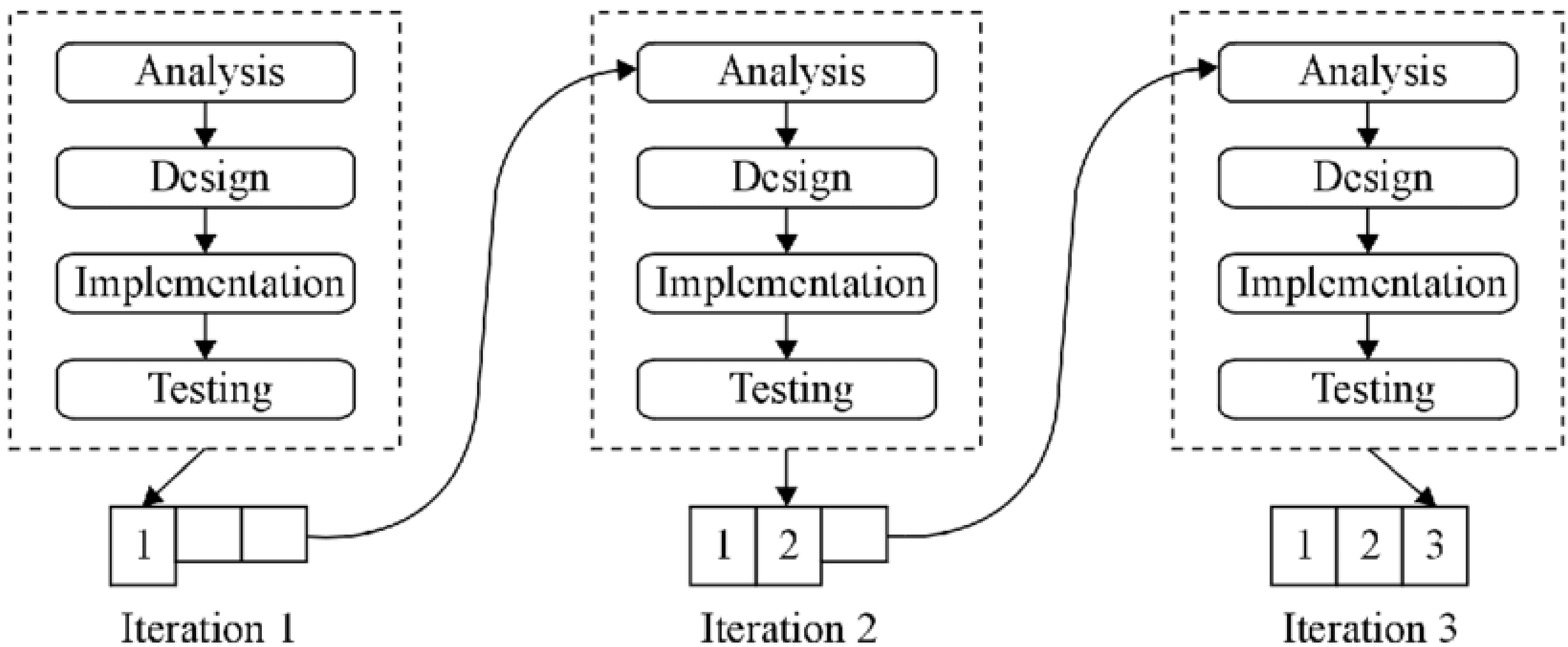


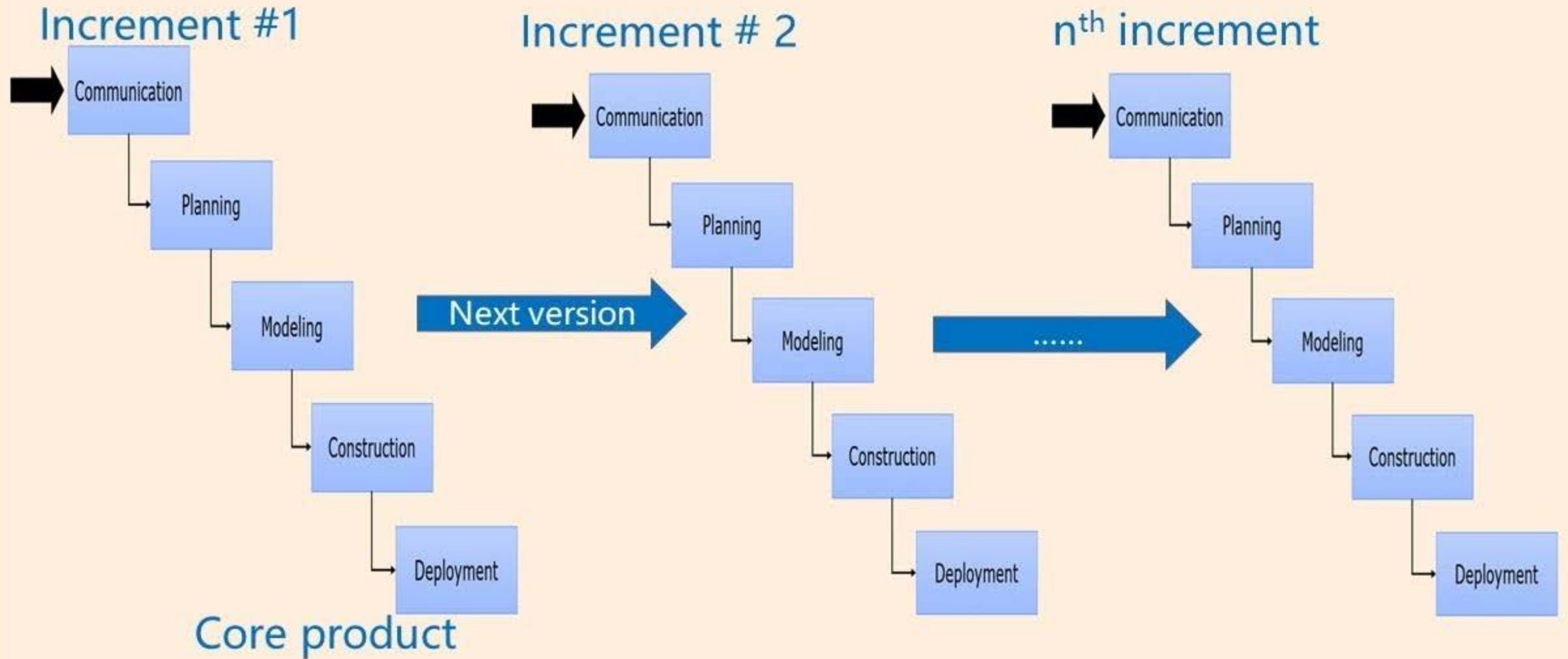
Agile Systems Engineering

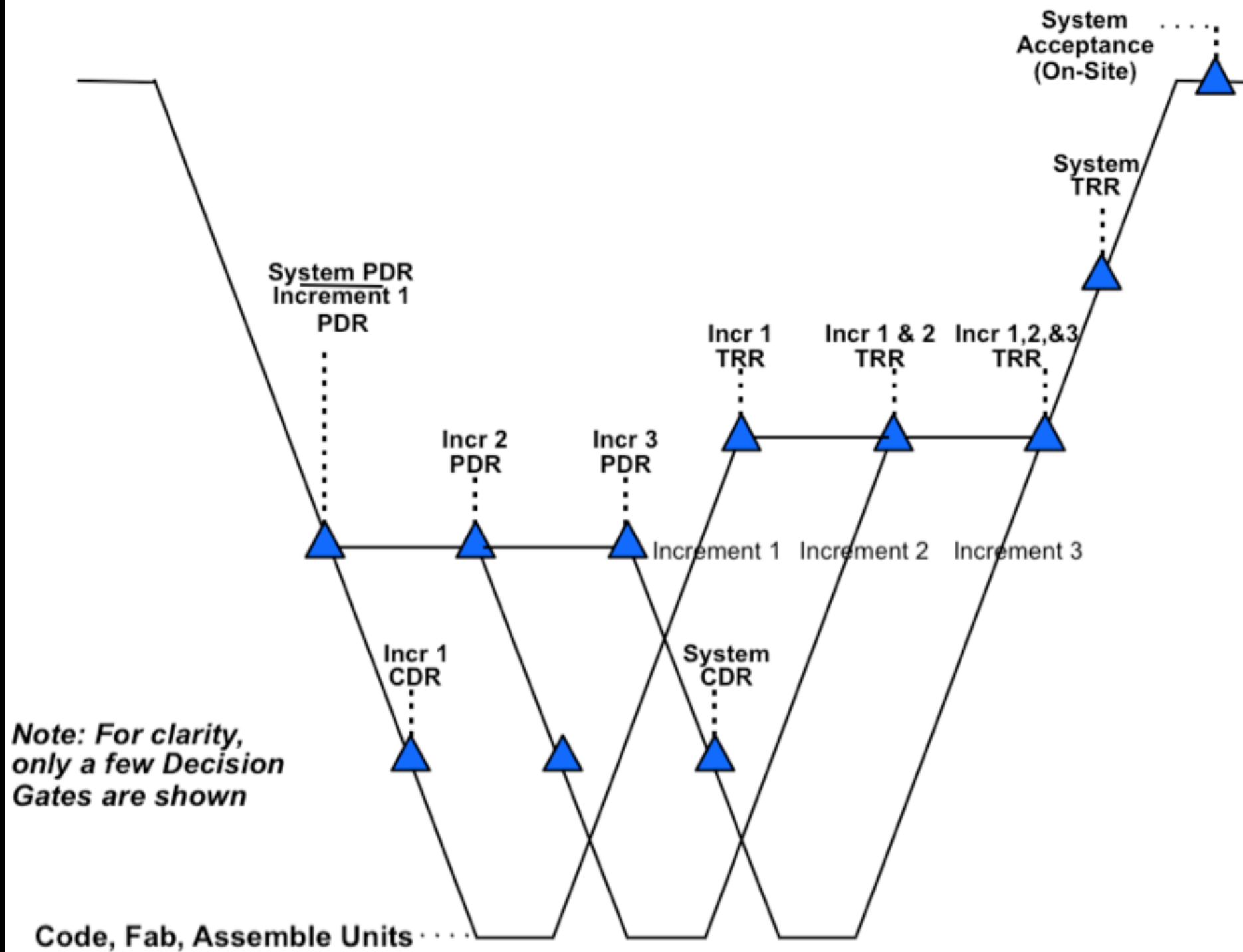
