Helix is a multi-year longitudinal research project that is focused on understanding what makes systems engineers effective and what creates an effective systems engineering capability in an organization.

**Atlas**, the theory of what makes systems engineers effective was released in December 2016 based on data from 287 individuals in 22 organizations.

**Atlas** outlines what makes individual systems engineers effective. It provides guidance for assessing a systems engineers’ skill and guidance on using this information for planning for both individuals and organizations.

Helix has transitioned from a focus on individual systems engineers to organizational systems engineering capabilities.

**Research Task / Overview**

Helix has updated research questions:

- How can organizations improve the effectiveness of their systems engineering workforce?
- How does the effectiveness of the systems engineering workforce impact the overall systems engineering capability of an organization?
- What critical factors, in addition to workforce effectiveness, are required to enable systems engineering capability?

The ultimate goal is to have a theory that is equivalent to **Atlas** which explains the key variables that define organizational systems engineering effectiveness. Current variables include workforce effectiveness and organizational culture, structure, and policy.

**Data & Analysis**

- Building on Atlas 1.0:
- In 2017, Helix team has:
  - Completed additional analysis of career paths for 4 new organizations.
  - Conducted interviews at 2 new organizations, with the new format focusing on the organization.
  - Implemented text mining principles for knowledge discovery.
  - Identified most frequent job performed by chronological positions.
  - Defined and tested organizational metrics.
  - Published findings at INCOSE, NDIA, ISEE

**Goals & Objectives**

- Research methodology is based on a Grounded Theory approach.
- Initially open-ended, exploratory interviews intended to provide a broad variety of data.
- Analysis focused on identifying key patterns and themes.
- Further interviews explored the patterns identified.

**Methodology**

- Participant Organizations: 335
- Practicing Systems Engineers: 22
- Systems Engineers Peers: 11
- Pages of Transcripts: 6000
- Hours of Audio: 270

**Future Research**

- New questions around organizational culture structure and capability.
- 48 interviewees focused on organizational capabilities.

**Participants**

| Senior | 65% |
| Mid-Level | 17% |
| Junior | 18% |

**Contacts/References**

Nicole Hutchison
nicole.hutchison@stevens.edu