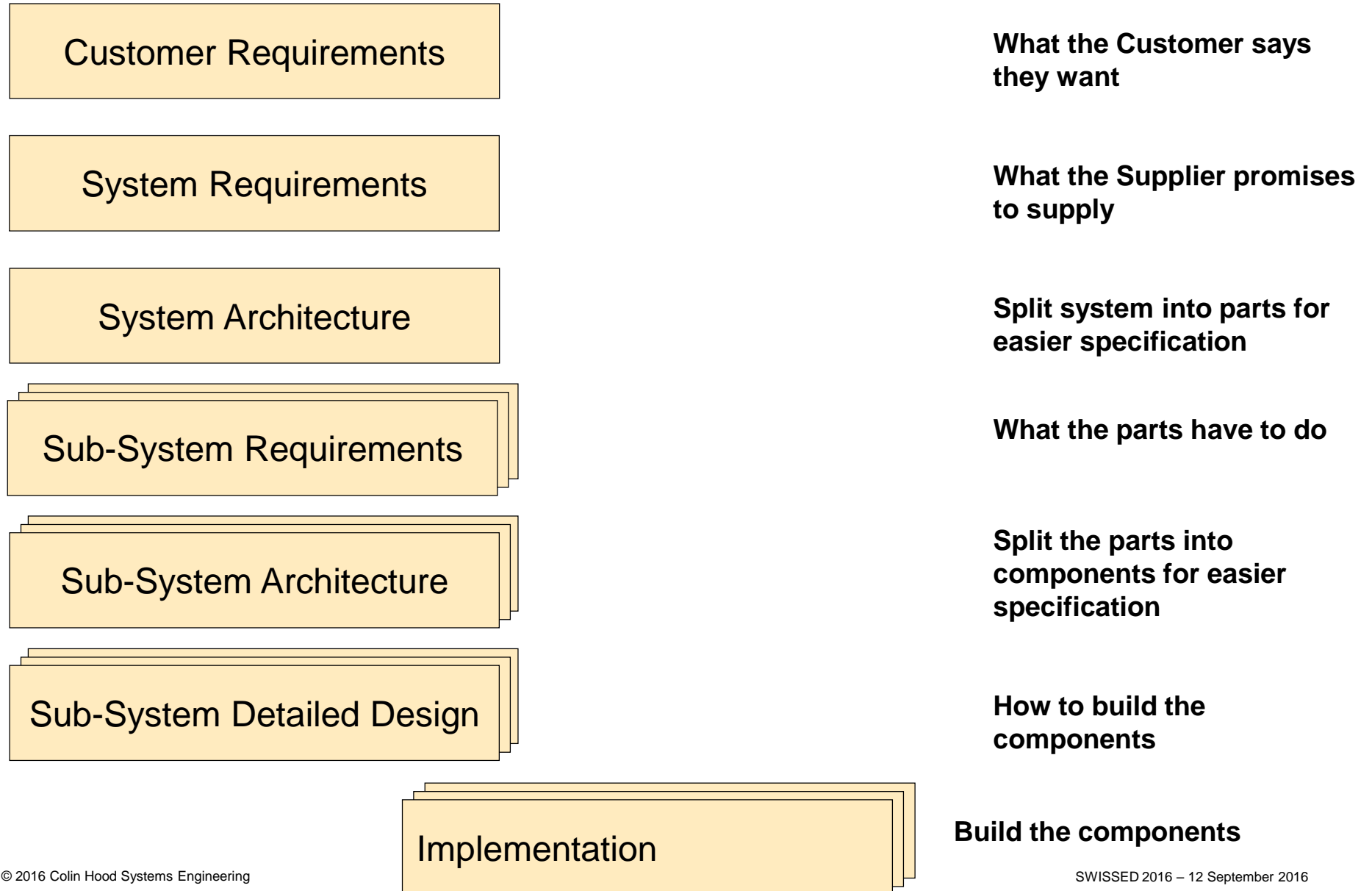


The V-Model is Dead. Long Live the V- Model

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- To explain that a V-model documents relationships between information, and does not restrict the sequence of creation of information.
- To explain that a V-model shows that larger systems can be considered to be a number of sub-systems to aid specification, and that sub-systems can be further considered to consist of a number of components to aid specification.
- A V-model also shows that components can be integrated to create sub-systems, and that sub-systems can be integrated to create systems.

A Simple Information Model



Architecture consists of...

