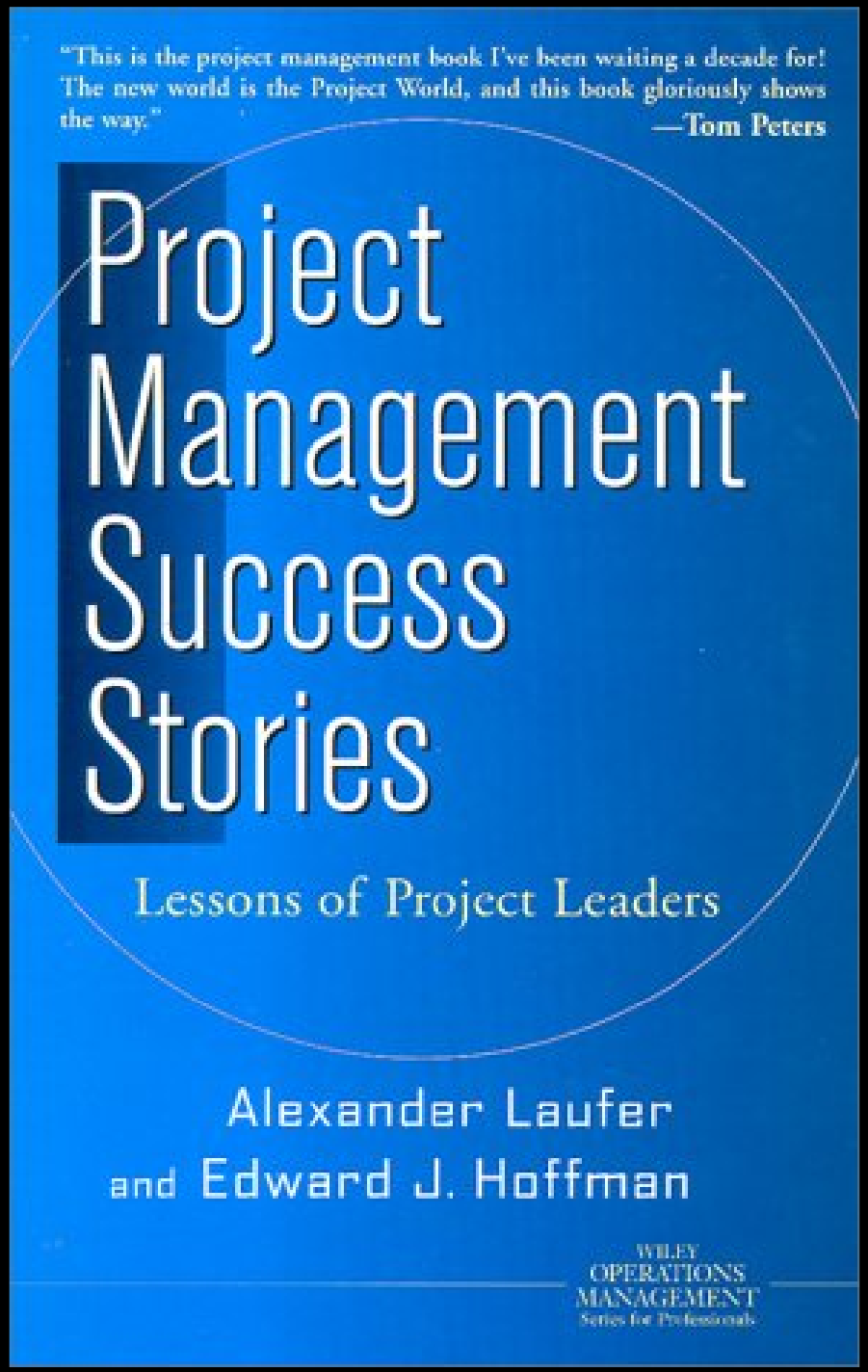
- Live forums for sharing stories
- Case studies and publications
- Online tools for sharing (websites/portals, YouTube, social media)
- Defined processes for identifying, capturing and sharing knowledge
- Knowledge networks (e.g., communities of practice

Storytelling helps us construct a sense of *dignity, meaning, and purpose* for our work.

