Wikipedia for SmallSats: The SSRI Knowledge Base

NASA S3VI Community of Practice Webinar Series
March 17, 2021

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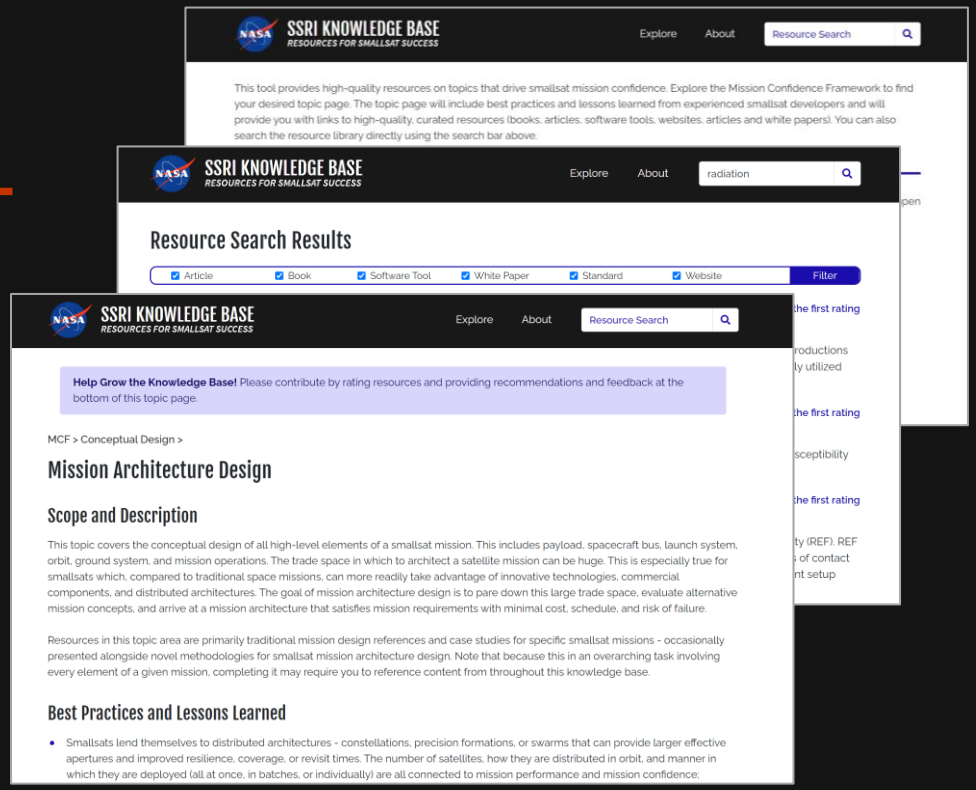
CEO and Co-founder
Sedaro Technologies



Small Satellite Reliability Initiative (SSRI)

Small Spacecraft Systems Virtual Institute (S3VI)

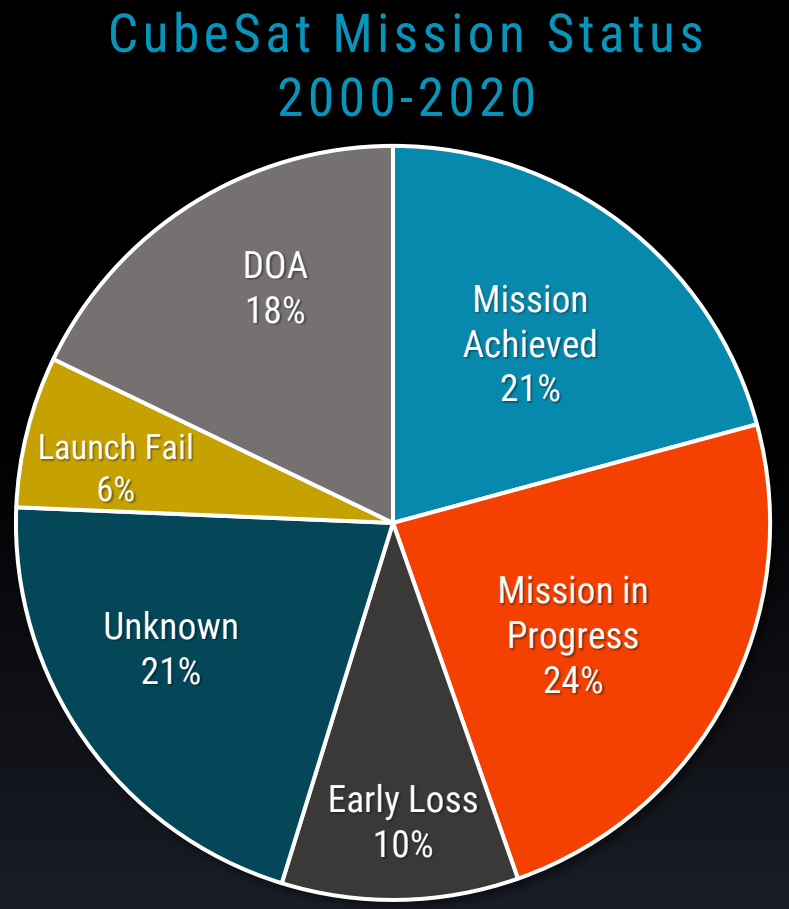
Small Satellite Reliability Initiative

“The SSRI seeks to share resources, best practices, and lessons-learned that improve mission confidence for small satellites while, to the extent practical, considering the constraints and maintaining the efficiencies associated with these missions.”

