



VERIFICATION AND VALIDATION

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TNO innovation
for life

TNO **Q**uality
Verification and Validation Solutions

This lecture is about two things

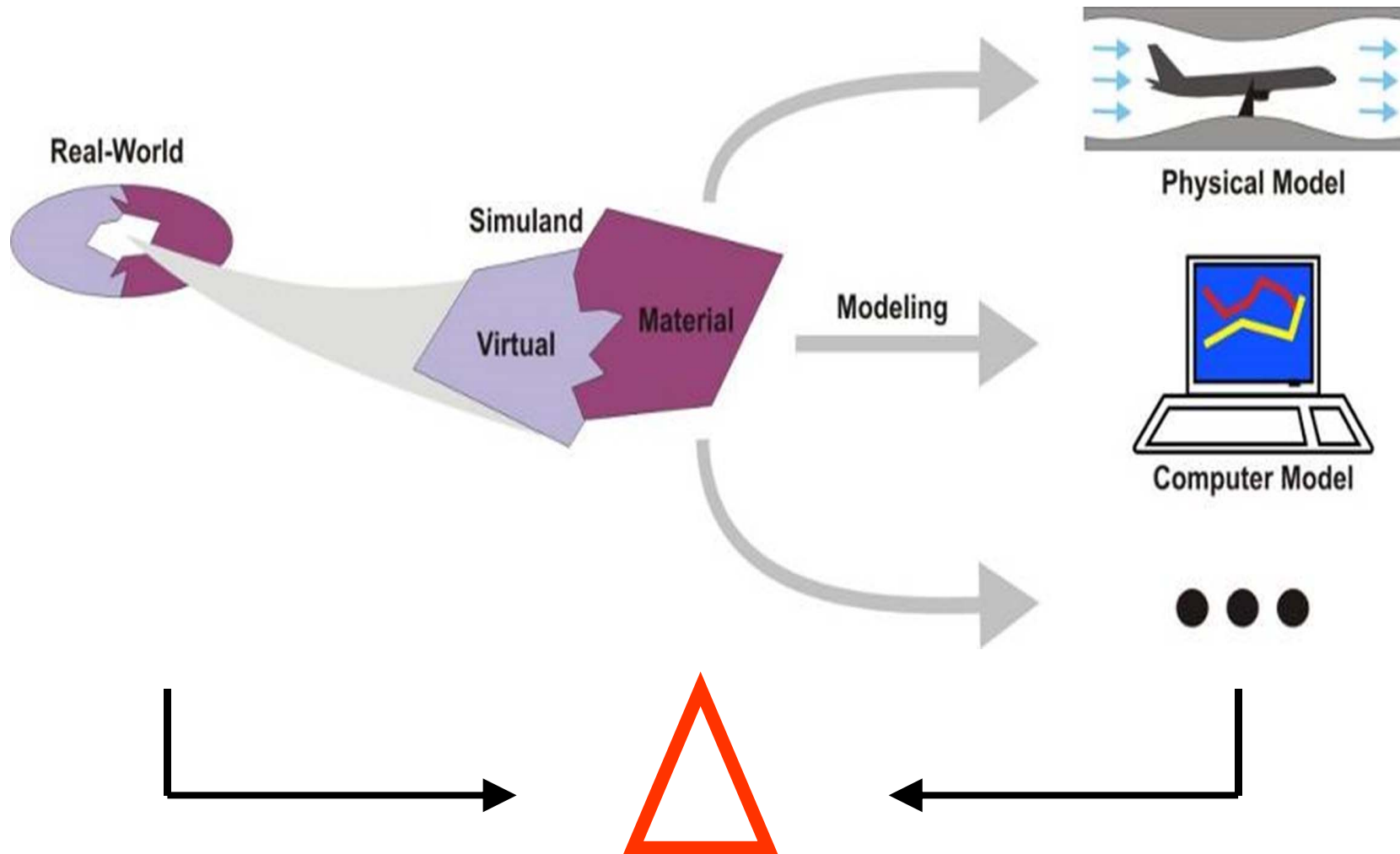
- You have to do V&V
 - because there is risk involved
- You have to do V&V in a structured way
 - to be more effective and more efficient

Part 1

- **You have to do V&V**
 - **because there is risk involved**

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What are M&S and V&V?



V&V

- Provides insight into and advice on the quality of the M&S system over its entire life cycle, and the associated risks
- Risk reduction

Part 2

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Structured approach to V&V



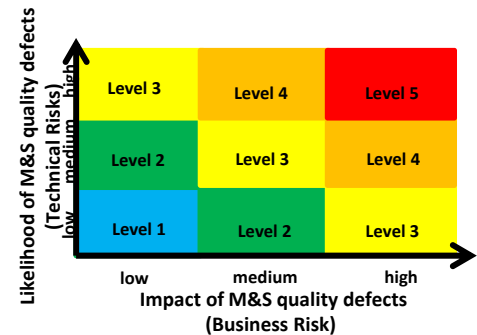
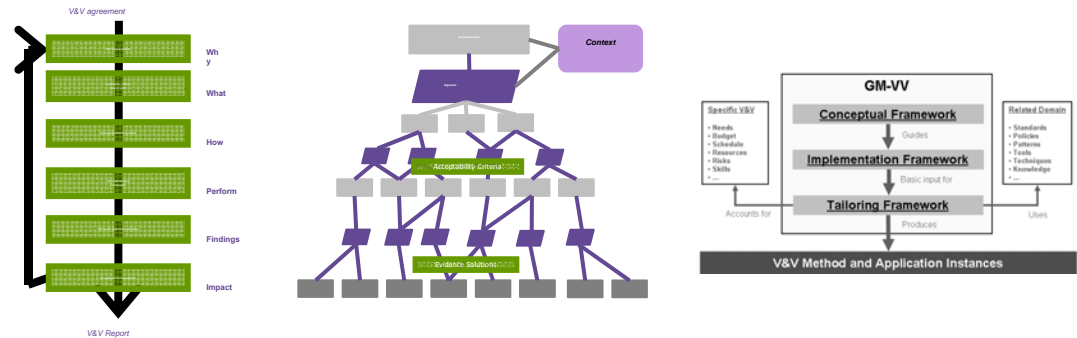
Generic Methodology for Verification and Validation (GM-VV) to Support Acceptance of Models, Simulations and Data