– Modern Lifecycles –



Incremental Process Model

Software Engineering LEC 6

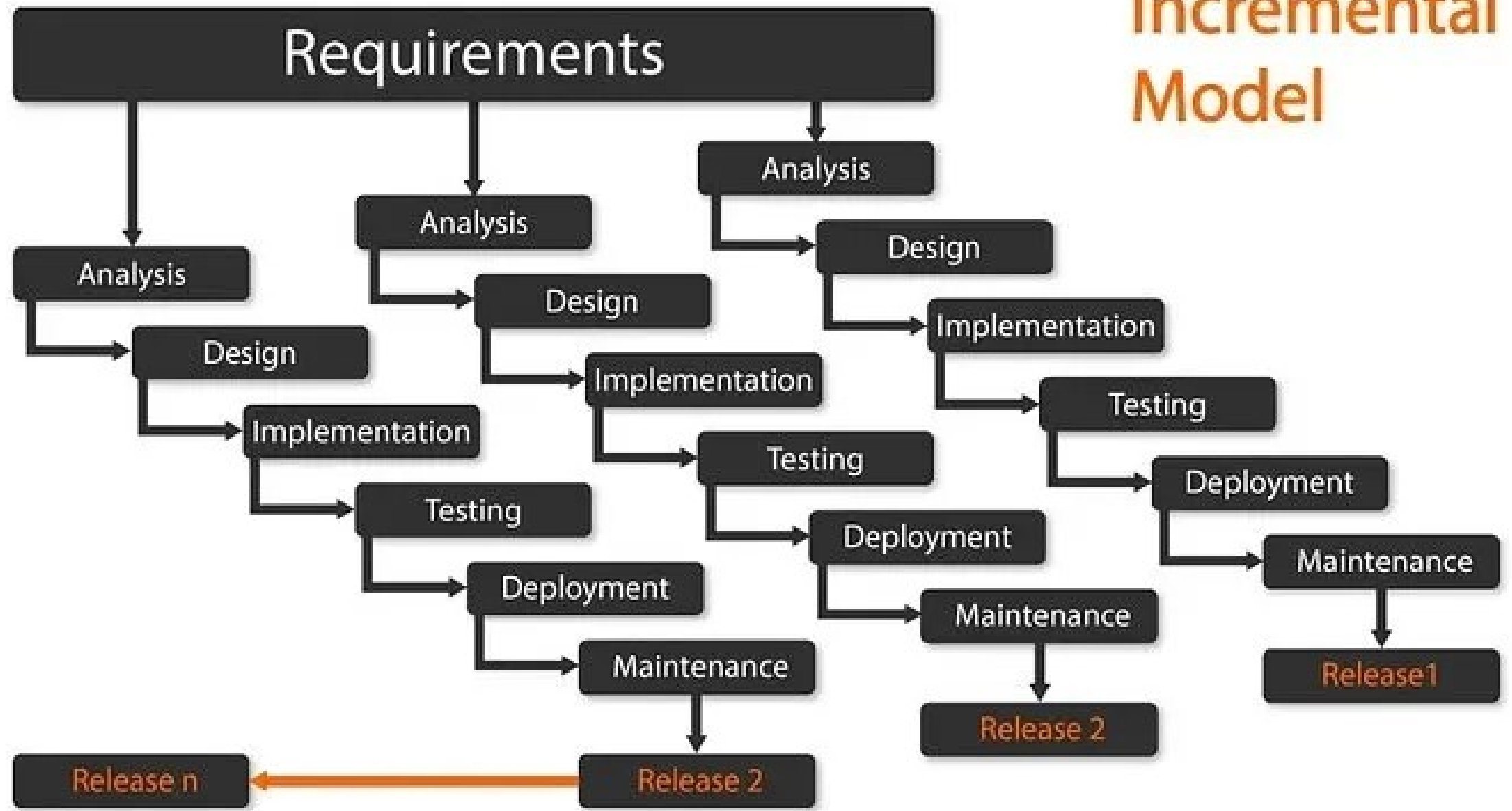


