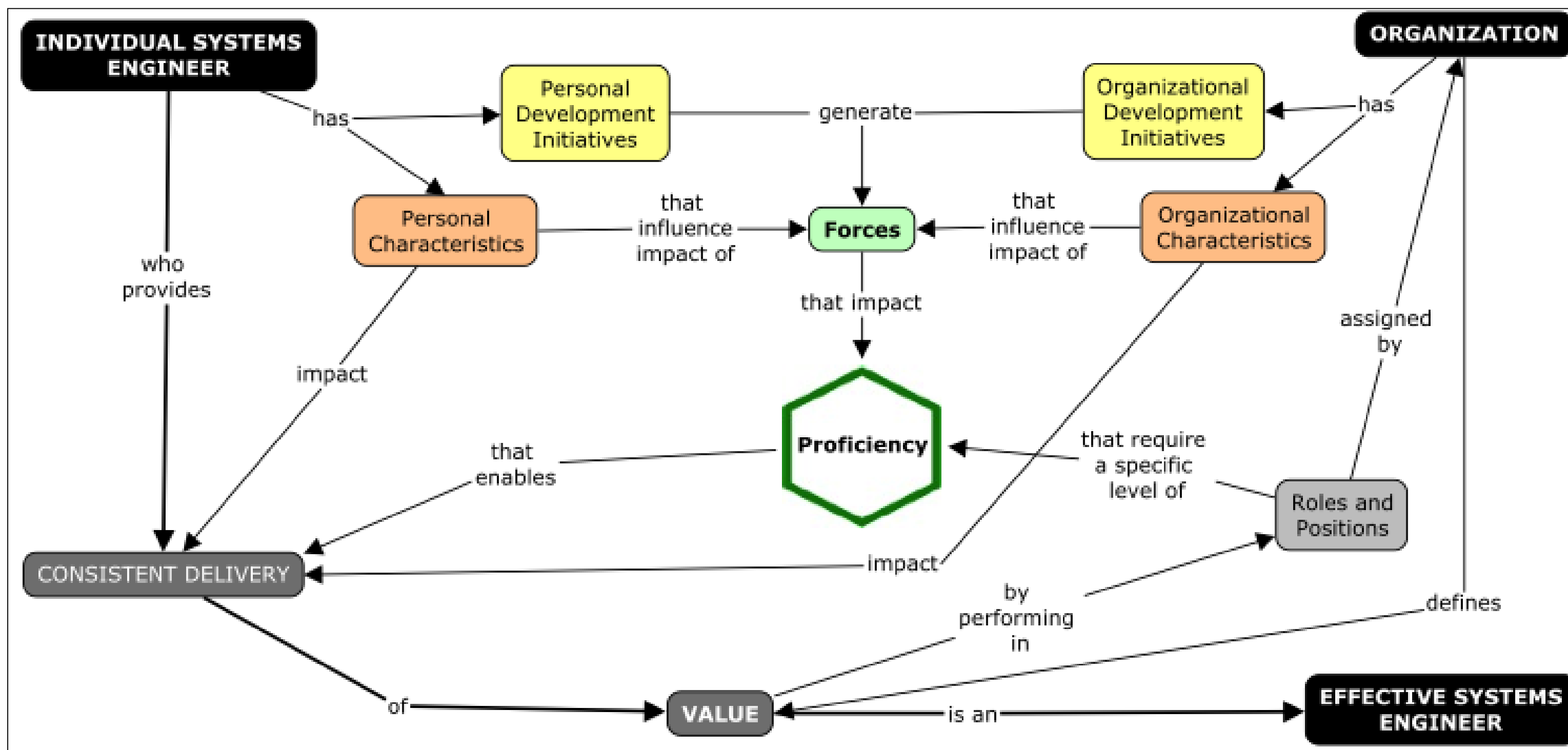


## Research Overview

Helix is a multi-year longitudinal research project that is developing *Atlas*, a theory of what makes systems engineers **effective**. *Atlas* is based primarily on in-depth interviews with well over 200 systems engineers and those who work with them. The sample population comes largely from the DoD and its industrial support base, but also includes professionals from other industry sectors such as healthcare and information technology. *Atlas 0.5*, the current release, is in early trial use. *Atlas 1.0*, planned for release towards the end of 2016, is expected to be mature enough for independent deployment and assessment by individuals and organizations and will include specific guidance for implementation in practical settings.



## The Story

A systems engineer is **effective** when she consistently delivers value as defined by the organization. Value delivery occurs over time when the individual performs specific **roles** (such as **customer interface**) in a series of **positions** (such as **chief systems engineer**).