GM-VV Vol. 1: Introduction and Overview

SISO-GUIDE-001.1-2012

5 October 2012

Prepared by:
SISO Generic Methodology for Verification and Validation Product Development Group (GM-VV PDG)





Independent Dutch V&V expertise center

Netherlands Organization for Applied Scientific Research - TNO

Dutch National Aerospace Laboratory - NLR

Practical knowledge and experience with structured V&V

Execute V&V projects

Education and training



Public Order Management (POM)

Typical examples:

making sure that demonstrations do not get out of hand, stop riots, security of airports

Training:

Costly in terms of time, budget, human effort

Combined (staff + footers) training not efficiently



POM Serious Game

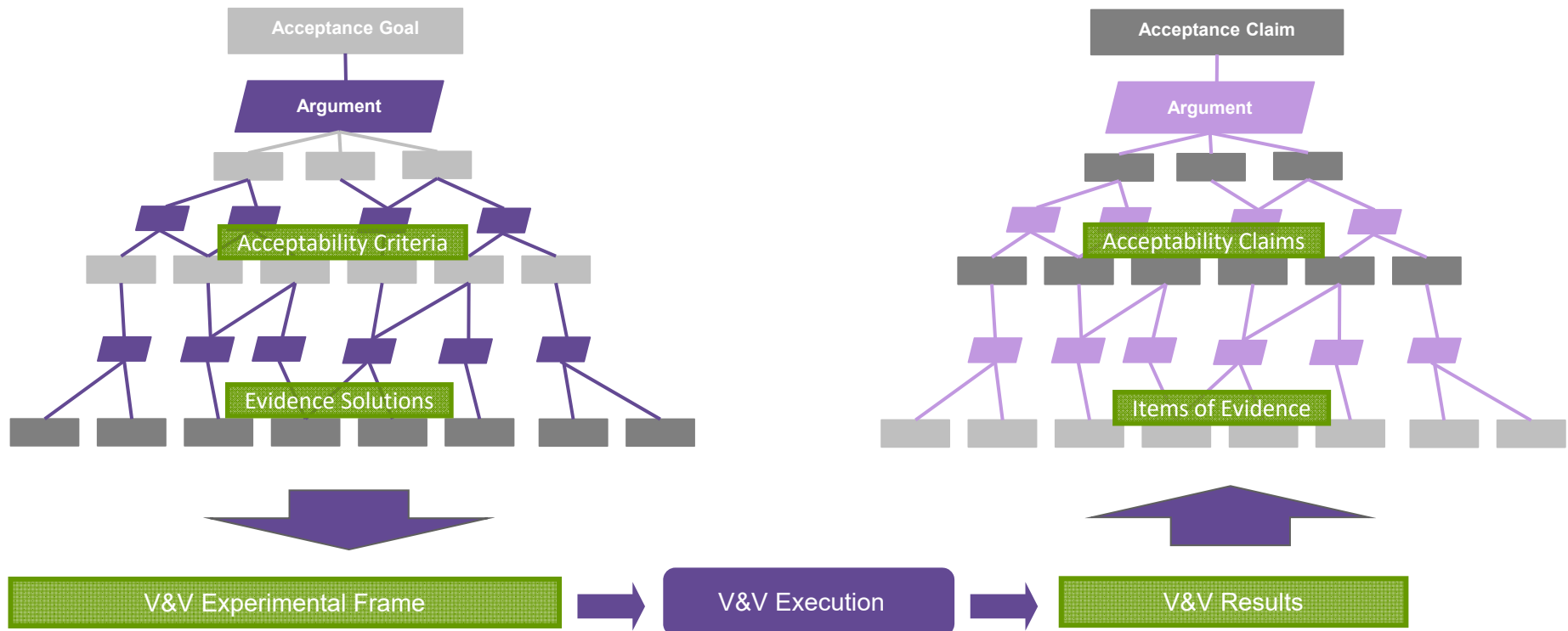
Target audience: POM staff

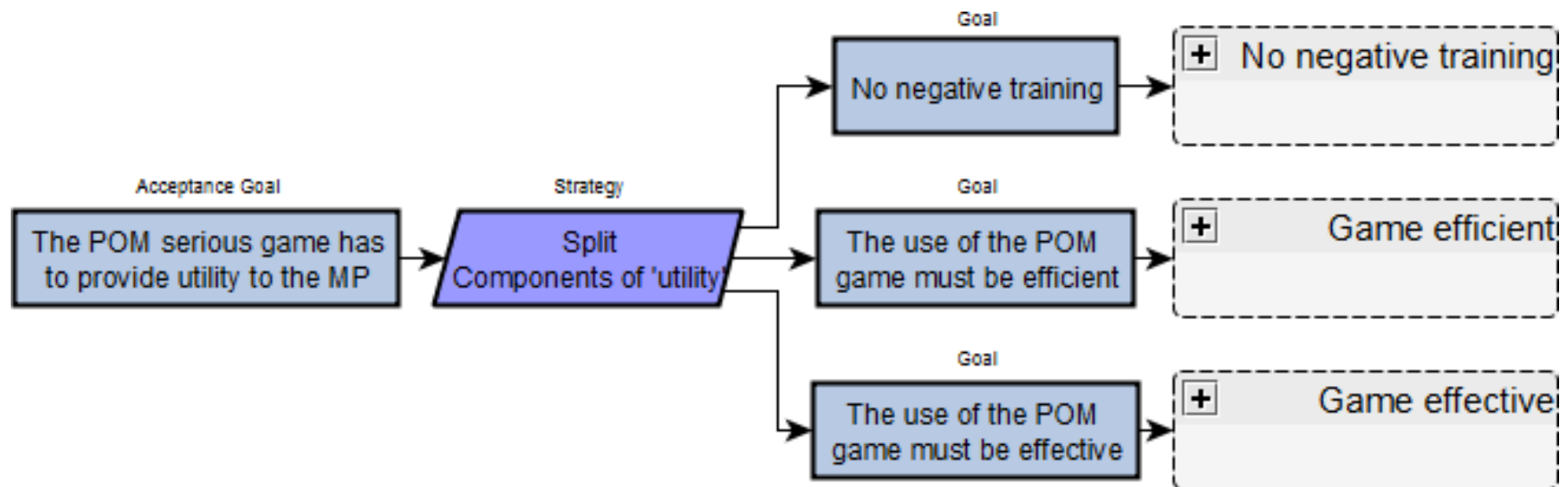
Demonstrator POM game made by TNO and MP