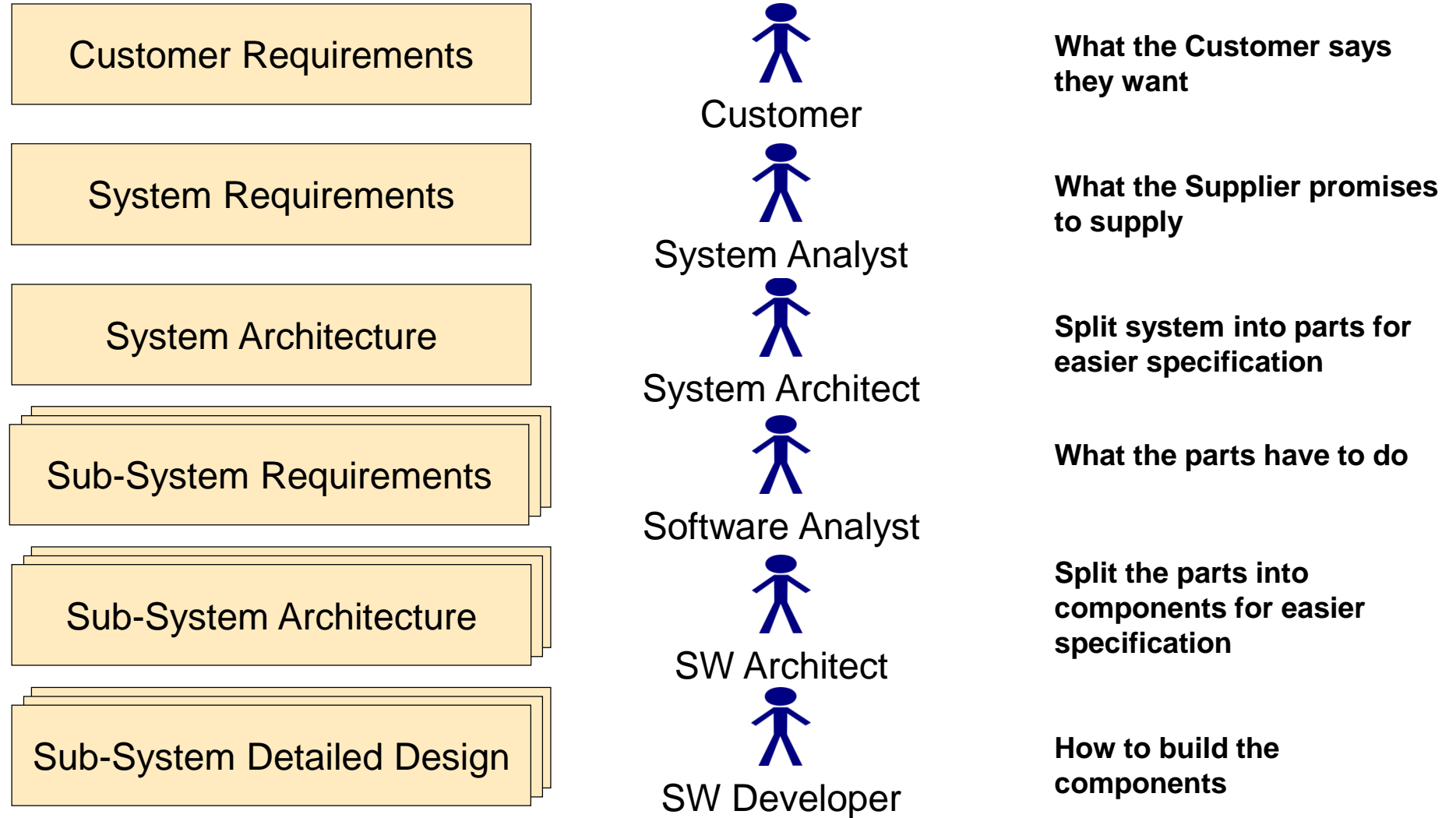
Structure	How the parts are arranged
Interfaces	How the parts talk to each other
Interaction	How the parts work together
Requirements Allocated to Parts	What the parts have to do