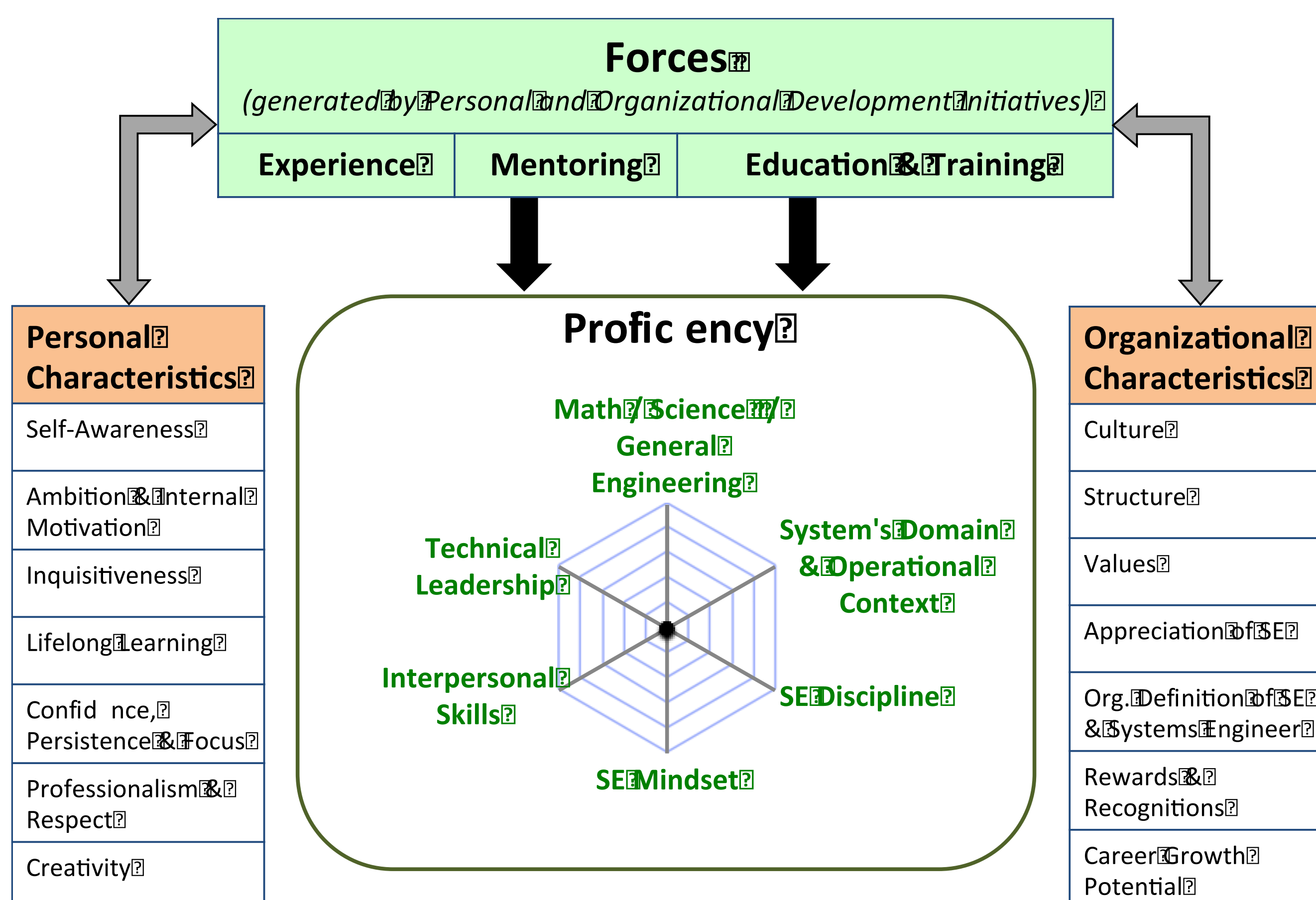
Enabling value delivery are **proficiencies** the systems engineer possesses. Over time, **forces** impact the level of those proficiencies, influenced by her **personal characteristics** and **personal development initiatives**, and by **organizational characteristics** and **organizational development initiatives**.

## A Snapshot

**Experiences** are the dominant force, followed by **mentoring** and then by **education & training**.

At any moment, an individual has a proficiency profile reflecting her current mastery of 6 proficiency **areas**, divided into 28 distinct **categories**; e.g., SE Mindset includes **systems thinking** while **system's domain and operational context** includes the **relevant domains** for the types of systems on which she works.