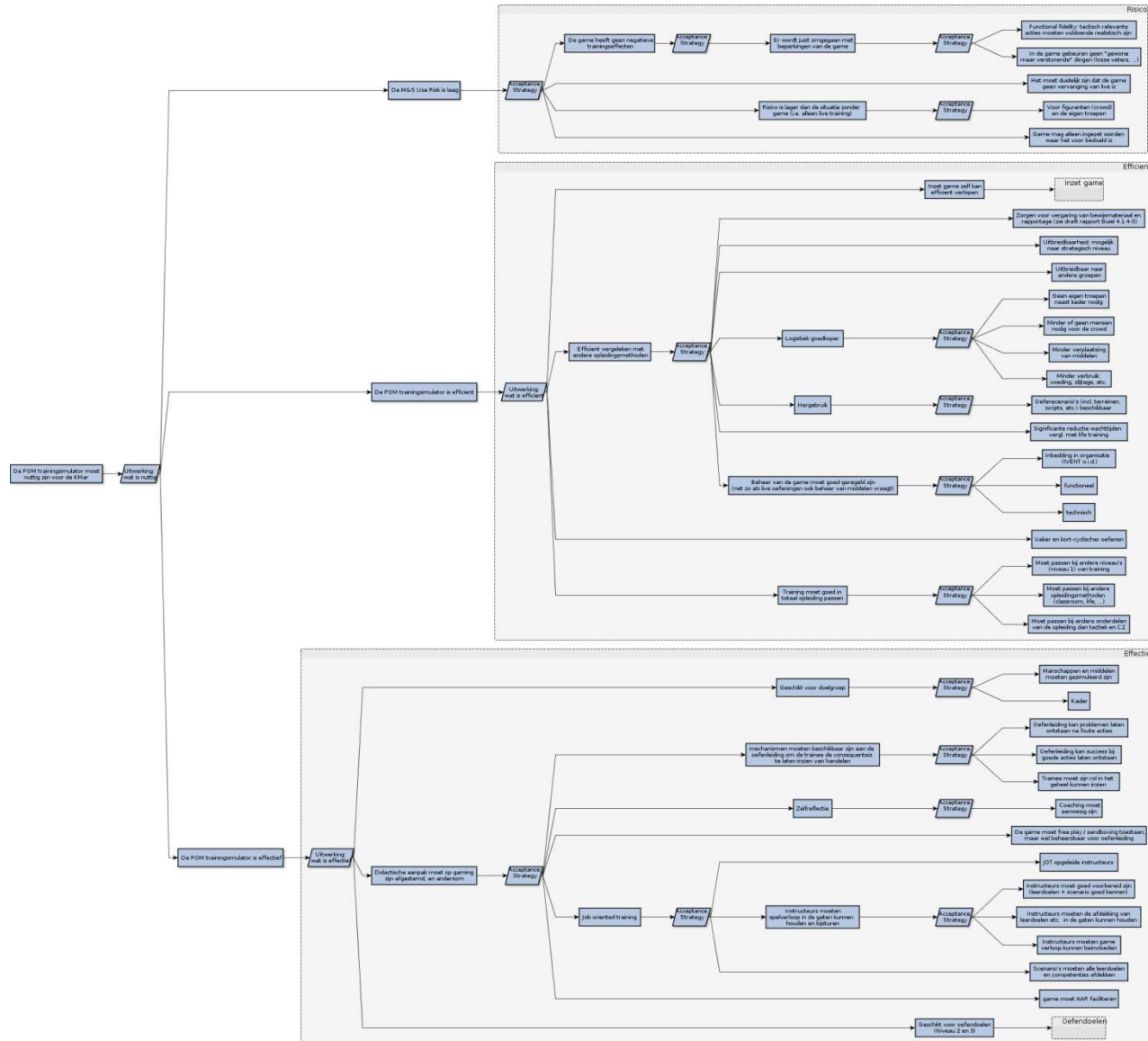


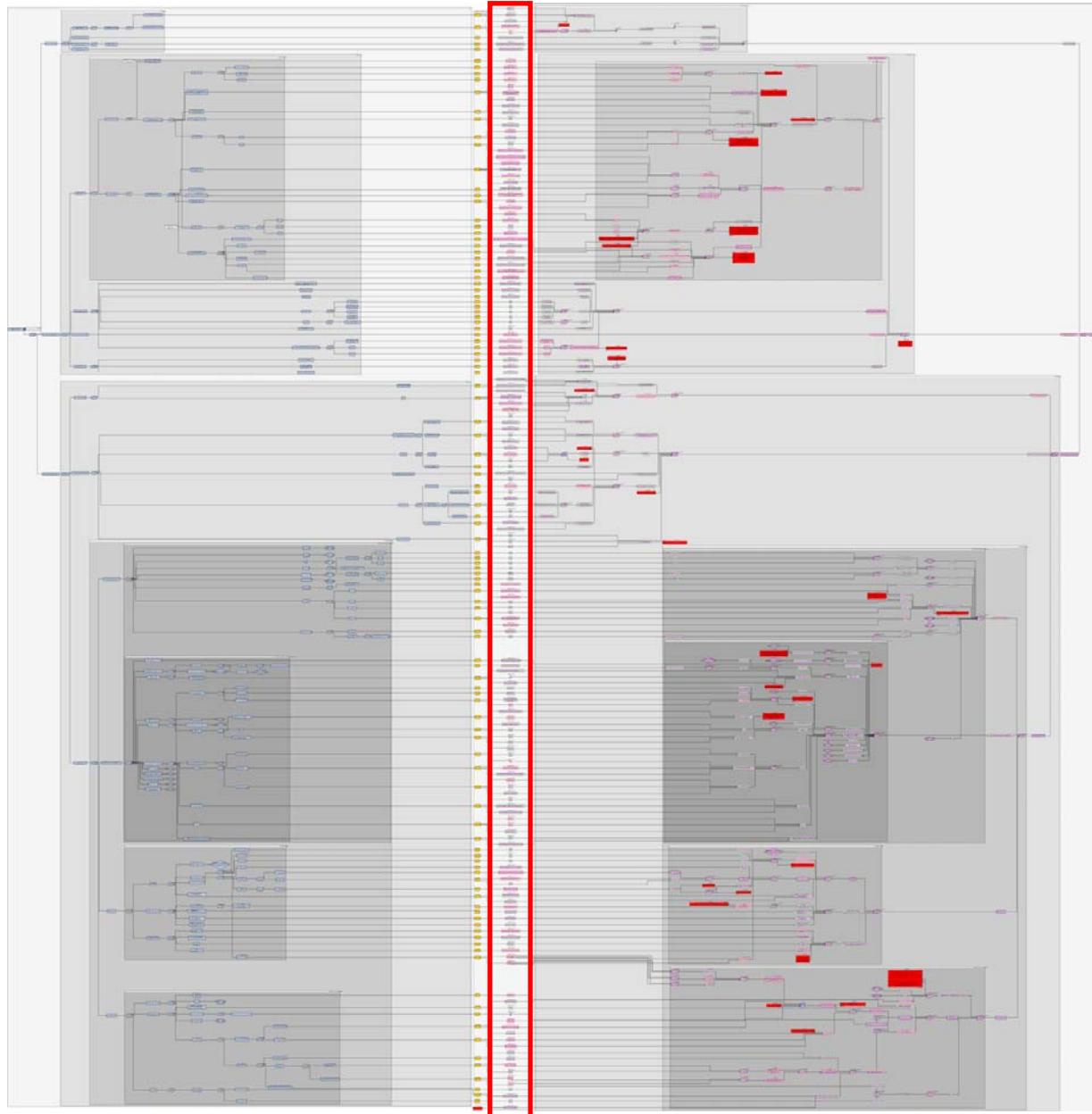
Scenario(s)