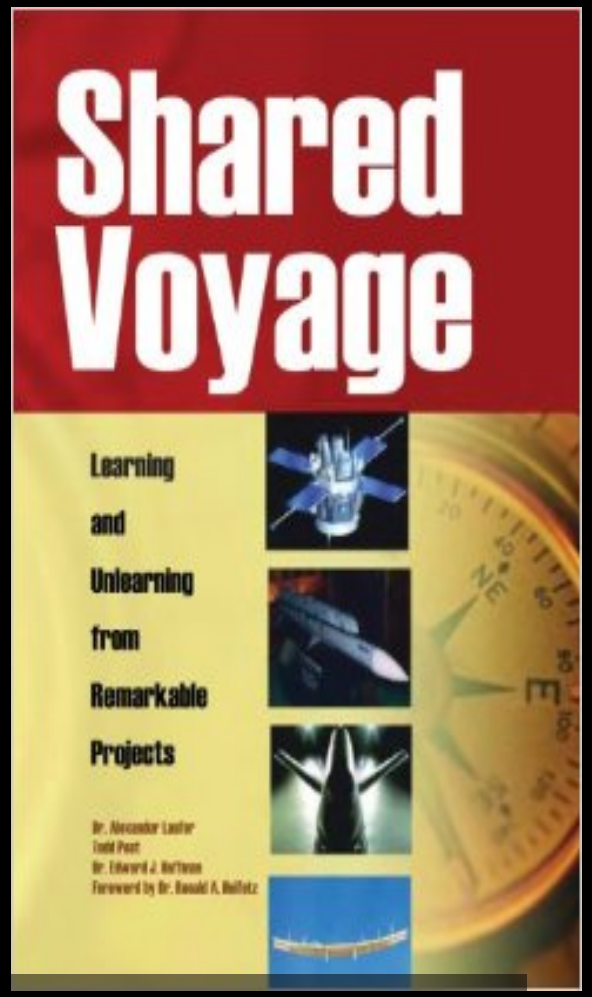
Whatever has a value can be
replaced by something else
which is equivalent;
whatever, on the other hand, is
above all value, and therefore
admits of no equivalent,
has a dignity.

- Immanuel Kant

Project Management Lessons of Leaders



Why Stories?



- Project stories that go untold are missed opportunities for learning.
  - Government-wide requirements call for foundational training for project managers.
  - Failures will happen; we need to learn from them.
  - Successes also have valuable lessons and best practices.

- What Successful Project Managers Do (MITSloan Management Review Laufer, Hoffman, Russell, Cameron Spring 2015)