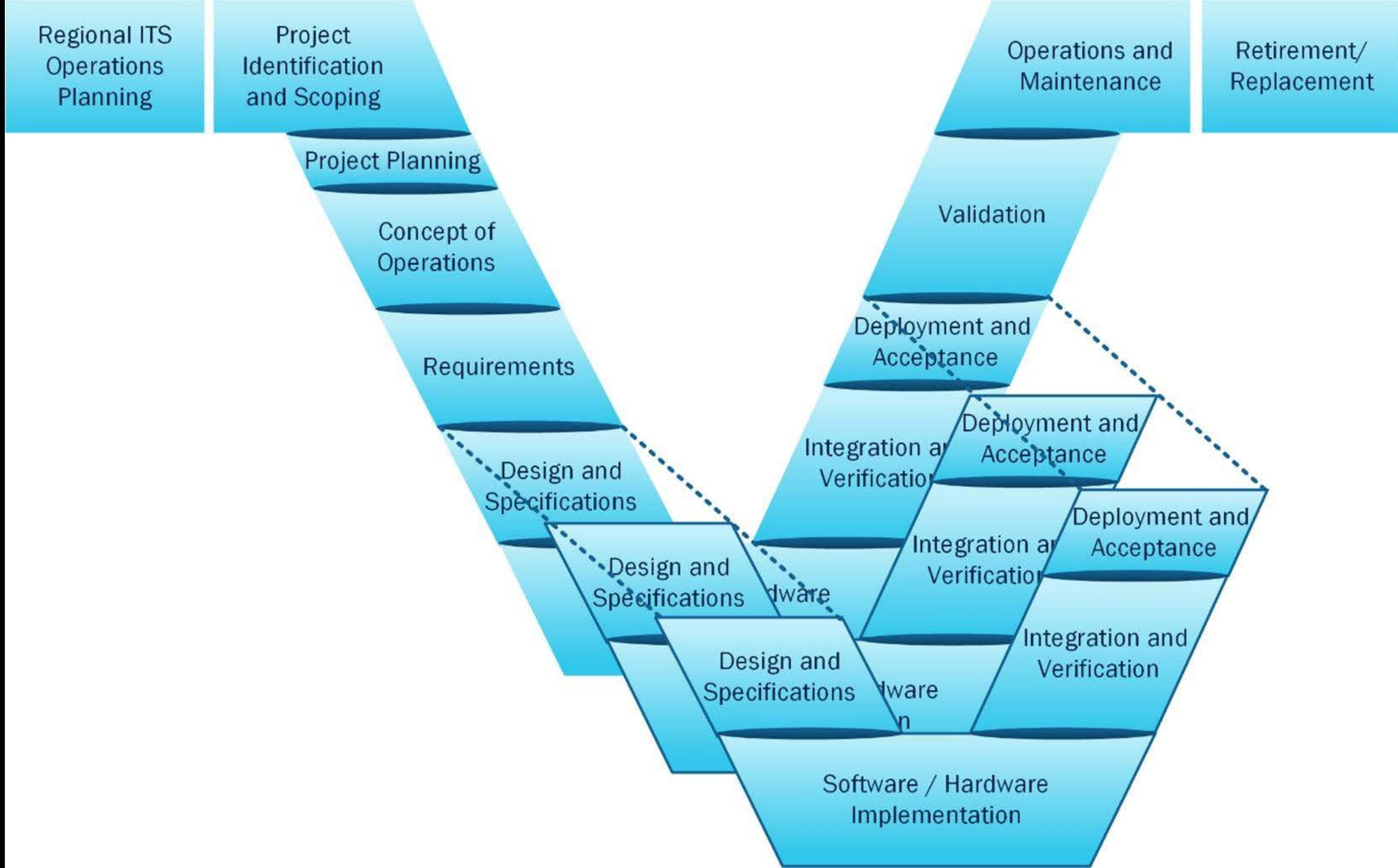


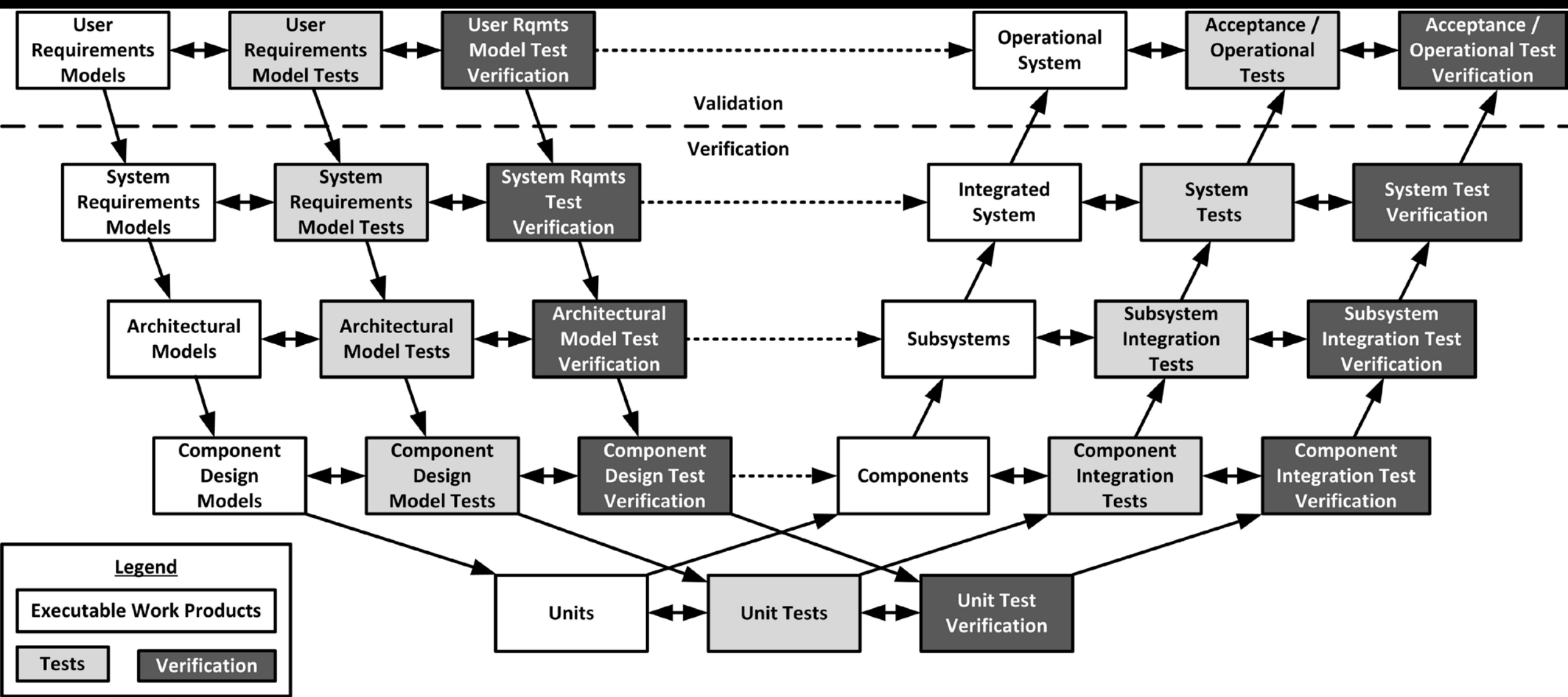
*Note: For clarity,
only a few Decision
Gates are shown*