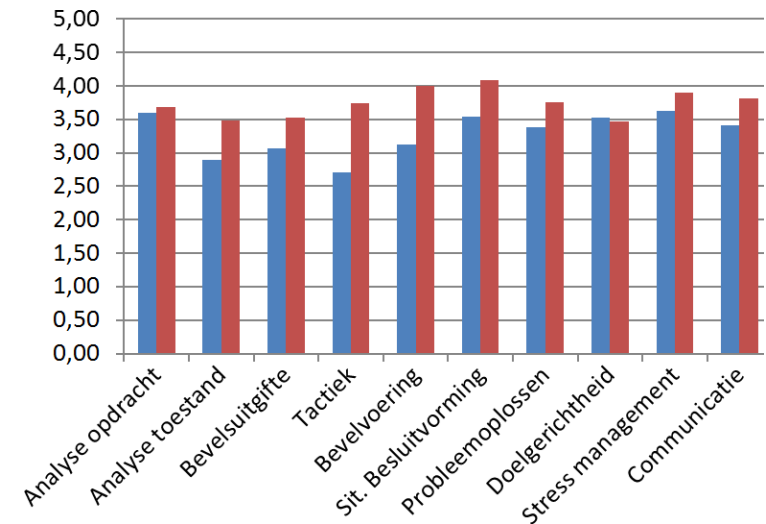




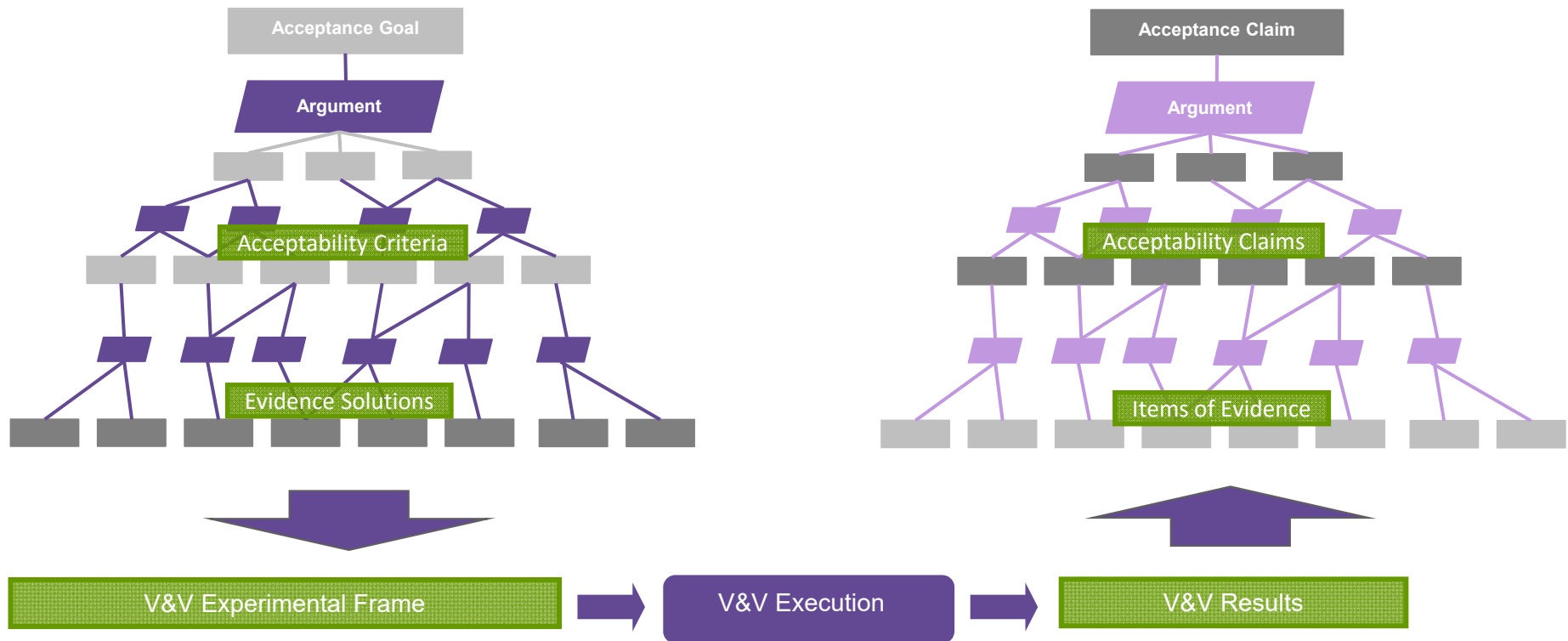
Resultaten

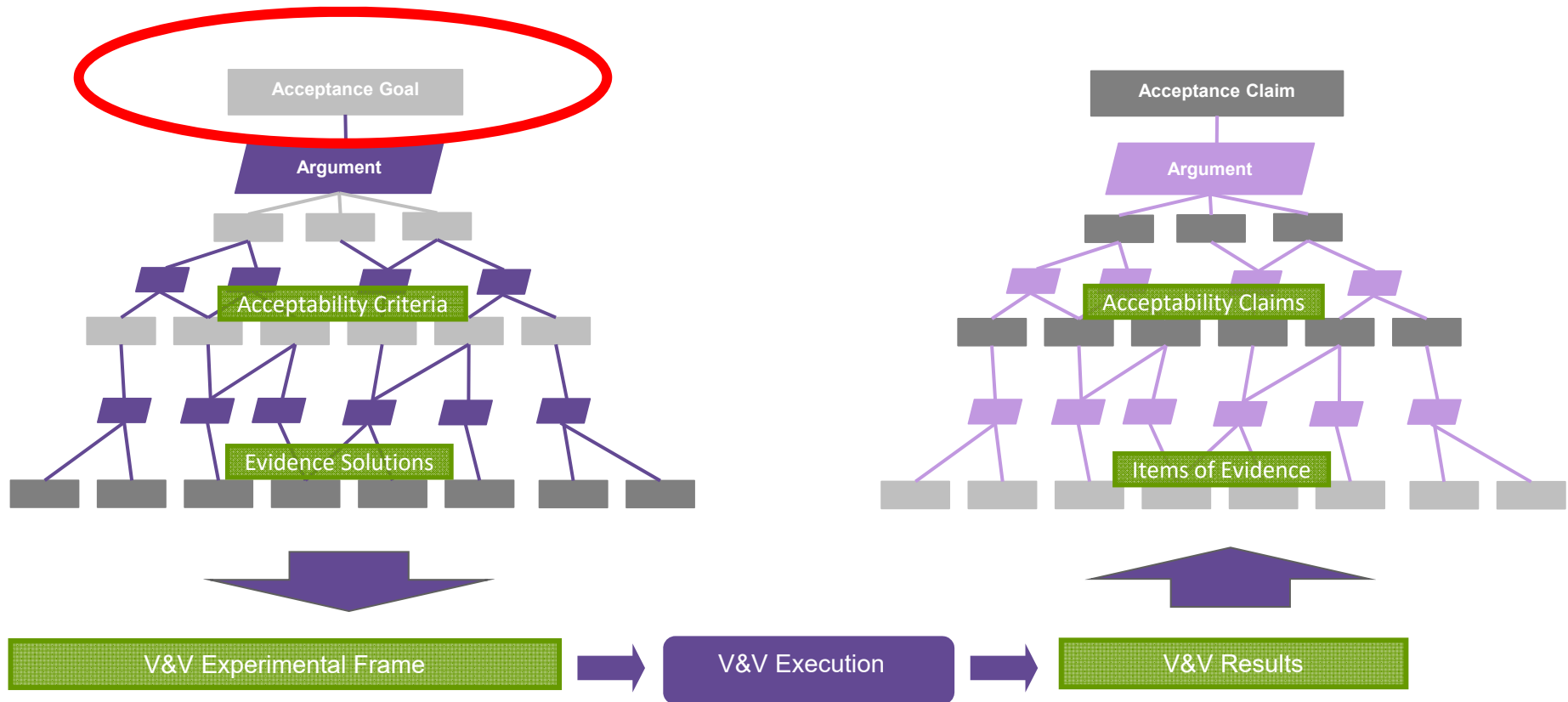
Trainingswaarde aangetoond
→ Efficiëntere training