- Public-private collaboration kicked-off in 2017
- Monthly virtual tag-ups and annual technical interchange meetings
- Interested in joining the SSRI?
  - Help shape the state-of-the art and improve small satellite reliability
  - Email robbie.robertson@sedarotech.com

The Problems

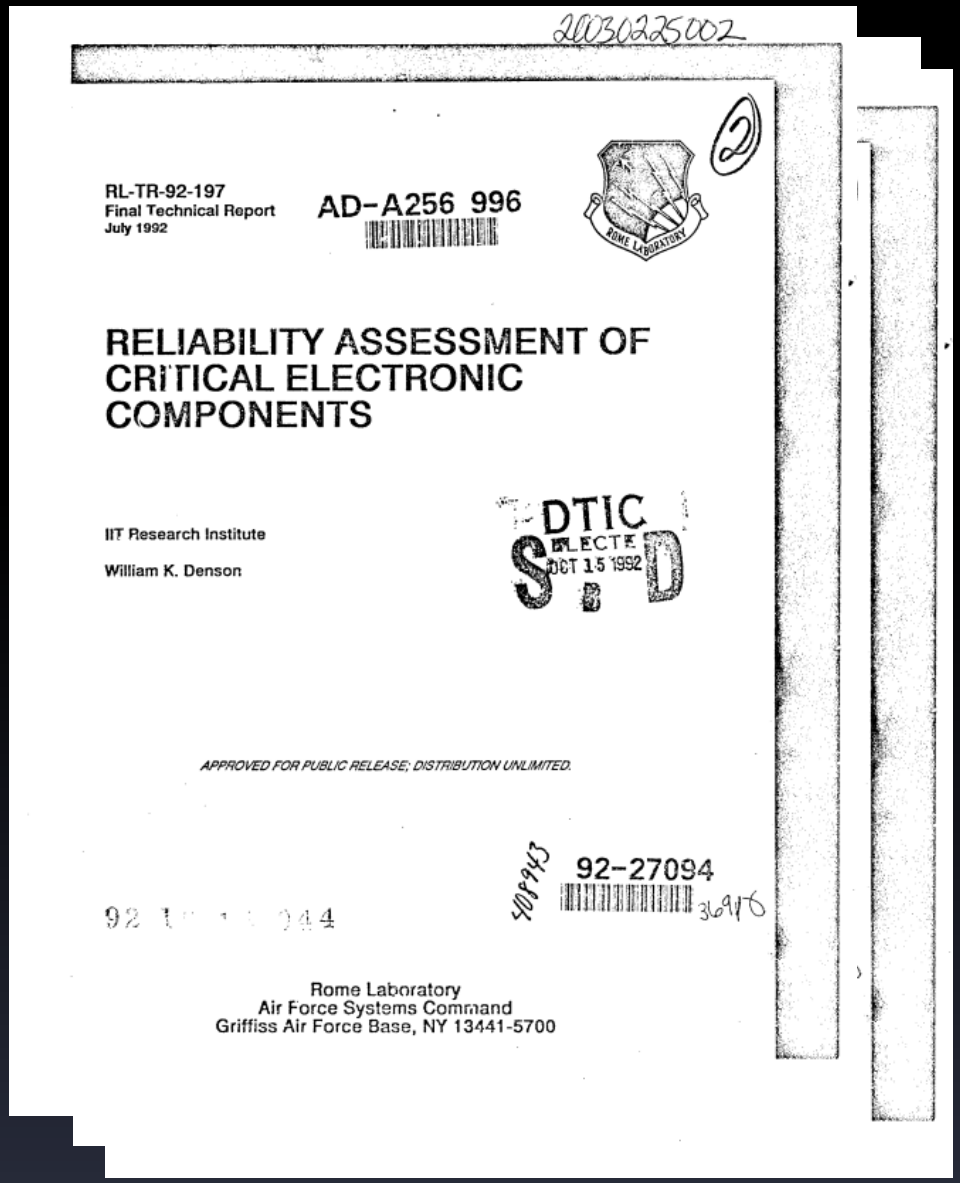
- Too many small satellite missions fail
- No quality, public forum for knowledge sharing



Data from M. Swartwout
https://sites.google.com/a/slu.edu/swartwout/home/cubesat-database

The Problems

- Too many small satellite missions fail
- No quality, public forum for knowledge sharing
- Slow and expensive methods of communicating best practices
- Constant change and innovation to keep up with



Our Approach

- Web-based tool
- Avoid prescriptive solutions

https://psyche.asu.edu/

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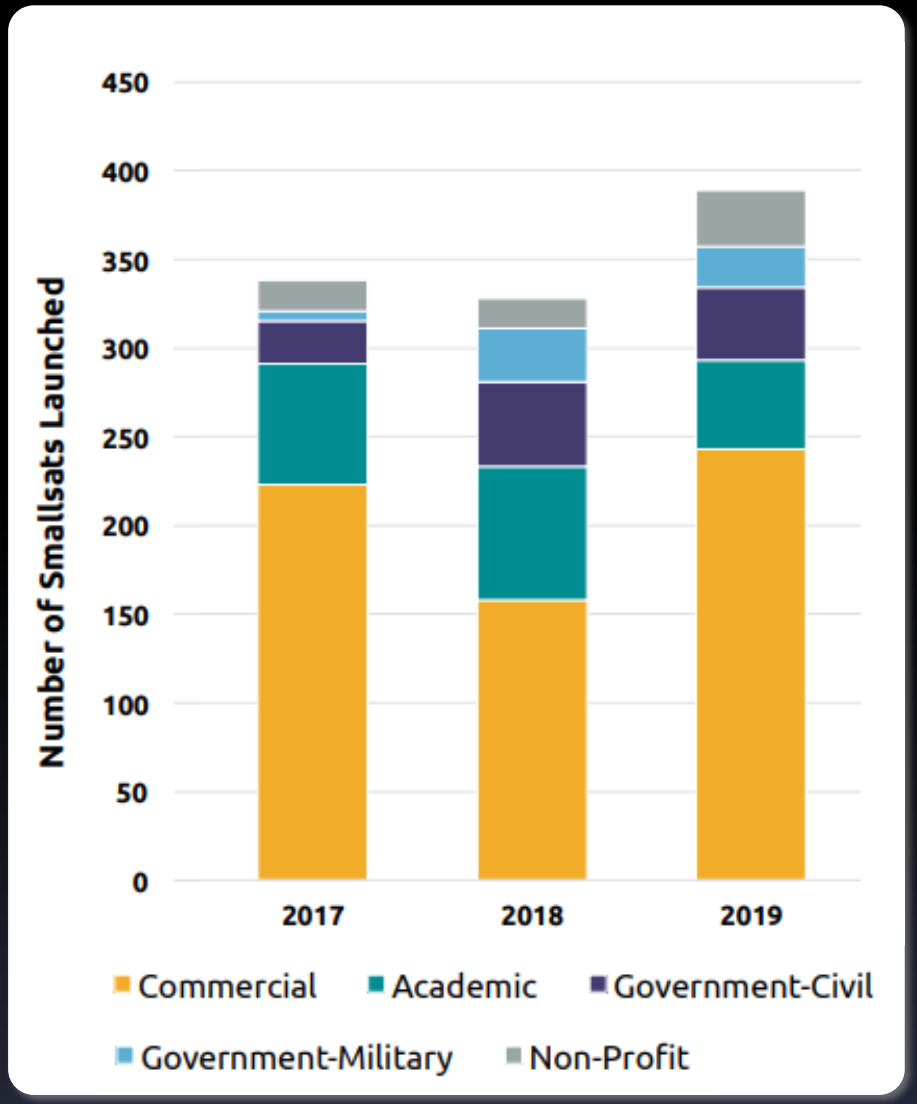
- Web-based tool
- Avoid prescriptive solutions
- Target a wide audience