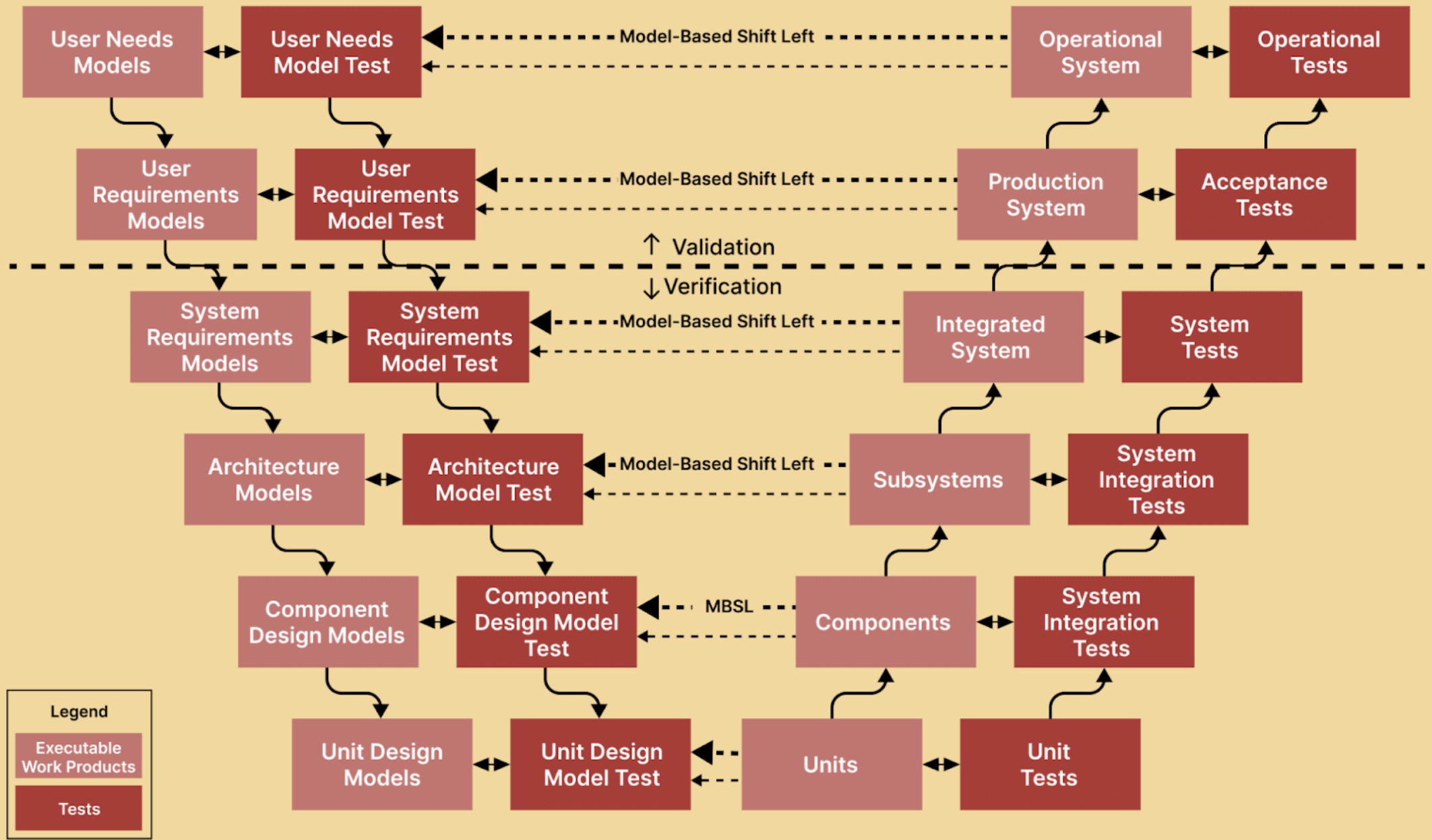
Code, Fab, Assemble Units

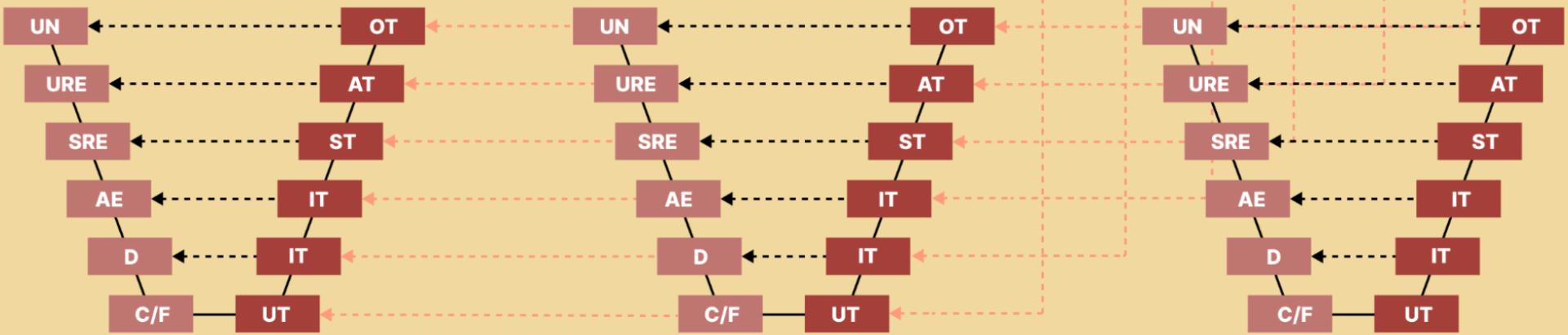
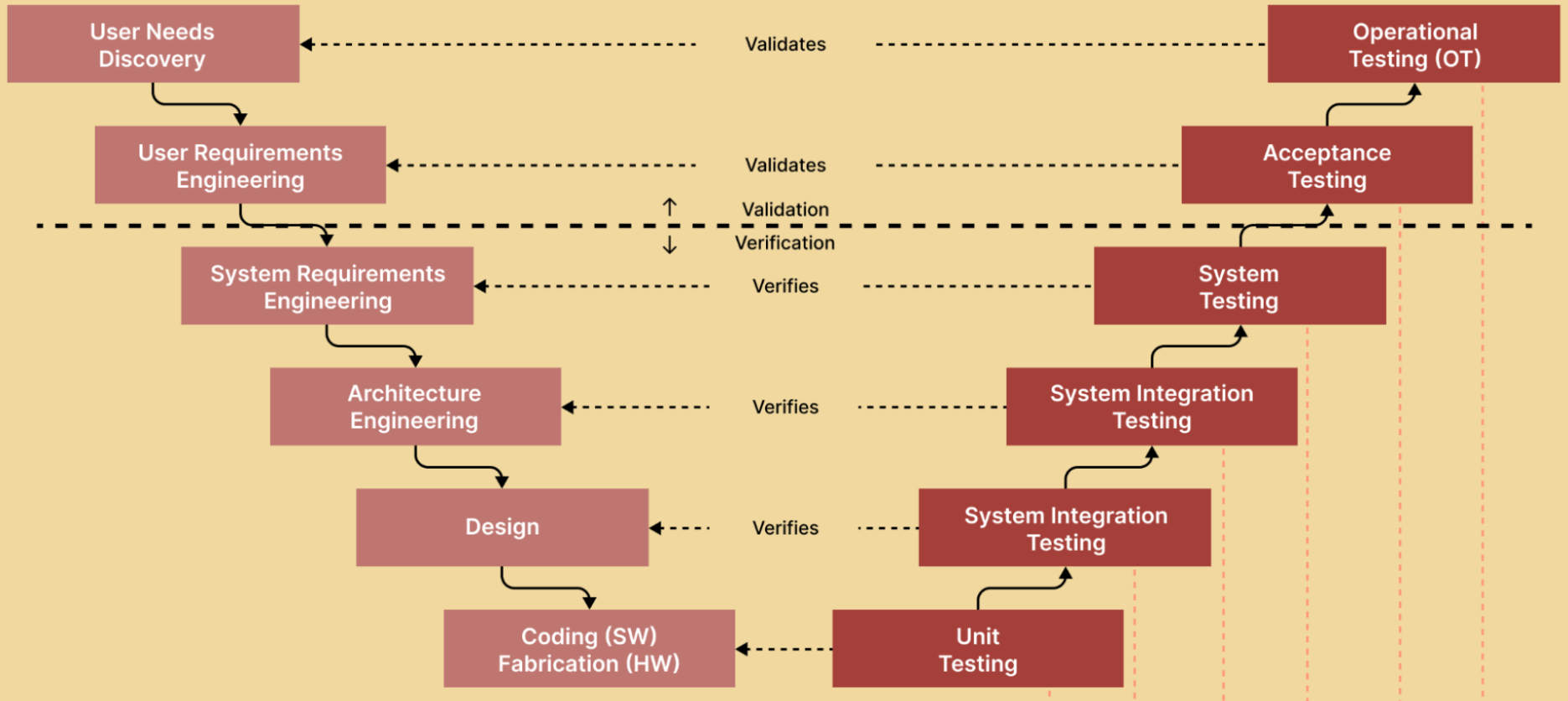
Incremental Model