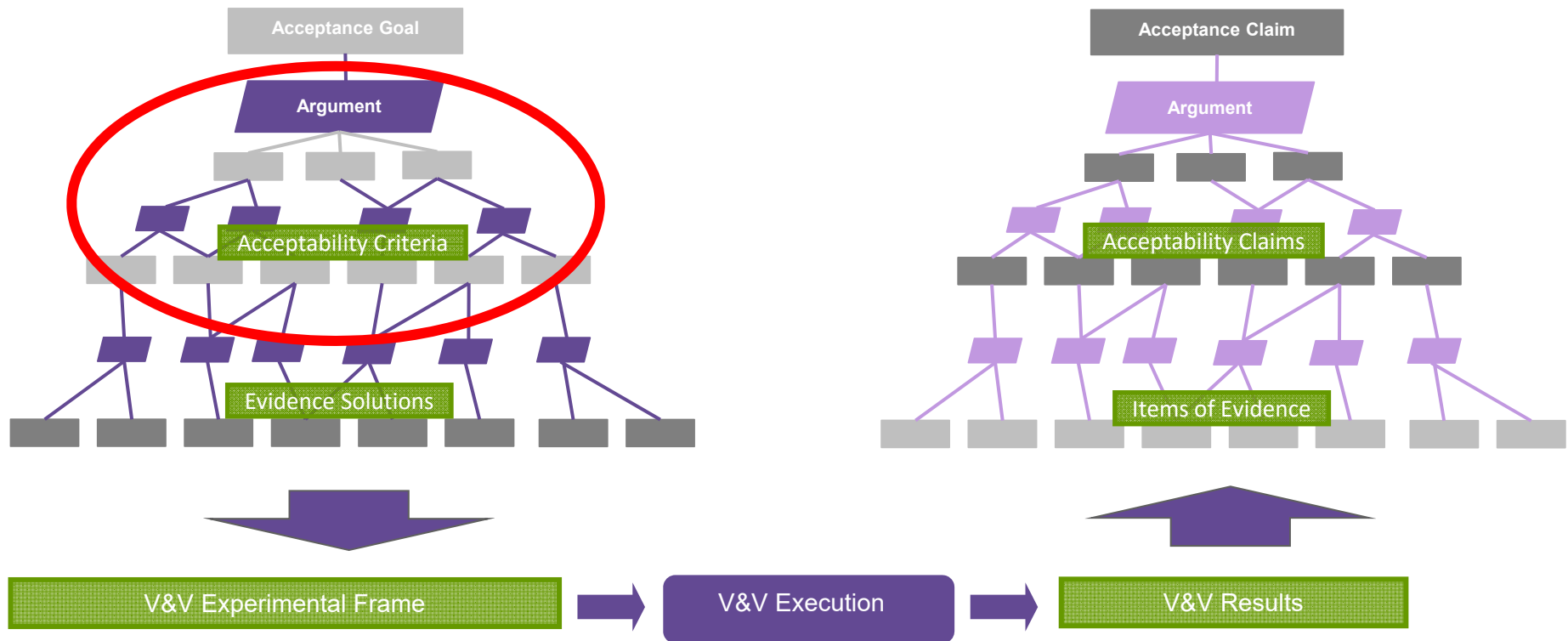
- Bugs gevonden
- Verbeteringen in de game
- Organisatorische aanpassingen
- Afstemming lesprogramma's
- Beheer & onderhoud