https://www.brycetech.com/reports

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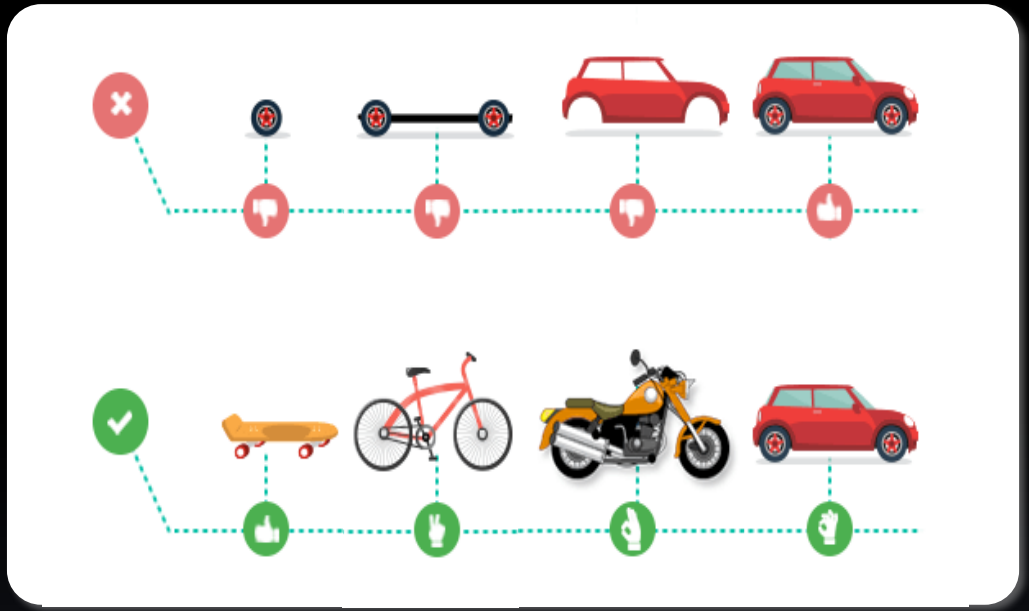
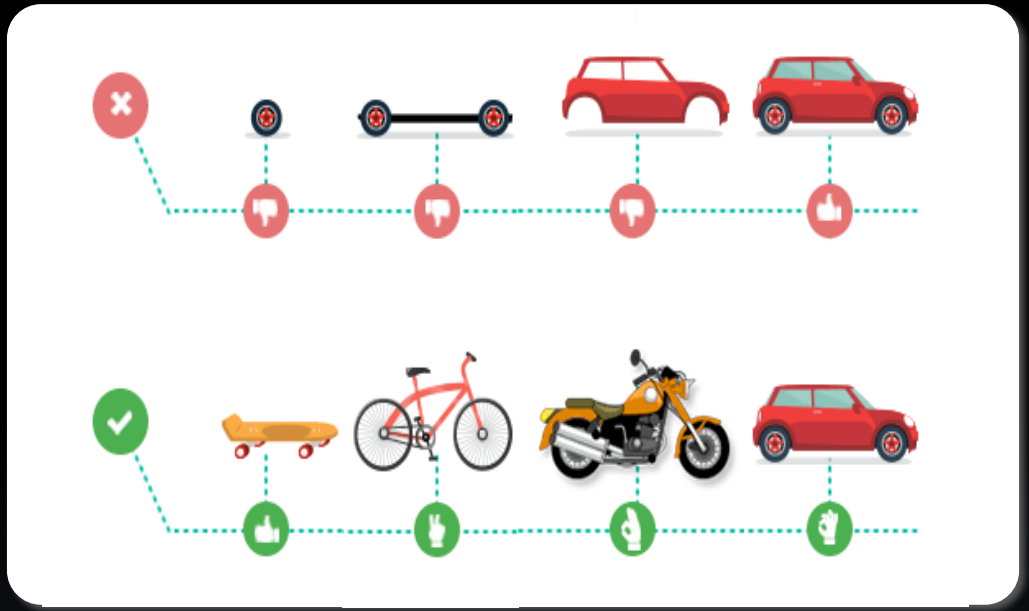
- Target a wide audience
- Fast, lean development



https://guide.quickscrum.com/minimum-viable-product/

Our Approach

- Web-based tool
- Avoid prescriptive solutions
- Target a wide audience
- Fast, lean development
- Adaptable, extendable



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The Solution: Wikipedia for SmallSats

Strengths of Wikipedia

- Free, publicly available tool
- Go-to starting place for information on a broad range of topics
- Open, collaborative development (crowdsourcing) for continuous growth and improvement

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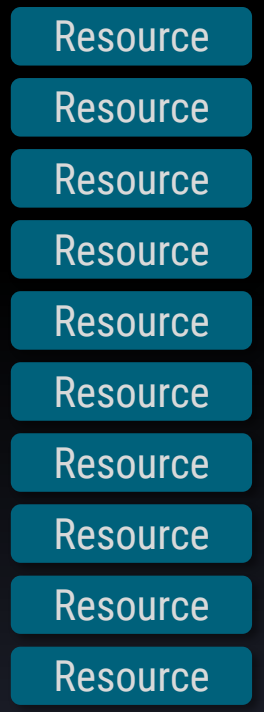
How is the SSRI Knowledge Base Different?

