

# Knowledge and Narrative

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Knowledge 2020

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# Stories are valuable knowledge-sharing mechanisms. But why?

- Stories provide context
- Stories reveal process
- Stories emphasize the human element
- Stories are sensemaking

# Context

- Neil DeGrasse Tyson: “Often the ‘why’ isn’t, ‘Here’s the answer.’ The ‘why’ is, ‘Here’s the landscape in which this activity is unfolding.’”

# Technical Context: The Atlas Centaur failure

March 26, 1987: a warm, cloudy day at KSC

Launch criteria include: “The flight path of the vehicle should not be through middle-level cloud layers 6,000 feet or greater in depth, when the freezing level is in the clouds.”

# Technical Context: The Atlas Centaur failure

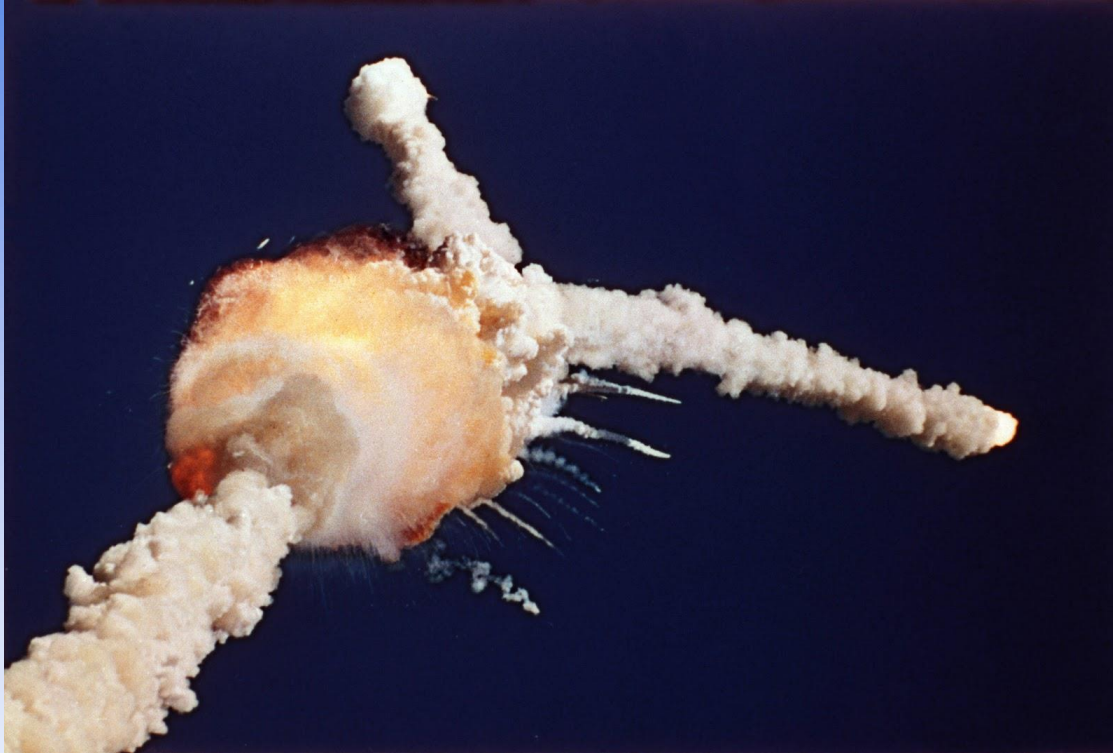


# Technical Context: The Atlas Centaur failure



Apollo 12: November 14, 1969  
**The missing info:** Induced lightning

## Organizational Context: *Challenger*



**Proximate cause:** O-rings turn brittle in cold weather.

# Organizational Context: *Challenger*

Organizational **Root causes** revealed by the story of what happened:

- Schedule pressure
- Distance/poor communication among team members
- Preconceptions about engineering “proof”