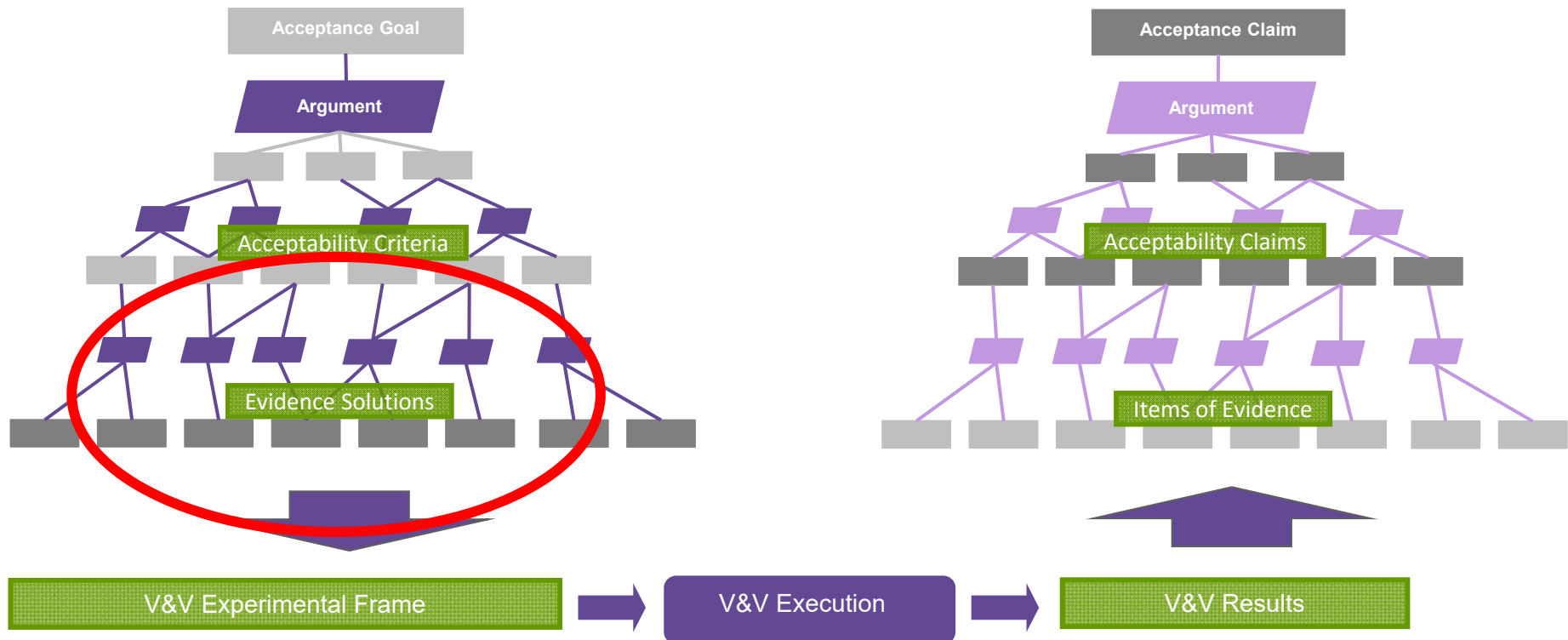


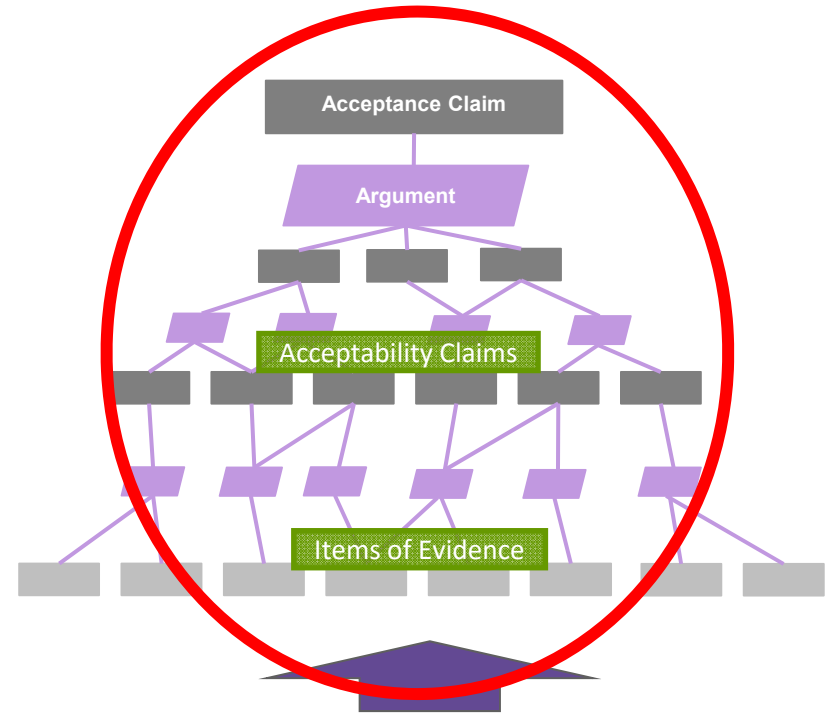
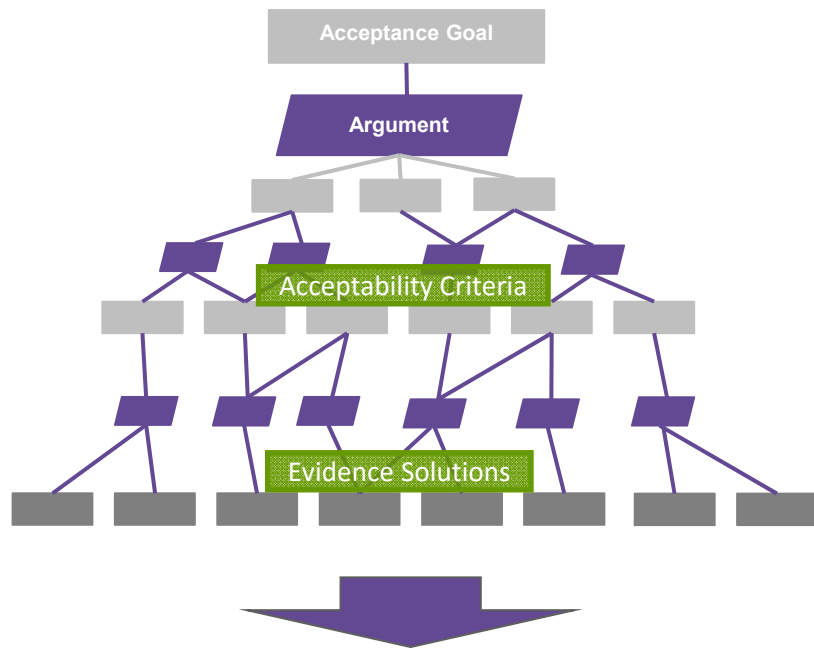
Handvatten managen van overgebleven risico's