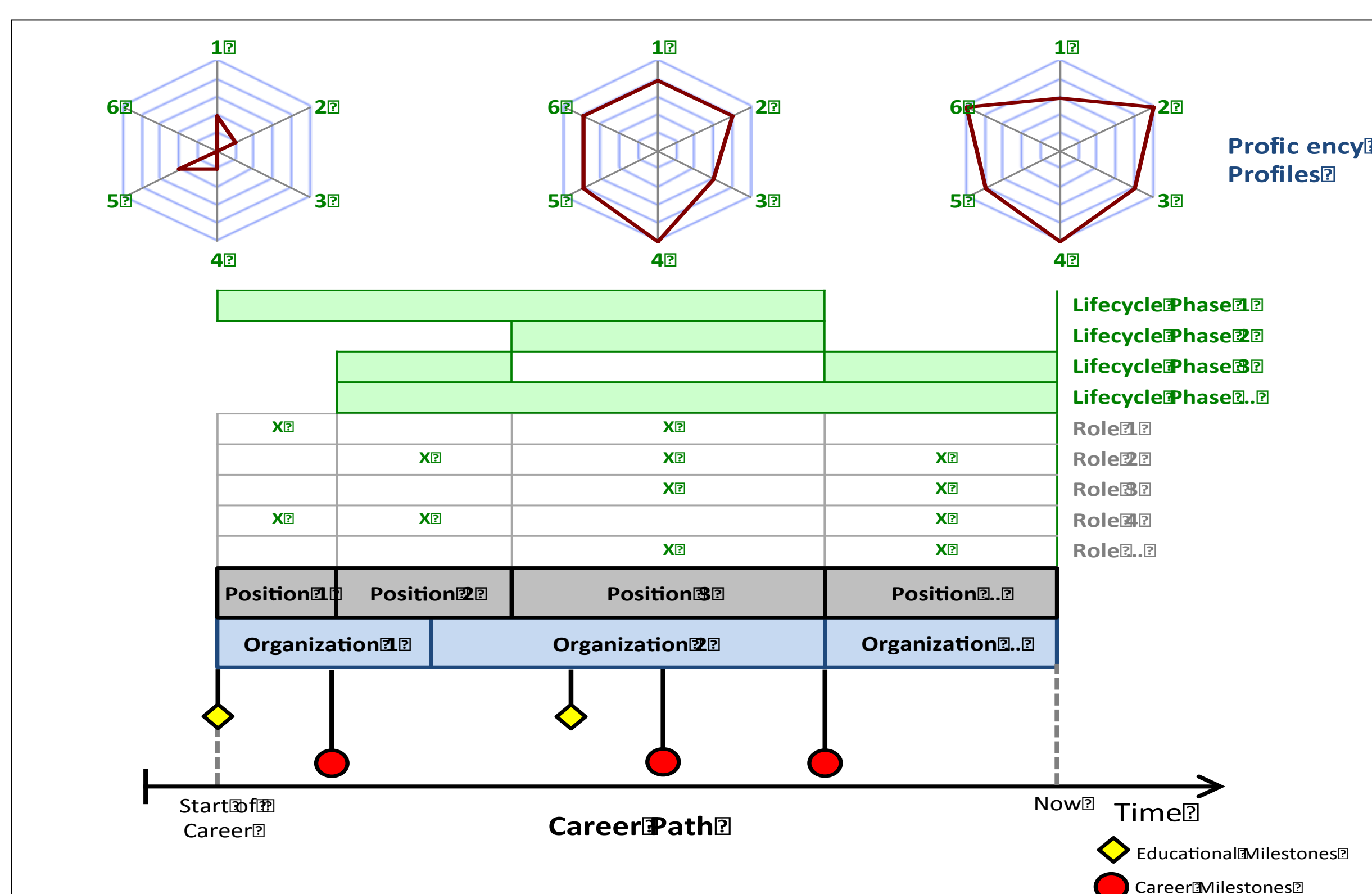
Personal characteristics, such as **self-awareness**, and organizational characteristics, such as **culture**, can strongly influence the degree to which an individual is exposed to the 3 forces and how that individual reacts to them; e.g., a person who is quite self-aware may seek out experiences, mentors, and education & training to address her weaknesses. The organization's culture may enable or inhibit that search.



## Emerging Recommendations

A **career path** is the sequence of positions a systems engineer holds over time in various organizations, performing different roles, working across different lifecycle phases, and reaching different career milestones, all with evolving proficiency profiles.

Patterns emerge by examining the career paths of effective systems engineers. For example, chief systems engineers usually have a master's degree, often in business, have worked in nearly every systems engineering role that Helix identified, have worked on several system types, and been part of multiple organizations with differing cultures and processes.



## Contact

Dr. Art Pyster

Stevens Institute of Technology, Hoboken, NJ

[Art.Pyster@stevens.edu](mailto:Art.Pyster@stevens.edu)