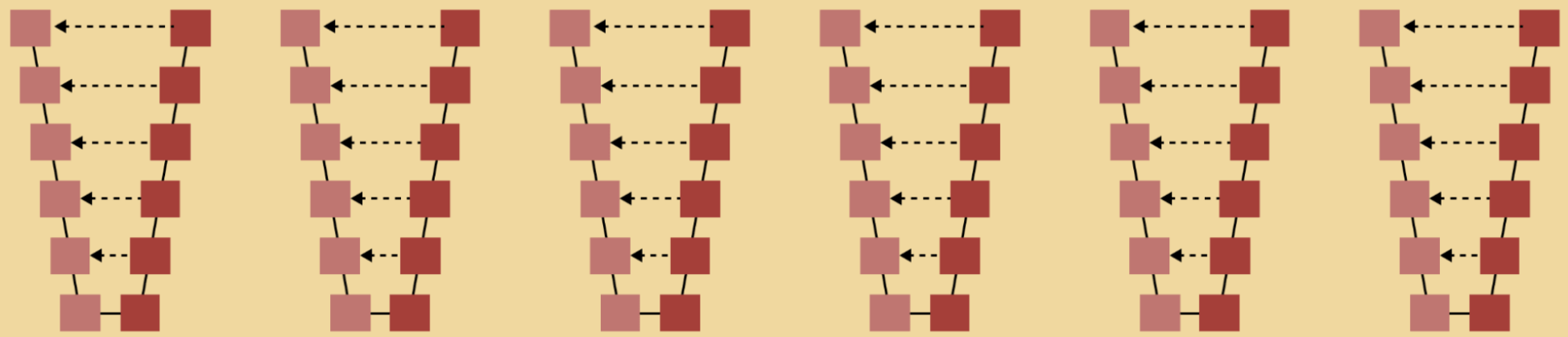
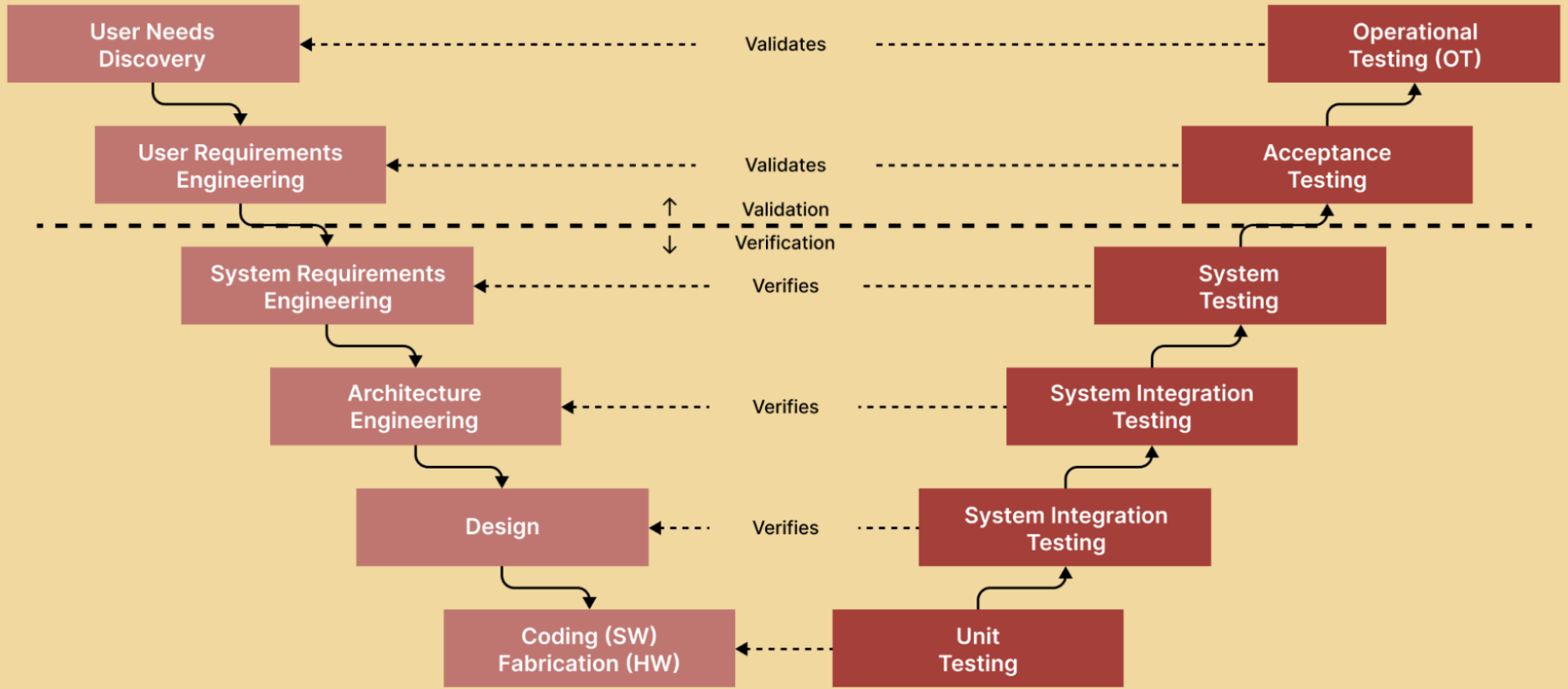




