Enabling Individuals

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This knowledge area focuses on enabling an individual to perform SE and addresses the roles of individuals in the SE profession, how individuals are developed for and assessed in these roles, and what ethical behavior is expected of them. Once an individual is enabled to perform SE using the techniques described here, the individual can apply the knowledge found in Part 3, Systems Engineering and Management, about how to perform SE.

Part 5, Enabling Systems Engineering, to which this knowledge area belongs, explores how systems engineering (SE) is enabled at three levels of organization: the business or enterprise, the team, and the individual. Ultimately, individuals perform SE tasks within a team or business.

For the sake of brevity, the term "business" is used to mean "business or enterprise" throughout most of this knowledge area. For a nuanced explanation of what distinguishes a business from an enterprise, see Enabling Systems Engineering.

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Contents

Topics

Each part of the SEBoK is composed of knowledge areas (KAs]. Each KA groups topics together around a theme related to the overall subject of the part. This KA contains four topics:

- Roles and Competencies discusses allocation of SE roles, which sets of competencies correspond to particular roles, and what competency models are current in the SE world.
- Assessing Individuals discusses how to determine the level of individual proficiency and quality of performance.
- Developing Individuals explains how SE competency is acquired.
- Ethical Behavior describes the ethical standards that apply to individuals and organizations.

Context

The following brief review of terms and concepts provides context for the topics in this knowledge area.

Individuals, Teams, Businesses, and Enterprises

The ability to perform SE resides in individuals, teams, and businesses. An expert systems engineer possesses many competencies at a high level of proficiency, but no one can be highly proficient in all possible competencies. Collectively, a team and a business might possess all needed competencies at a high level of proficiency. A business performs the full range of SE roles, may have dedicated functions to perform specific SE roles, and may have a strategy for combining individual, team, and business abilities to execute SE on a complex activity. Individuals within the business may be responsible for performing one or more roles.

For descriptions of SE roles and competencies from the literature, see Roles and Competencies.

Competency, Capability, Capacity, and Performance

The final execution and performance of SE is a function of competency, capability, and capacity. There is some complexity here. For example:

- There is disagreement in the literature about whether the term competency applies to the individual level only, or can be correctly used at the team, project, and enterprise levels as well.
- Capability encompasses not just human capital, but processes, machines, tools, and equipment as well. Even if an individual has an outstanding level of competency, having to perform within a limited timeframe might degrade the results. Capacity accounts for this.

Systems Engineering Competency

Competency is built from knowledge, skills, abilities, and attitudes (KSAA). What is inherent in an individual may be subsequently developed through education, training, and experience. Traditionally, SE competencies have been developed primarily through experience, but recently, education and training have taken on a much greater role.

SE competency must be viewed through its relationships to the systems life cycle, the SE discipline, and the domain in which the engineer practices SE.

Competency Models

SE competency models can be used to explicitly state and actively manage the SE competencies within in an organization.

Competency models for SE typically include:

- technical KSAAs;
- "soft" KSAAs such as leadership and communications;
- KSAAs that focus on the domains within which SE is to be practiced;
- a set of applicable competencies; and
- a scale for assessing the level of individual proficiency in each competency (often subjective, since

proficiency is not easily measured).

See Roles and Competencies for descriptions of publicly available SE competency models.

References

None.

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