Verification Notes

Reading Notes:

29148-2018 6.5.2.2 Prepare for verification

- Verification method - defines how, where, and when each requirement's compliance can be proven for acceptance
    - One is associated with each requirement to define activities that prove satisfaction of a requirement
    - How - identify the verification method
    - Who - identify who is responsible for performing verification
    - When - when the verification is going to be done, event-based
    - Where - specify any environment needed for the verification
- Inspection - examine the item against documentations to confirm it is in compliance with requirements
- Analysis - uses analytical data or simulations under defined conditions to show theoretical compliance. Technique is used when testing under realistic conditions can't be done
- Demonstration - qualitative demonstration of functional performance, uses a set of test actives with stimuli to show that the system responds to stimuli with allocated functions
- Test - operation, supportability, and performance of an item is verified under controlled conditions.

29148-2018 6.5.2.3 Manage results of verification

- Requirements traceability - trace a requirement back to the source of the requirement and forward through the life cycle to asses that the requirement is met
    - verification methods and information are associated with the requirement to indicate how the system is verified
    - include unique identifiers for each requirement

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- state the verification approaches and methods planned to satisfy the software

SEBOK System Verification

- Verification - confirmation, through the provision of objective evidence, that specified requirements have been fulfilled
- Must verify - documentation, stakeholder requirements, system requirements, design, system, aggregate, and verification procedure
- Verification techniques -
    - Inspection - based on visual or dimensional examination of an element; verification relies on the human senses or uses methods of measurement and handling
    - Analysis - based on analytical evidence obtained without any intervention on the submitted element using math, calculation, logic, modeling, or simulation
    - Analogy - based on evidence of similar elements or experience feedback
    - Demonstration - used to demonstrate correct operation of the submitted element against operational and observable characteristics without physical measurements
    - Test - performed on the element by which functional, measurable characteristics, operability, supportability, or performance capability is quantifiable verified when subjected to controlled conditions.
    - Sampling - number, tolerance, and other characteristics must be specified to be in agreement with the experience feedback

MITRE Systems Engineering Guide p 356

- Verify that the system meets all applicable requirements from the MITRE system level requirements checklist on page 356

The four fundamental methods of requirement verification

- Inspection
    - nondestructive examination of a product or system using senses (visual, auditory, smell, feel, taste)
- Demonstration
    - manipulation of the product to verify that the results are as planned
- Test
    - verification of a product using controlled and predefined series of inputs, data, or stimuli to ensure the product produces the predefined output
- Analysis

- verification of a product using models, calculations, and testing equipment. Used to predict the breaking point of a product by using nondestructive testing to find the failure point.

"Software Requirements" Wiegers book Chapter 17: Validating the requirements

- Validating requirements - allows teams to build a correct solution that meets stated business objectives
- Requirements validation ensures
  - requirements accurately describe the intended system capabilities
  - software requirements are correctly derived from the business requirements, system requirements, business rules
  - requirements are complete, feasible, and verifiable
  - all requirements are necessary
  - requirements are consistent
  - requirements provides basis to proceed with design and construction

Link to Verification Page:

Verification