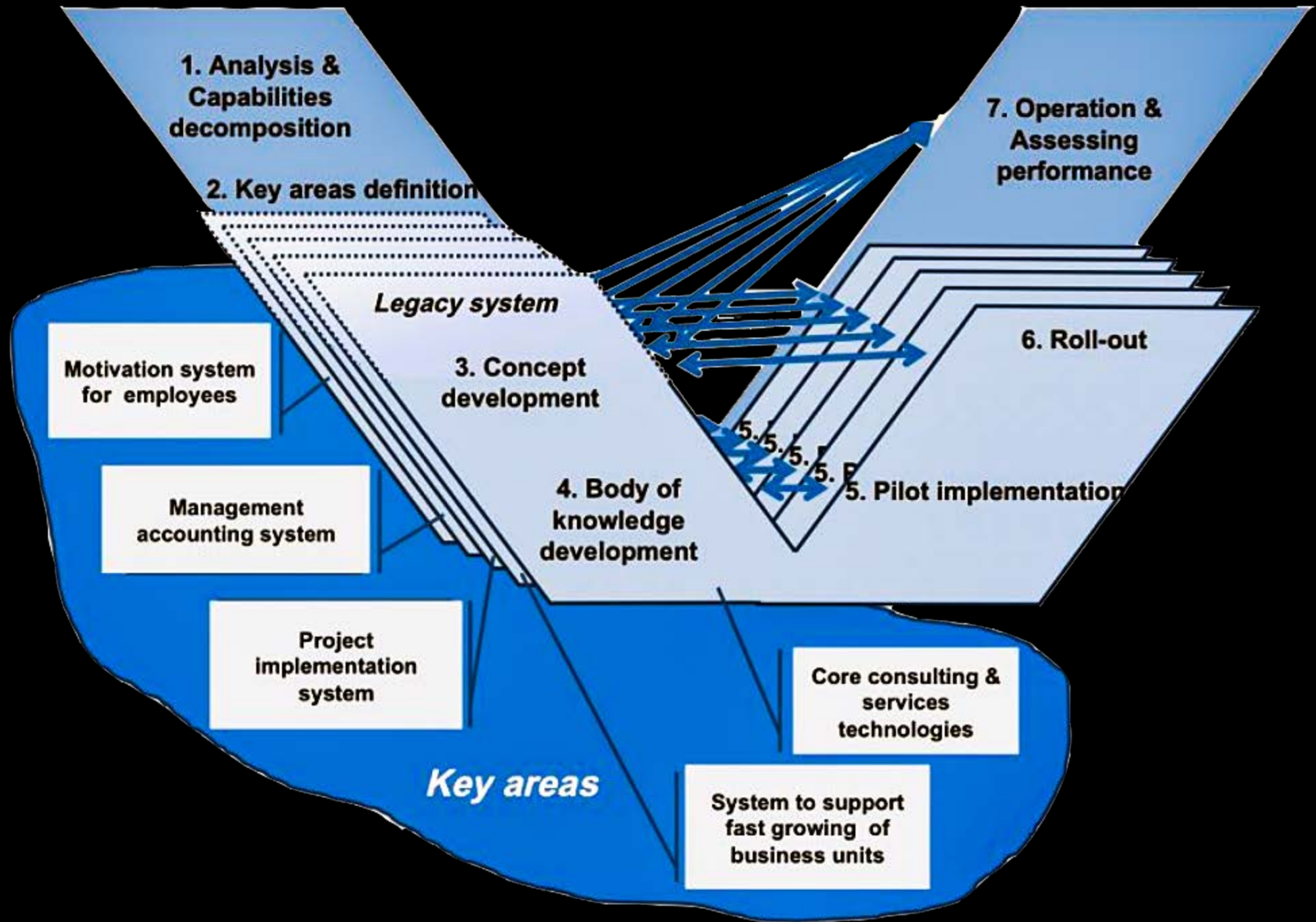


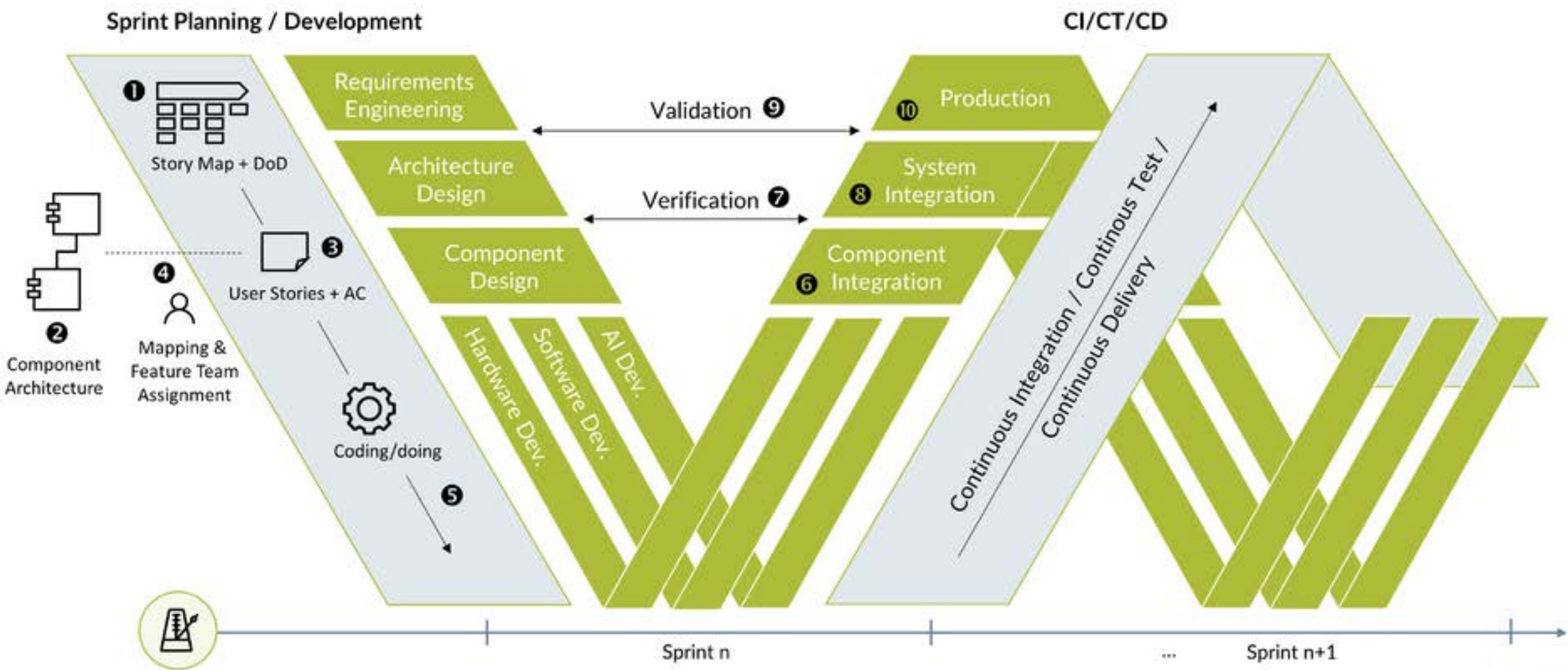


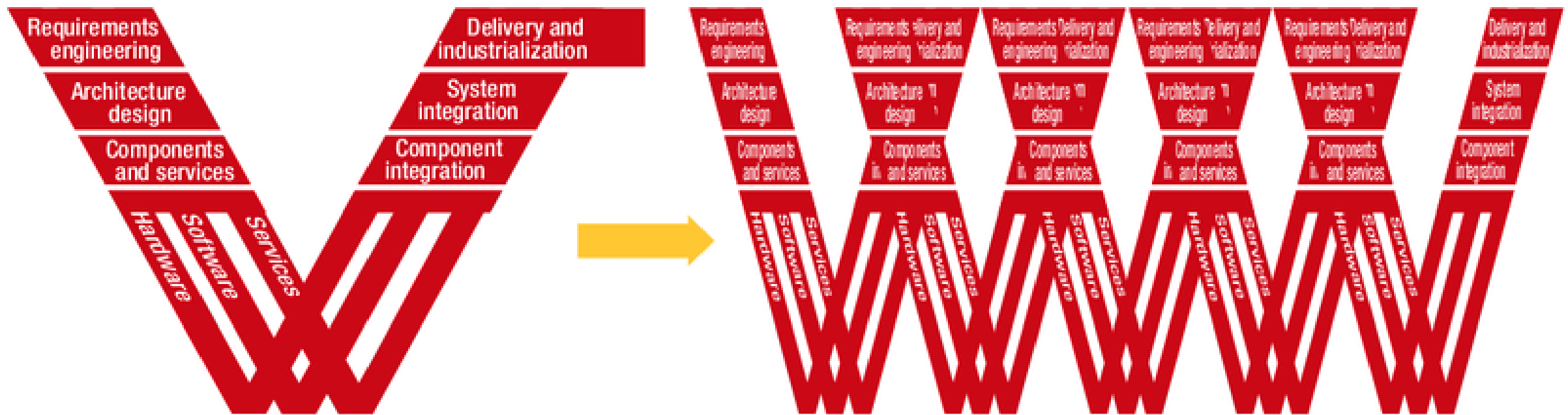
Incremental Shift Left ←



← Agile/DevOps Shift Left





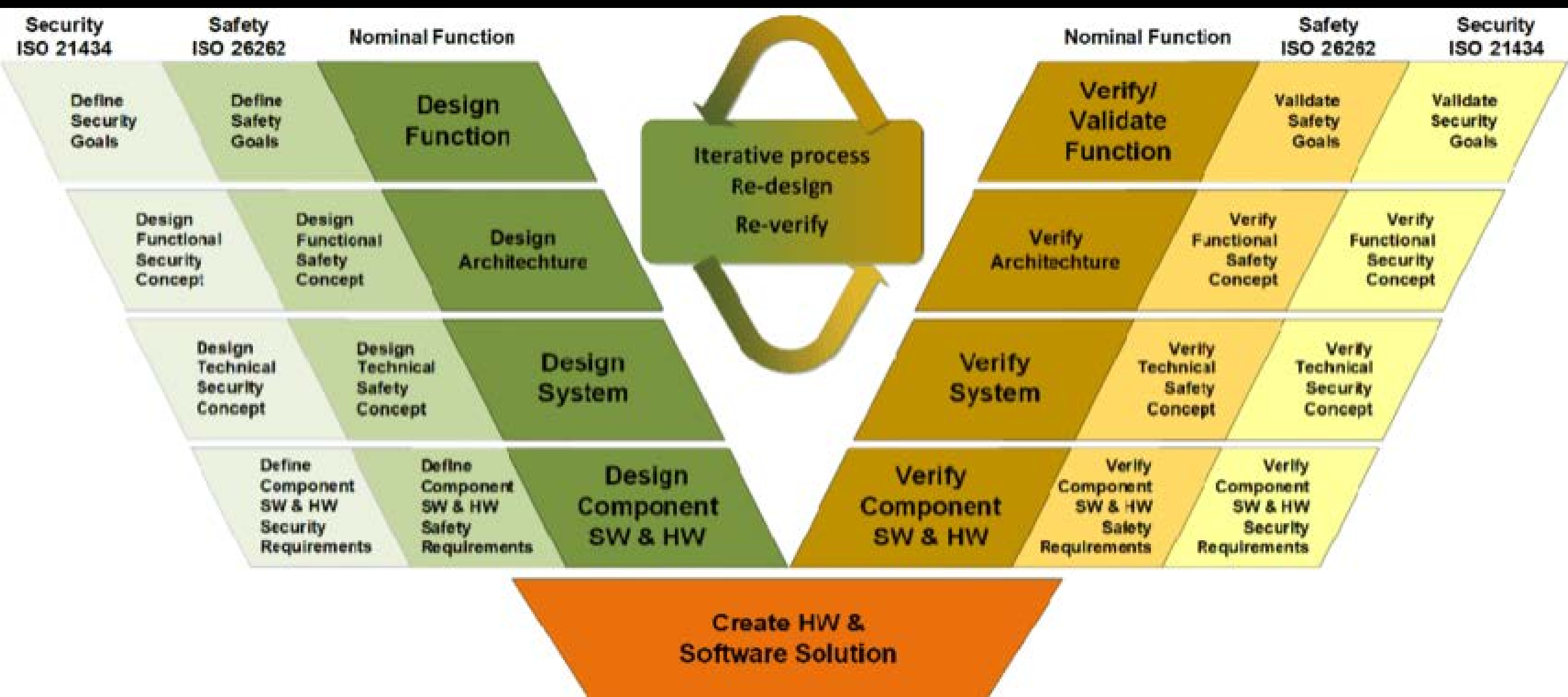


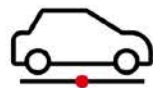
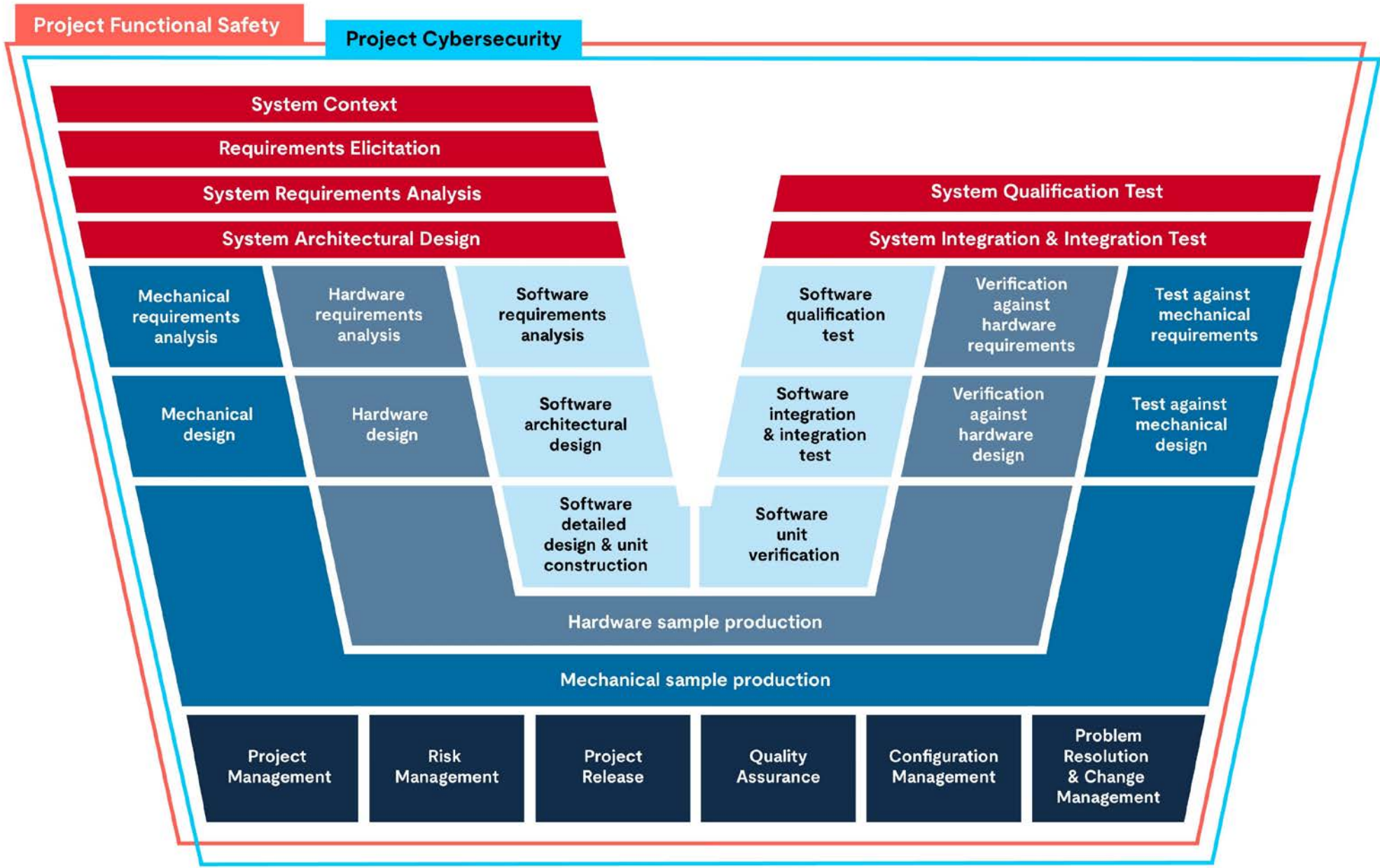
Classic V model for systems development:

- Goal: Collaborative development of safety-critical functional components
- Isolated components with signal-oriented communication
- Hardware-driven abstraction layers
- Organically grown synchronization points between hardware, software, and emerging services
- Heavily safety-oriented processes with insufficient flexibility and agility

Vector LeanSAFE for critical systems:

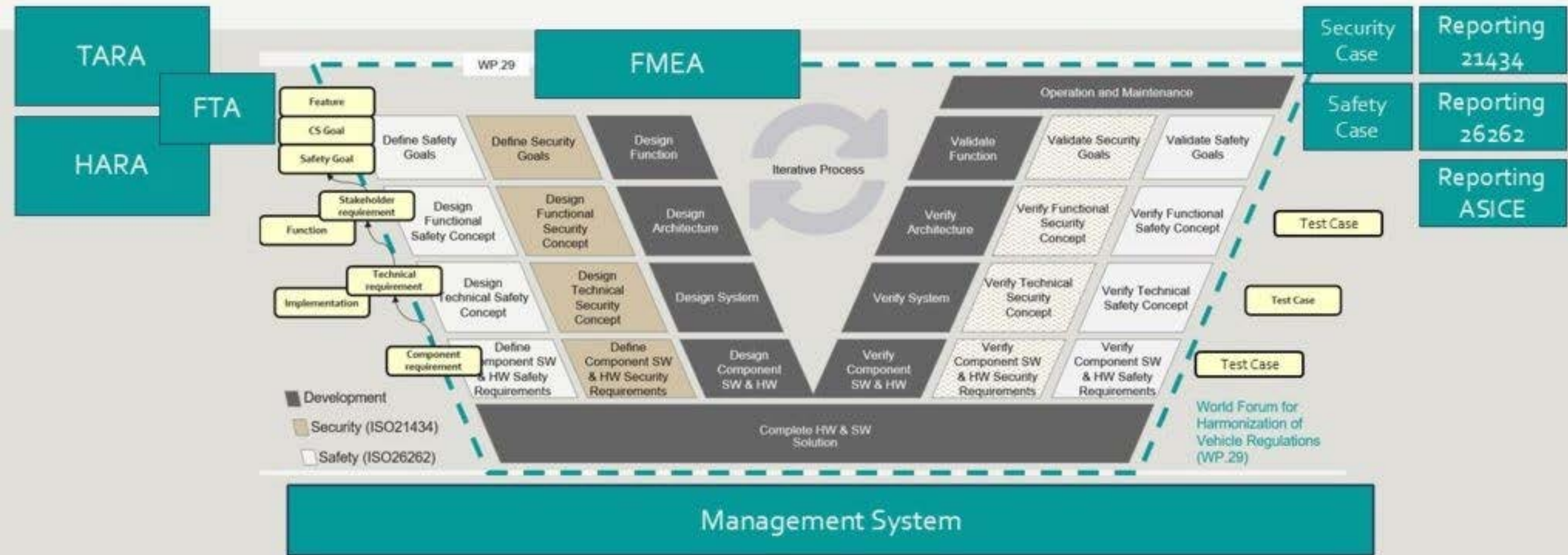