- Primarily providing users with existing, third-party content
- Final moderation by the SSRI, not the user community

Structure

Resource Library

- Third-party content
  - Articles, books, software tools, white papers, standards, and websites
- Access to resource
- SmallSat context
- Ratings



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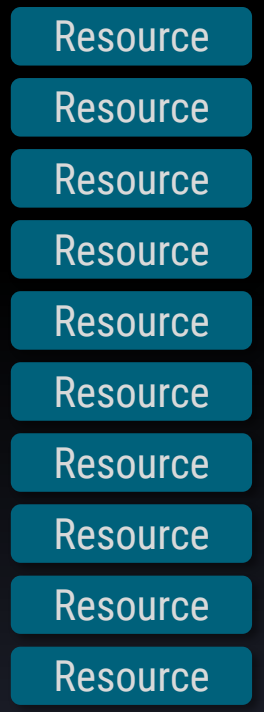

Mission Confidence Framework

- Order, structure, context
- Best practices & lessons learned
- User interfaces for submitting feedback and recommendations

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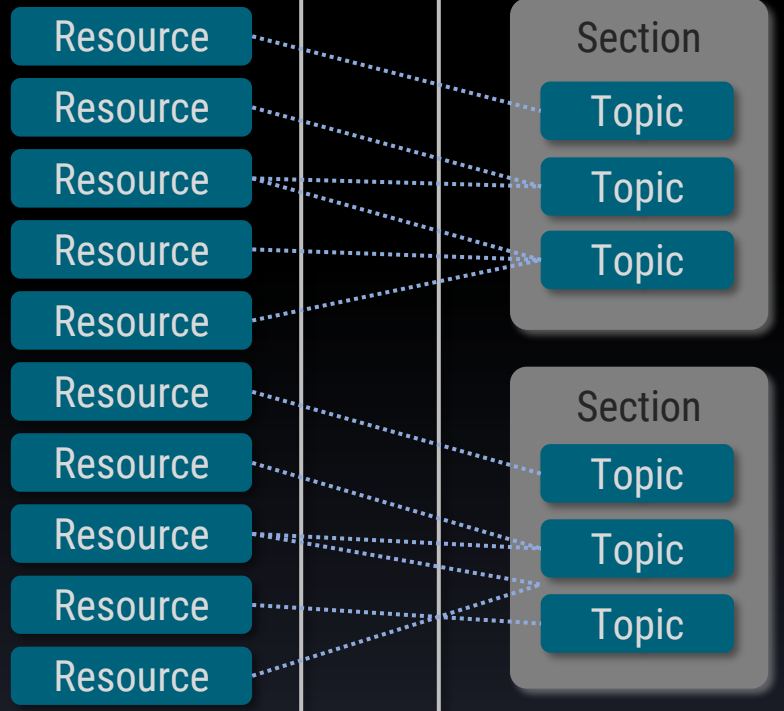

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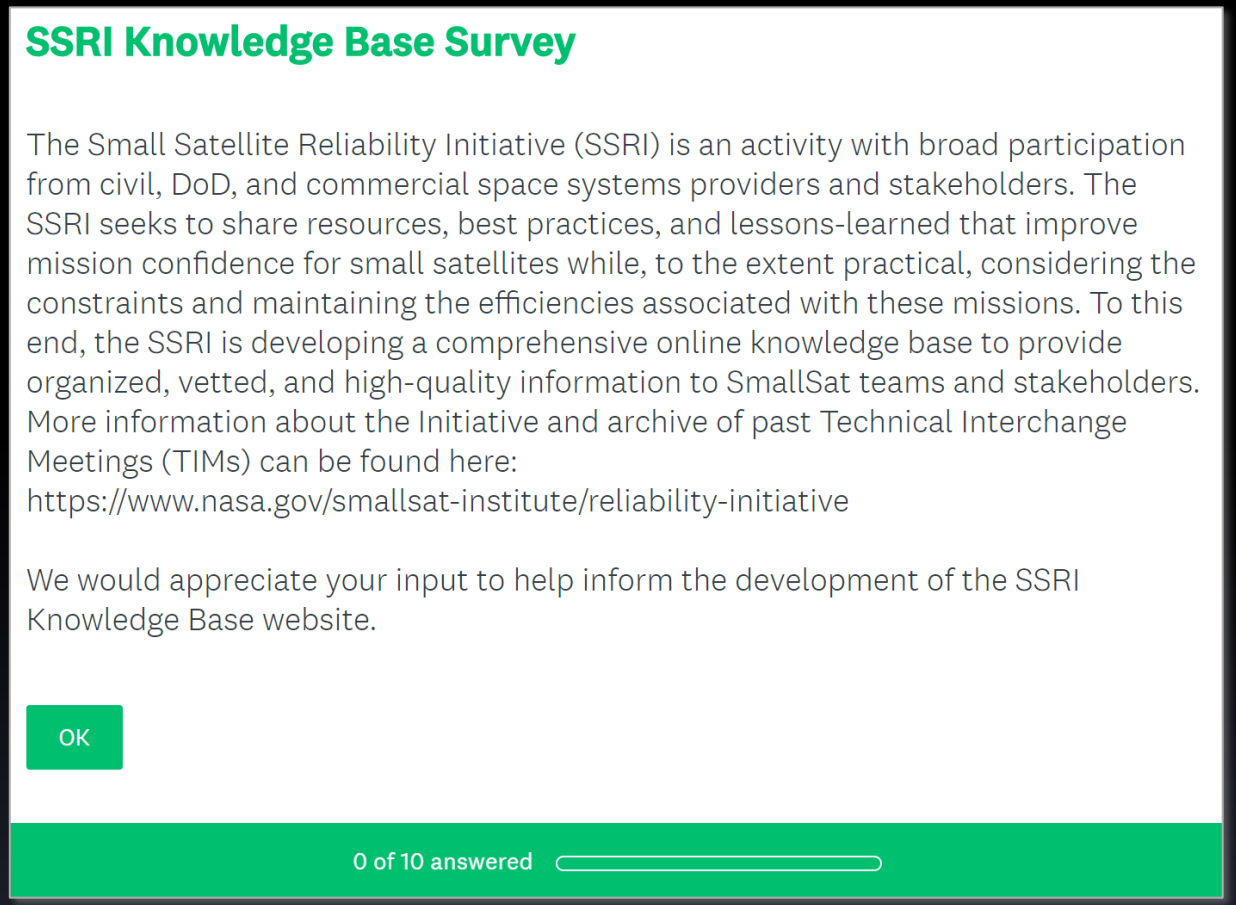
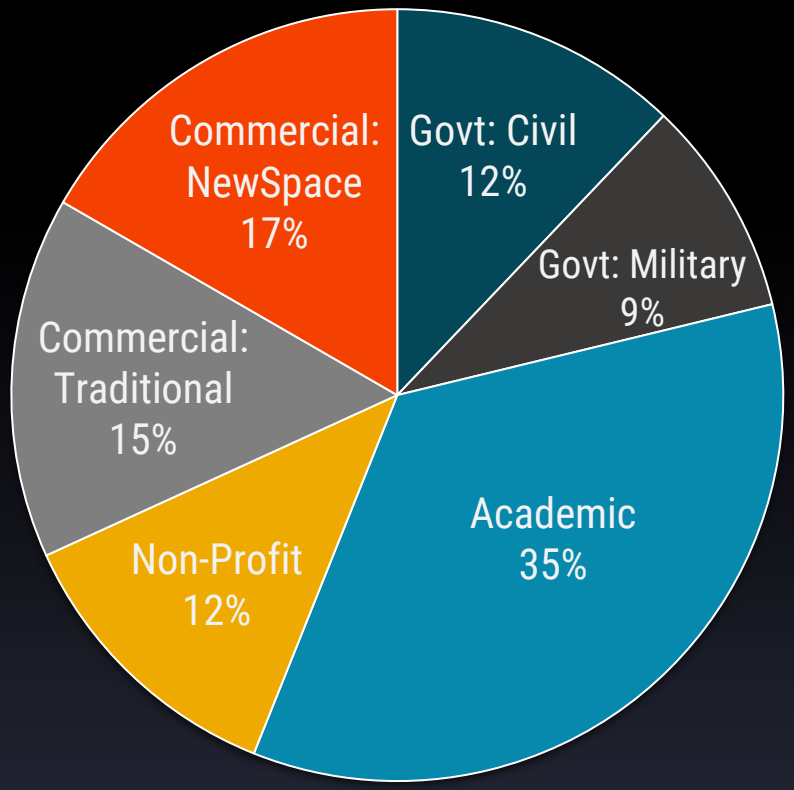
SmallSat Community Survey