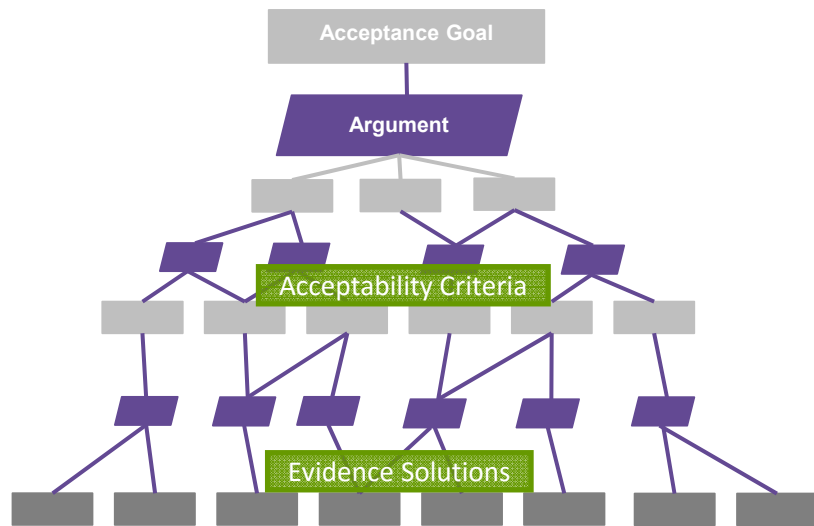


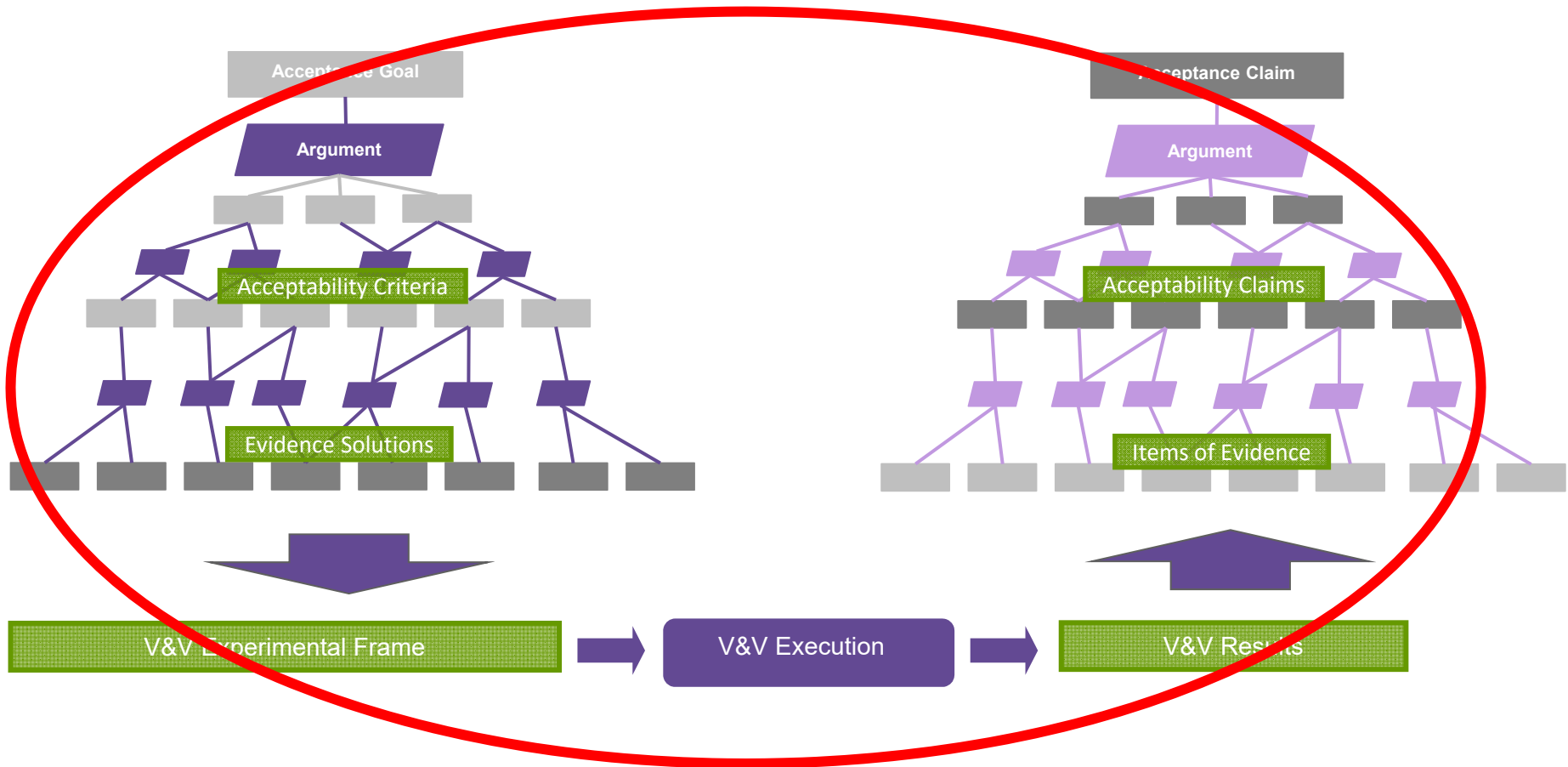
V&V Experimental Frame

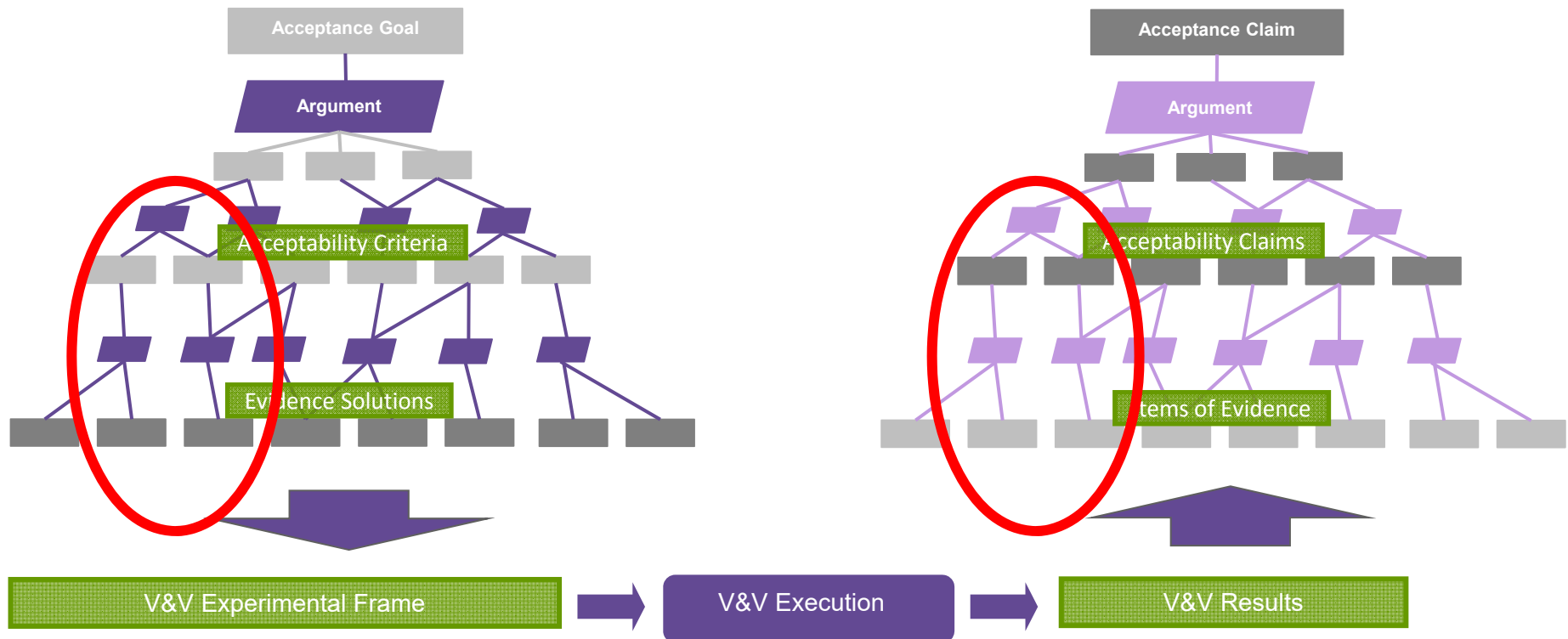
V&V Execution

V&V Results









Remember two things

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