- Goal: Flexible collaboration across the lifecycle with adaptive architectures and assured quality
- Service-oriented three-tier approach (sensor and actor preprocessing, high-performance middleware, and cloud and over-the-air upgrades)
- Full vertical abstraction layers with clear interfaces and synchronization points
- Flexibility and agility while pertaining to safety and cybersecurity demands





Automotive Process Framework developed using stages.

Polarion Automotive setup for Compliance



Citations – In Order of Appearance

https://www.researchgate.net/figure/terative-and-incremental-software-methodology_fig3_320927596

<https://www.youtube.com/watch?v=aGEio6CJaFg>

https://sebokwiki.org/wiki/Incremental_Life_Cycle_Model

<https://newline.tech/incremental-model-of-software-development-life-cycle>

https://ops.fhwa.dot.gov/seits/sections/section2/2_7.html

<https://insights.sei.cmu.edu/blog/using-v-models-for-testing>

<https://www.lambdatest.com/learning-hub/shift-left-testing>

<https://www.lambdatest.com/learning-hub/shift-left-testing>

<https://www.lambdatest.com/learning-hub/shift-left-testing>

<https://imgbin.com/png/UZg9047e/diagram-systems-engineering-v-model-png>

https://aiotplaybook.org/index.php?title=Agile_V-Model

https://www.researchgate.net/figure/FIGURE-A-Agile-development-of-critical-systems-The-classic-V-model-is-evolving-to-a-W_fig4_316945758

<https://embeddedcomputing.com/application/automotive/isosae-21434-a-joint-solution-to-the-automotive-cybersecurity-challenge>

<https://www.ul.com/de/sis/stages/stages-automotive-process-framework>

<https://www.taipuva.com/automotive>