A Good Story…

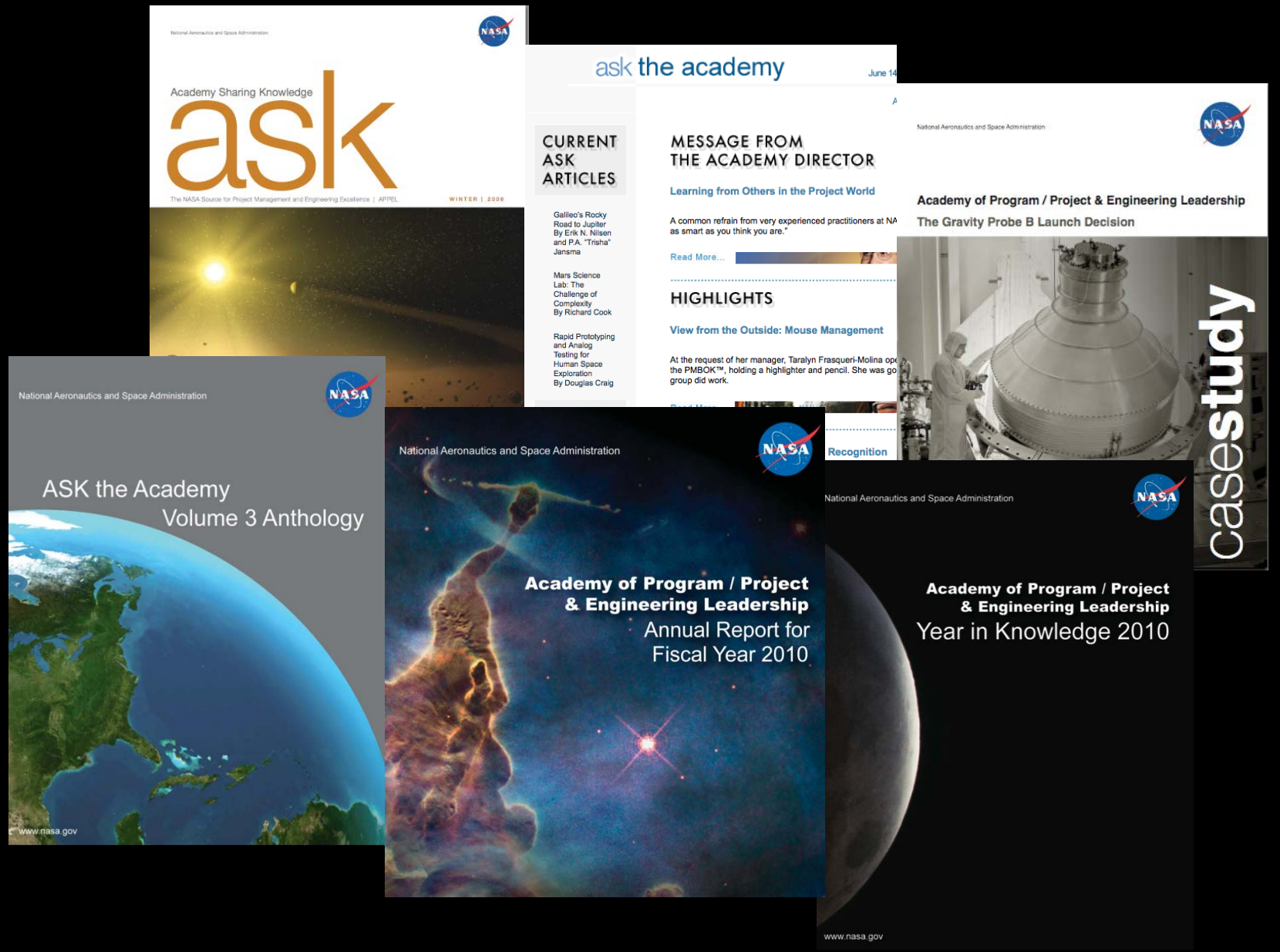
…starts with a problem, conflict, or challenge.

…describes a unique experience.

…describes concrete actions by people.

