SWEBOK KA #1: Software Requirements

The Software Engineering Body of Knowledge (SWEBOK) features 11 knowledge areas (KAs). The first KA is Software Requirements. The Software Requirements KA is focused on elicitation, analysis, specification, and validation of software requirements. It includes seven topics, as shown in Figure 1. These topics are Software Requirements Fundamentals, Requirements Process, Requirements Elicitation, Requirements Analysis, Requirements Specification, Requirements Validation, and Practical Considerations.

The Software Requirements Fundamentals topic includes the definition of a software requirement. A software requirement is defined as “a property which must be exhibited in order to solve some problem in the real world.” This topic also defines different types and aspects of requirements, including: product requirements and process requirements, functional requirements and nonfunctional requirements, and emergent properties. The topic emphasizes that requirements must be quantifiable. Finally, it covers the distinction between system requirements and software requirements.

The Requirements Process topic introduces the software requirements process, which includes process models, process actors, process support and management, and process quality and improvement. The process actors are the different stakeholders in the requirements process, including users, customers, market analysts, regulators, and software engineers.

The Requirements Elicitation topic covers where software requirements from and how they are collected. Requirements come from many sources (such as goals or stakeholders) and can be identified using many elicitation techniques (such as interviews, prototypes, or observation).

The Requirements Analysis topic is focused on analyzing requirements. It includes requirements classification, which involves determining properties such as priority, scope, and volatility. It also covers conceptual modeling, architectural design and requirements allocation, and requirements negotiation. Requirements negotiation is the task of resolving incompatible or conflicting requirements.

The Requirements Specification topic discusses producing a document of software requirements. It covers the three types of documents which are produced: the system definition document, the system requirements specification, and the software requirements specification. The system definition document covers the high-level system requirements. The system requirements specification is used for systems with substantial software and non-software components. The software requirements specification documents software requirements and is derived from the system requirements specification.

The Requirements Validation topic discusses methods for verifying requirements. This includes methods such as requirements reviews, prototyping, model validation, and acceptance tests. These methods should be used to ensure that the requirements specification is understandable, consistent, and complete.

The Practical Considerations topic includes some of the practical concerns of the software requirements process. The first aspect is the iterative nature of the requirements process. Next, the importance of change management and requirements attributes are addressed. Requirements tracing involves tracking the source of requirements. Lastly, measuring requirements is an important aspect of requirements management.

Figure 1. Breakdown of Topics for the Software Requirements Knowledge Area