- Online survey to inform design of the Knowledge Base
- Emailed to hundreds of SmallSat team members and stakeholders
- Diverse group of 66 respondents



SmallSat Community Survey

Respondent Demographics



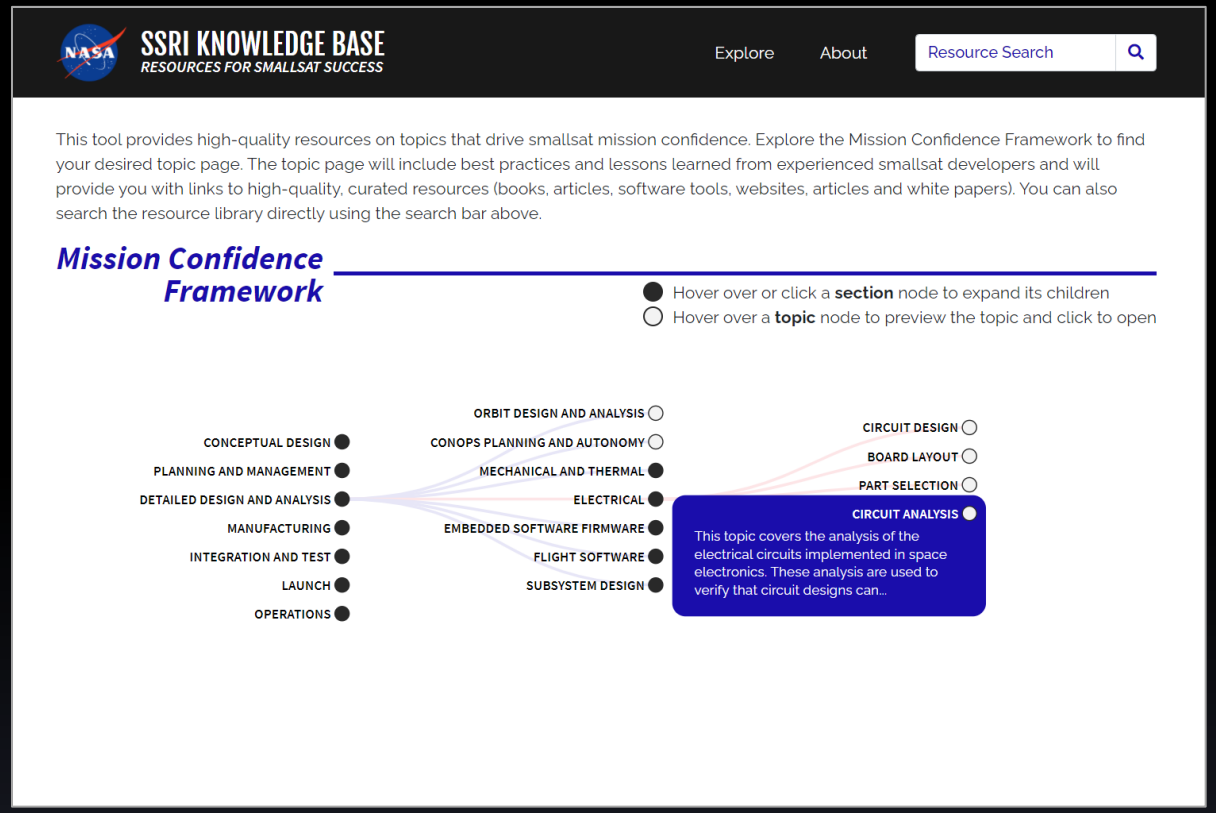
Outcomes

- “Mission Phase and Task” structure for the MCF
- Resource search and rating features
- User input interface on each topic page instead of centralized forum
- Content recommendations

Visual Design

Simple and Utilitarian

- Minimal distraction and clutter
- Allow for quick and efficient development
- Easy to update, grow, and evolve
- Efficient with users' time and energy



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Clean, Informal Aesthetic

- Avoid harshly technical, aggressive, tactical
- Use familiar interfaces and structures