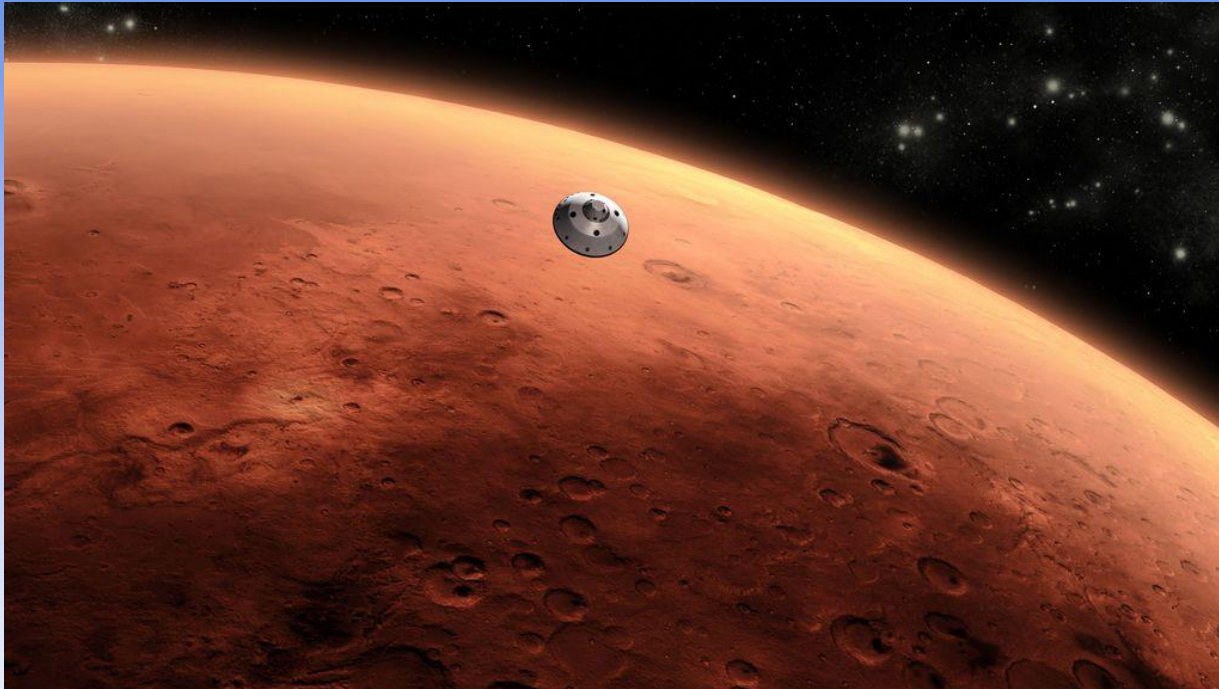


# Process

Failure and success are the outcome of a chain of events: not only “what” but “how.”

Stories are built of chains of cause and effect: “A led to B, which led to C:”

# Process: MSL (*Curiosity*)



How did they make the “sky crane” EDL technology work?

# Process: MSL Sky Crane

- Experience
- Documentation of earlier missions
- Board of skeptics
  - Rounded up skeptics from Viking, Apollo, *et al.*
  - “To make sure we’re not all drinking the Kool-Aid together.”  
(Rob Manning)
  - Three meetings over more than two years

# Process: *Pathfinder*

The story shows:

- How to find new ideas
- How social networks work
  - “ I told my friend Miguel San Martin, ‘I need to get Doppler radar on the vehicle to measure velocity.’ He puts two fingers up and says, ‘Give me two pictures.’ I said, ‘Oh my God, what a brilliant idea. Who should I talk to?’ He says, ‘Call Andrew Johnson. He does two-dimensional image correlation algorithms.’” (Manning)

# The Human Element

Documentation often leaves people out.

Stories are human centered: a “hero” facing a challenge, making choices, acting.

- Demonstrate values, determination, resourcefulness, courage
- Inspire action through identification

# Human Element: Kim Ess

Orbital Boom Sensor System Project Manager (2003 - 2005)



# Human Element: Kim Ess

Her marching orders: Do the work in six months for under \$40 million.

- Told the Program Requirements Control Board: the project would cost \$100 million and we had less than a 10 percent chance of completing the project in the next ten months.

“We were working so hard we didn’t have time to do anything but tell the truth.”

# Sensemaking

Creating a story is a learning process. You understand what happened by:

- Deciding where the story begins
- Choosing actions and elements that matter
- Defining cause and effect



# Knowledge Narrative in 2020

Use technology to make “documents” richer, more story-like:

- Video, videoconferencing, interactive docs

Continue to push for in-person story-telling:

- Interaction
- Inspiration