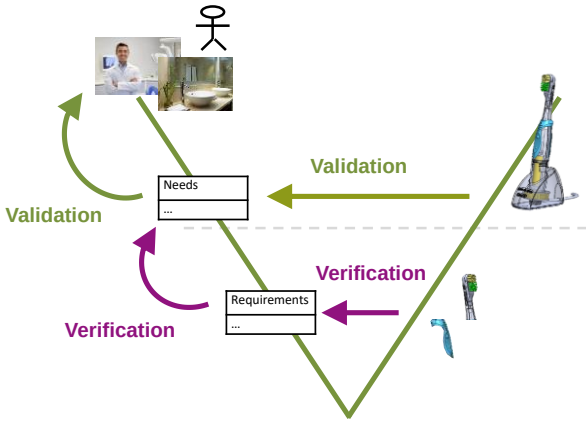
Validation and verification

Take Away

Purpose Guarantee that the system is operationally, functionally and constructionally consistent and takes correctly into account all its expected properties

Key concepts



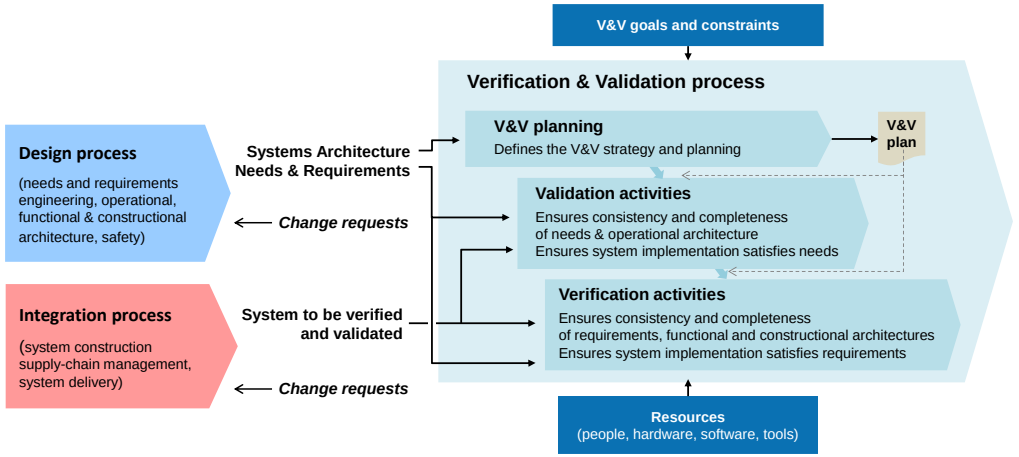
Validation answers the question:
Is the system correctly designed from stakeholders points of view?
(are we doing **the right system**?)

Verification answers the question:
Is the system correctly designed from engineers points of view?
(are we doing **the system right**?)

Key points

- Remedying an anomaly when a system is in service is often much more expensive than when it is detected and corrected during the engineering and V&V phases
- Be aware of the main difficulties linked to verification & validation:
  poor design/V&V integration, psychological difficulties, lack of time & budget, incomplete coverage
- Verification & validation are recursive processes that should be conducted at each level of a system

Process



Good practices

V&V method	Model-oriented V&V practices	Integration-oriented V&V practices
Analysis	▪ Manual or automatic analyses of a model (syntactic rules verification, crossed analyses, completeness analysis, etc.)	▪ Functional demonstrations (e.g. users interfaces, components behaviours, etc.) ▪ Prototyping (e.g. for safety analyses, etc.)
Review	▪ Model self-examinations ▪ Specifications pear reviews (quality & completeness of needs, requirements & descriptions)	▪ Pear reviews of the integrated system ▪ More or less formal reviews of the integrated system by the stakeholders ▪ Returns on experience
Test	▪ Simulations (e.g. using MATLAB & Simulink)	▪ Unitary and integration tests of the integrated system components (at each systemic level) ▪ Formal qualification of the integrated system with its stakeholders