Fonts

NASA SCIENCE

Overview

Fjalla One

SHARE THE SCIENCE

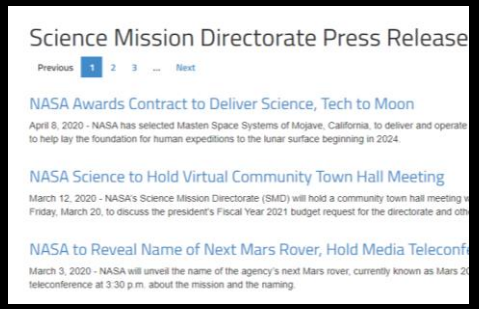
Science Topics News

Metropolis/ Source Sans Pro

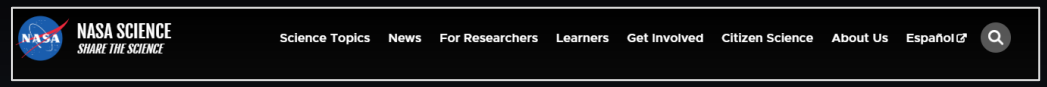
NASA leads the nation on a great

Raleway

Search Results



Header



Footer

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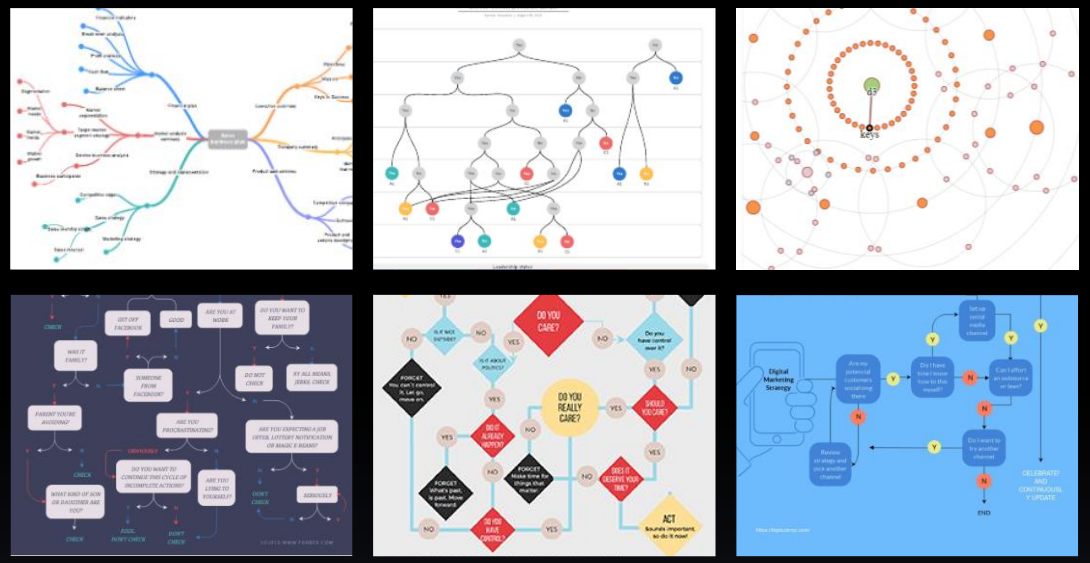
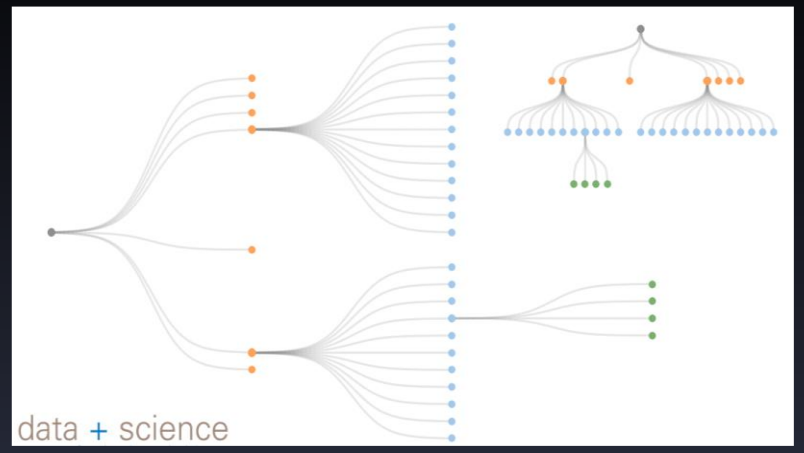
MCF Interface Design