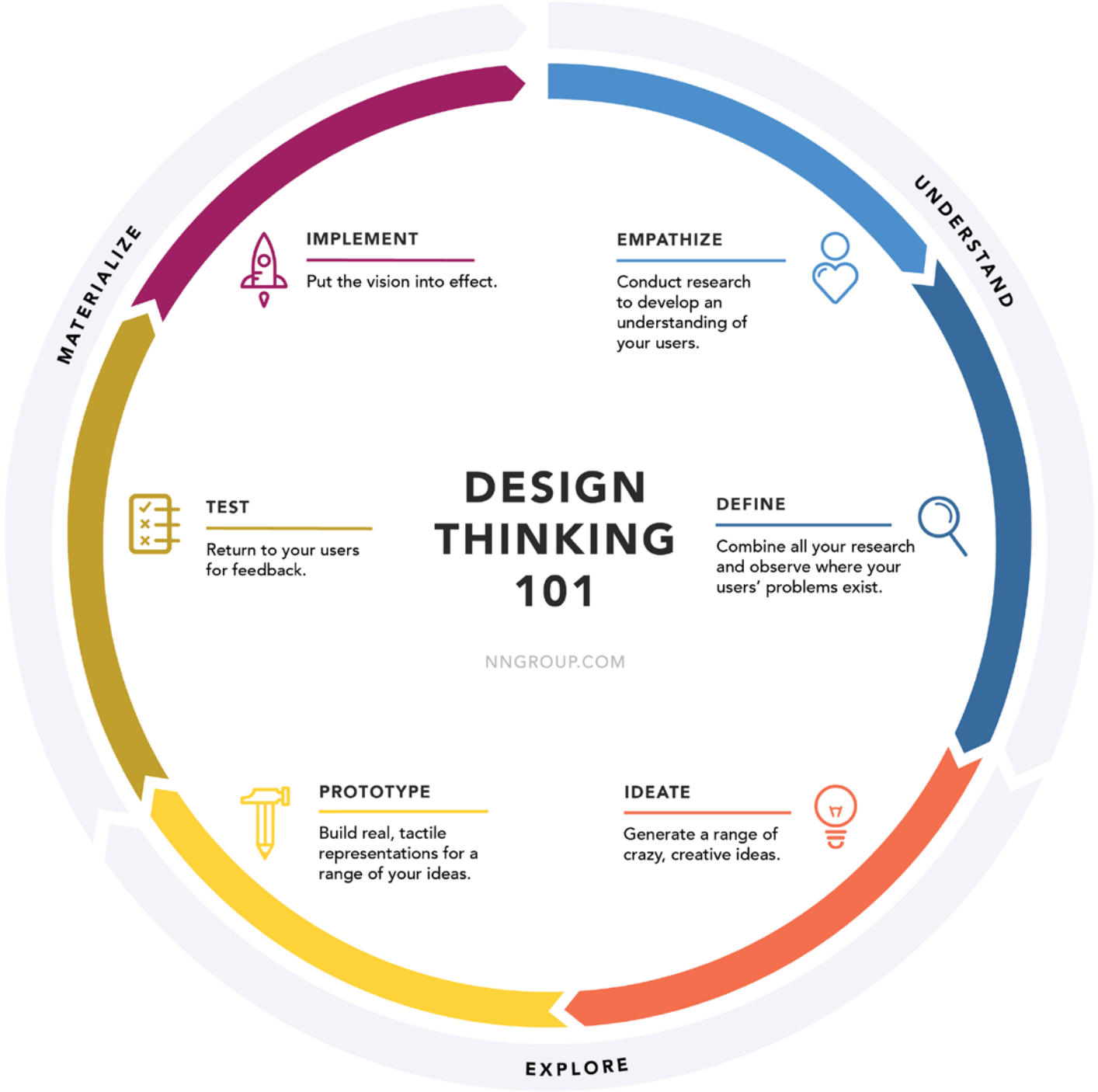
…makes a point — arrives at some basic truth.

Types of Stories: Publications



“**Design thinking** is a human-centered approach to innovation that draws from the designer's toolkit to integrate the needs of people, the possibilities of technology, and the requirements for business success.”

— Tim Brown, president and CEO, IDEO.


MATERIALIZE
UNDERSTAND
EXPLORE
IMPLEMENT
Put the vision into effect.
EMPATHIZE
Conduct research to develop an understanding of your users.
TEST
Return to your users for feedback.
DESIGN THINKING 101
NNGROUP.COM
DEFINE
Combine all your research and observe where your users' problems exist.
PROTOTYPE
Build real, tactile representations for a range of your ideas.
IDEATE
Generate a range of crazy, creative ideas.

Design Thinking Activity:

Design for a successful and formal process of learning from science projects

Designing a Successful Learning Process

1. EMPATHIZE: Groups gather information through conversation and personal examples to develop a deeper understanding of the customer and the challenge.

2. DEFINE: Each Group defines and clearly articulates the problem they want to solve.

3. IDEATE: Ideas are generated by each Group in an attempt to inform the problem in terms of possible solutions.

4. PROTOTYPE: Each Group creates quick representations and models of the top ideas, emphasizing the graphical representation approach for better understanding.

5. TEST: Each Group briefs the other Groups on their new concept in a way that can be best integrated into their business culture and is then refined according to feedback.

The Question

1. How can the NSF Large Facilities Science Projects, consistently and more formally learn from project missions, so that we are more adaptive, capable, and excellent organization?