Administration

User submits "Get Involved" message

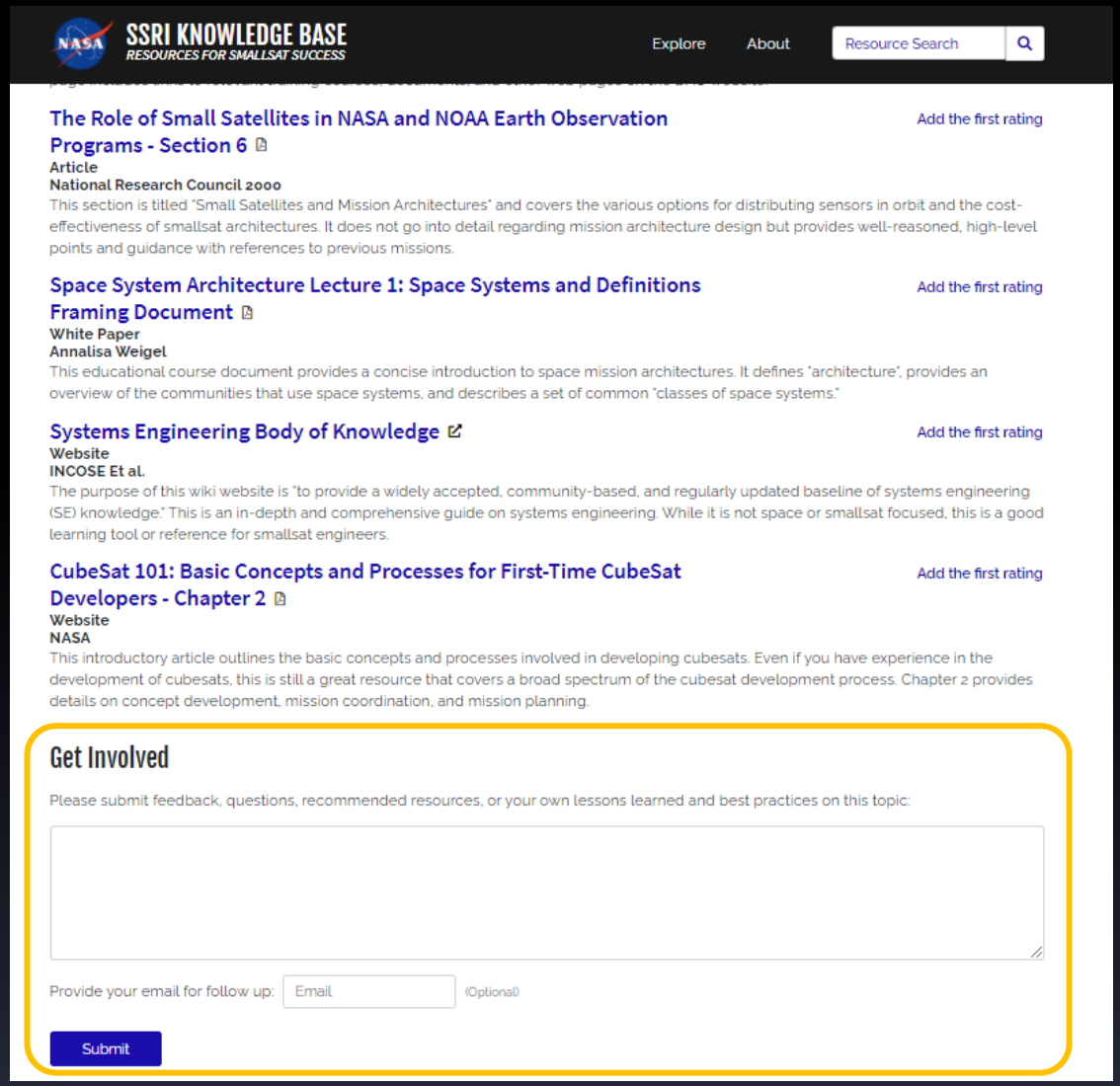
Admin receives user message via email

SSRI review of proposed new or updated content

Bug fix

Minor content correction

Admin posts new or updated content



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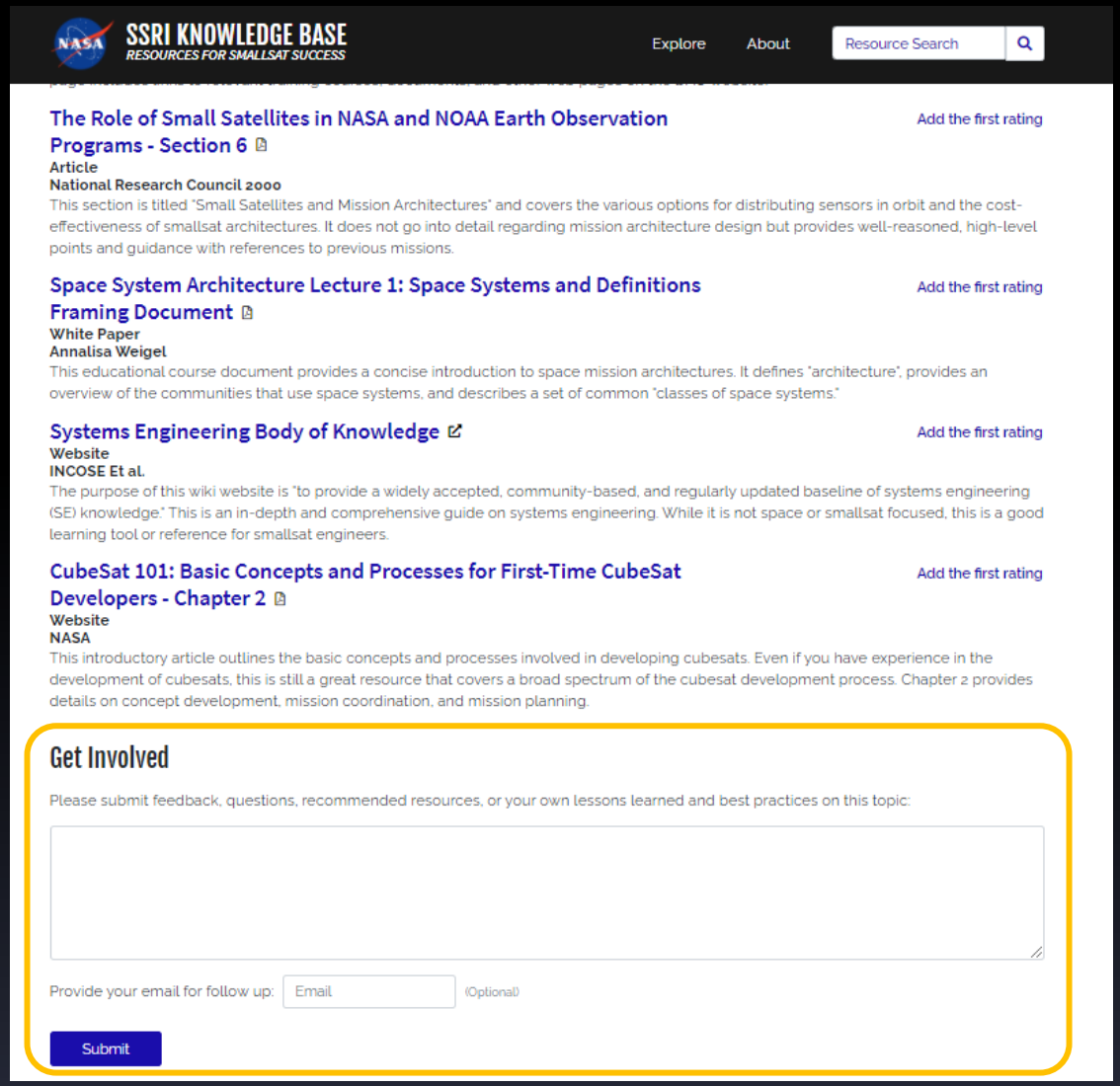

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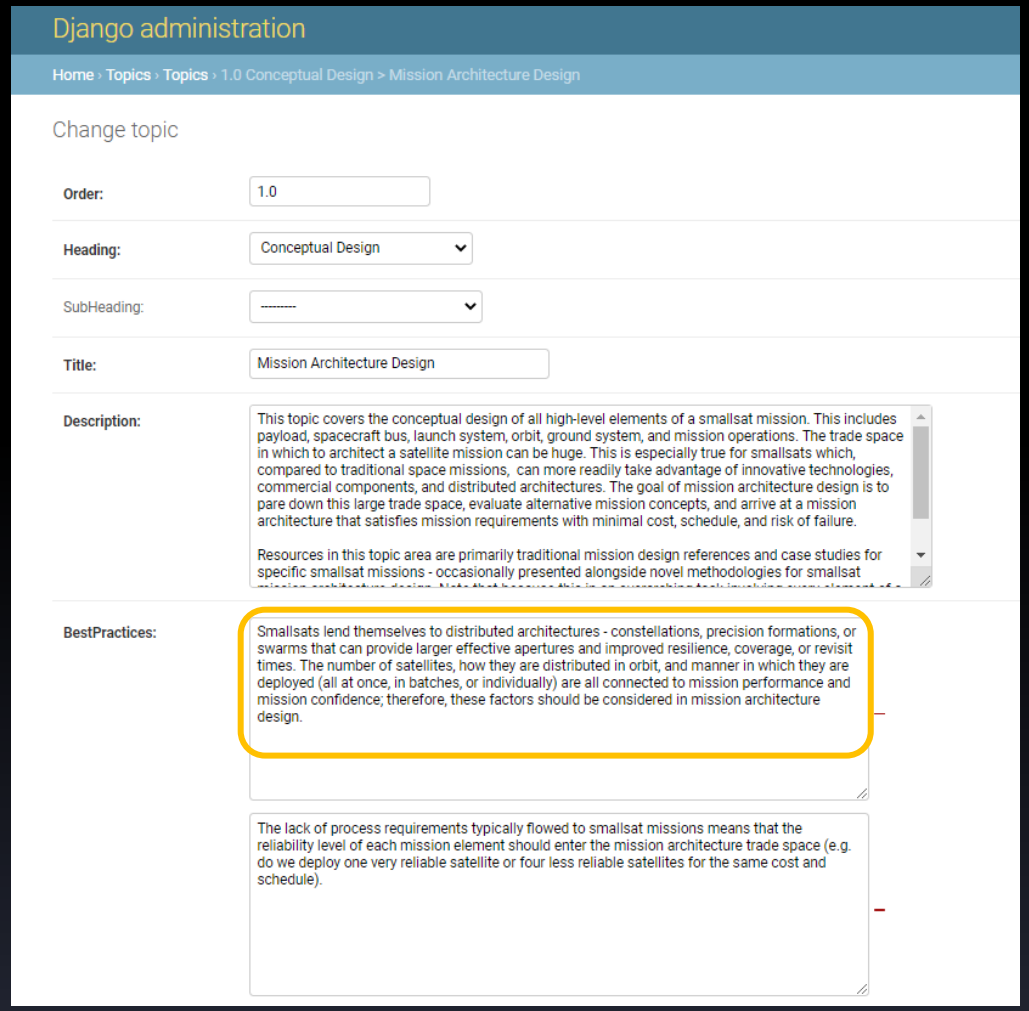

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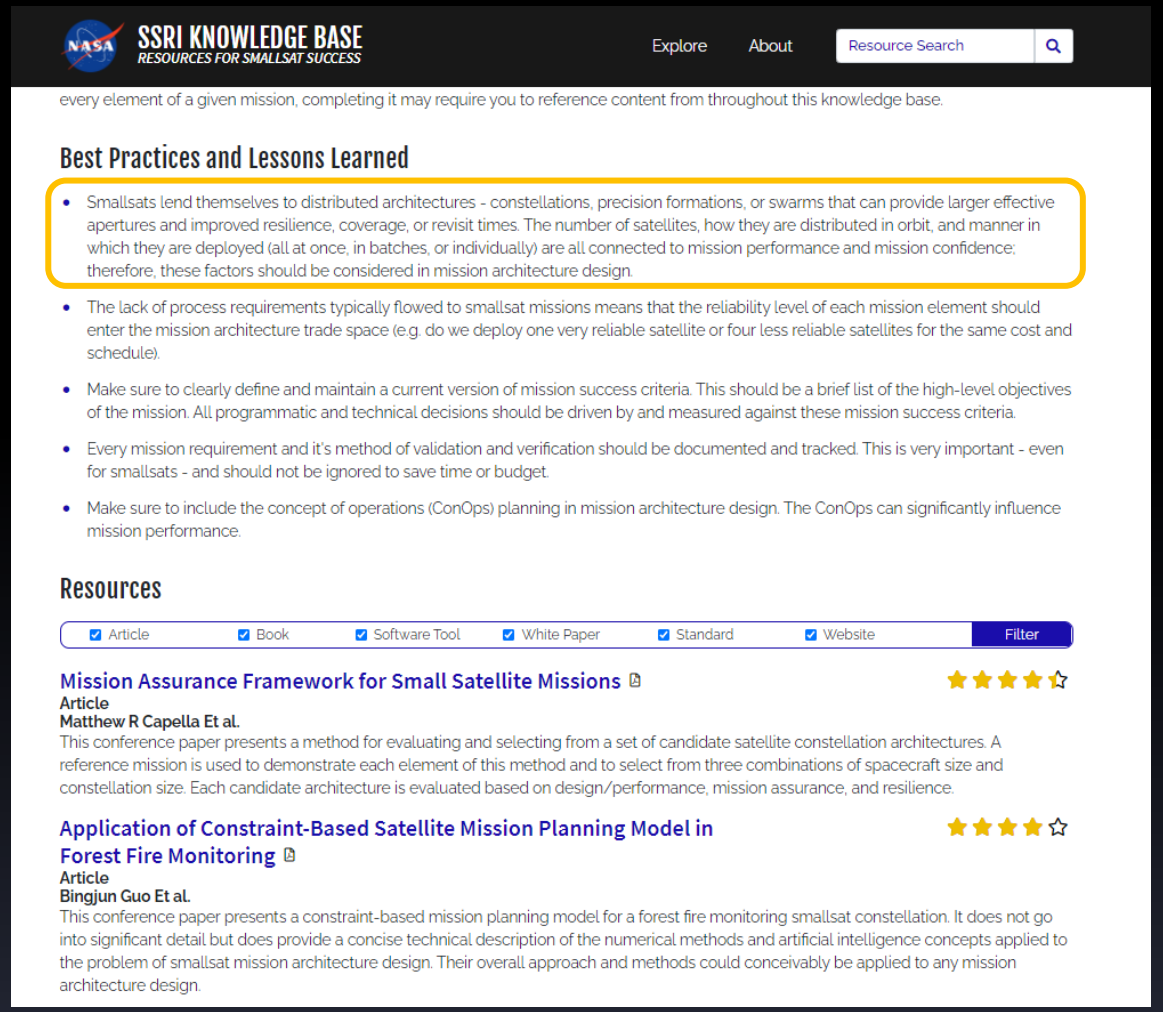

Sedaro Technologies

Demonstration

Use and contribute to the SSRI Knowledge Base at:

https://s3vi.ndc.nasa.gov/ssri-kb/

Have questions? Want to get involved?

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