Your Mission: Develop a great practice for formal and consistent learning from science projects

1. Empathy: Interview your group (10 minutes)

Share stories of how learning happens at NSF.

Take notes of the storyteller.

Gain empathy for the person telling the story.

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2. Empathy: Dig Deeper (10 minutes)

After the first set of stories about learning from science projects, follow up on things that intrigue you.

Dig for stories, feelings, and emotions.

Ask ‘Why?’

Your Mission: Develop a great practice for formal and consistent learning from science projects

3. Define – Capture Findings & Take a Stand

Capture findings by collecting the group thoughts and reflect on what you have learned.

Synthesize your learning into two groups:

-Use verbs to express goals and wishes

-”Insights” are discoveries that might promote solutions

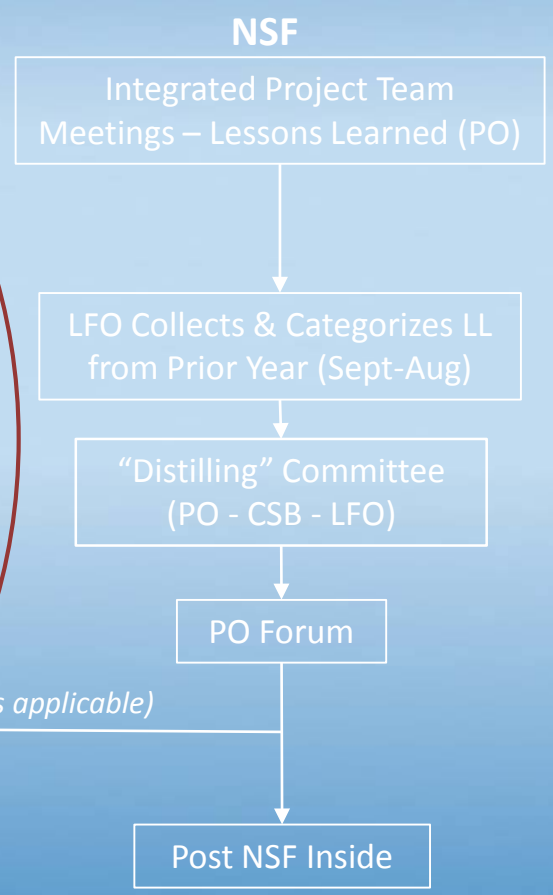
Take a stand by selecting the most compelling goal and most interesting insight to articulate a problem statement…

LL Program Feedback – 3 Phases

Focus – maximum benefit, minimum burden

- Reporting
  - Annual Review Requirement to Report Lessons Learned (LL)
  - Discussed with the Review Panel or Separate Report to Program?
- "Distilling"
  - Are Recipients willing to participate on Committee?
  - Should Program Officers be on Committee?
  - What evaluation criteria
  - Charge to the Committee
- Sharing – Efficient and effective manner

Large Facilities – Proposed Lessons Learned Program



(As applicable)

Annual Timeline

Continuous
↓
September
↓
October - December
↓
February
↓
May
↓
June

Potential Lessons Learned Categories

What categories most beneficial to share between Large Facilities?

Recipients

- Proposal Development
- MREFC Process
- User Management
- Cyberinfrastructure
- Operations
- Maintenance

NSF

- Budget
- Solicitation Development
- Proposal Review
- External Panels

Your Mission: Develop a great practice for formal and consistent learning from science projects

4. Ideate: generate alternatives to test (15 minutes)

Sketch at least 5 radical ways to solve your problem statement.

Write your problem statement and list 5 radical ideas

Share your solutions & capture feedback

Your Mission: Develop a great practice for formal and consistent learning from science projects

5. Prototype: share and discuss (10 minutes)

Share your solutions & capture feedback

Your Mission: Develop a great practice for formal and consistent learning from science projects

6. Test and Iterate: reflect & generate a new solution (10 minutes)

Sketch your big idea, note details if necessary!

Questions

edhoffma@gmail.com
ejh82@columbia.edu

Linked In:
https://www.linkedin.com/in/ed-hoffman-5033554