System Architecture

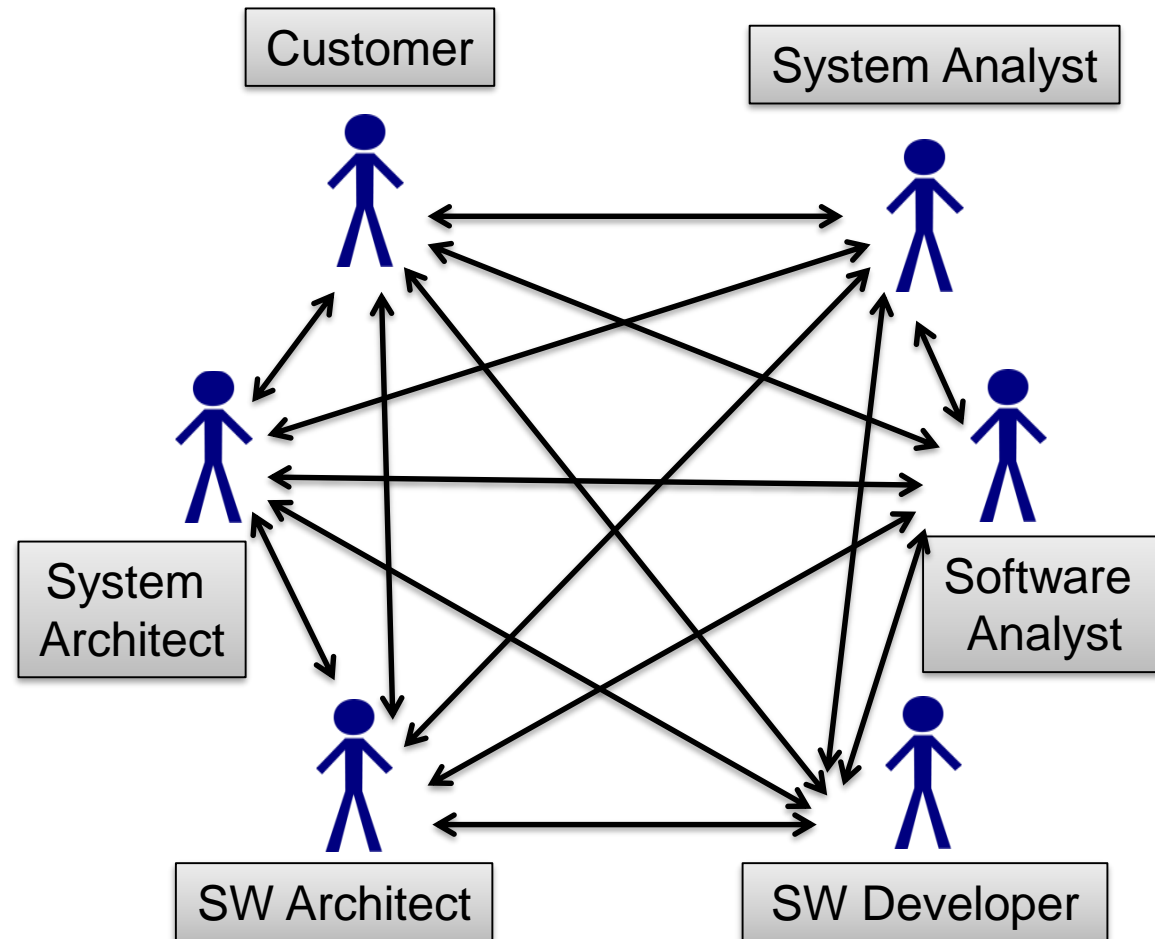
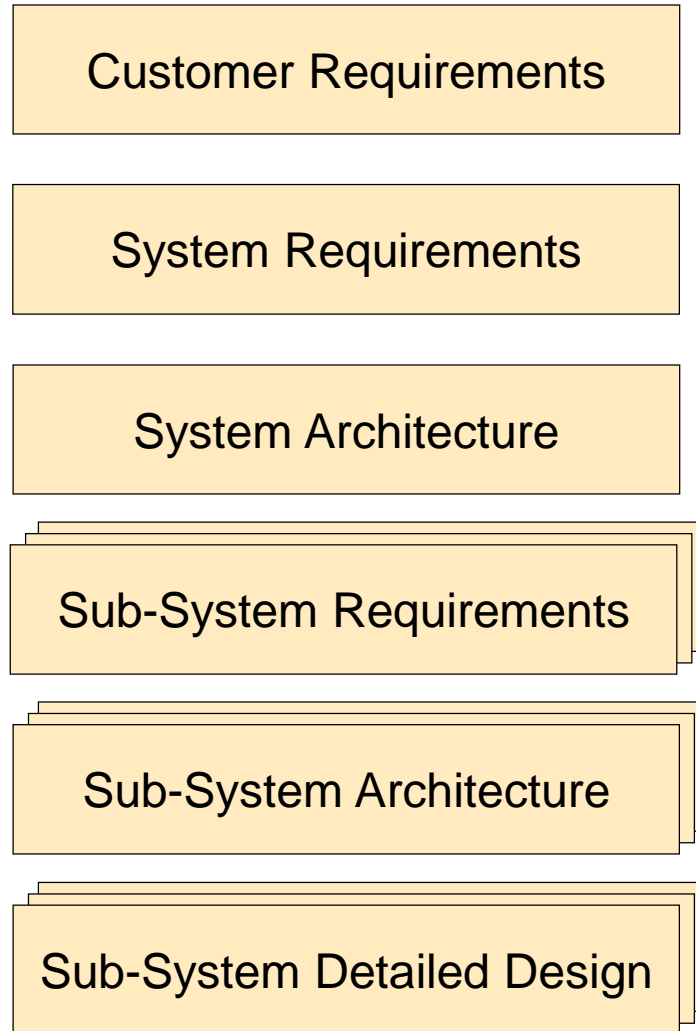
Sub-System Architecture

INCOSE have collected more than 150 correct but different definitions of architecture

Roles responsible for specification

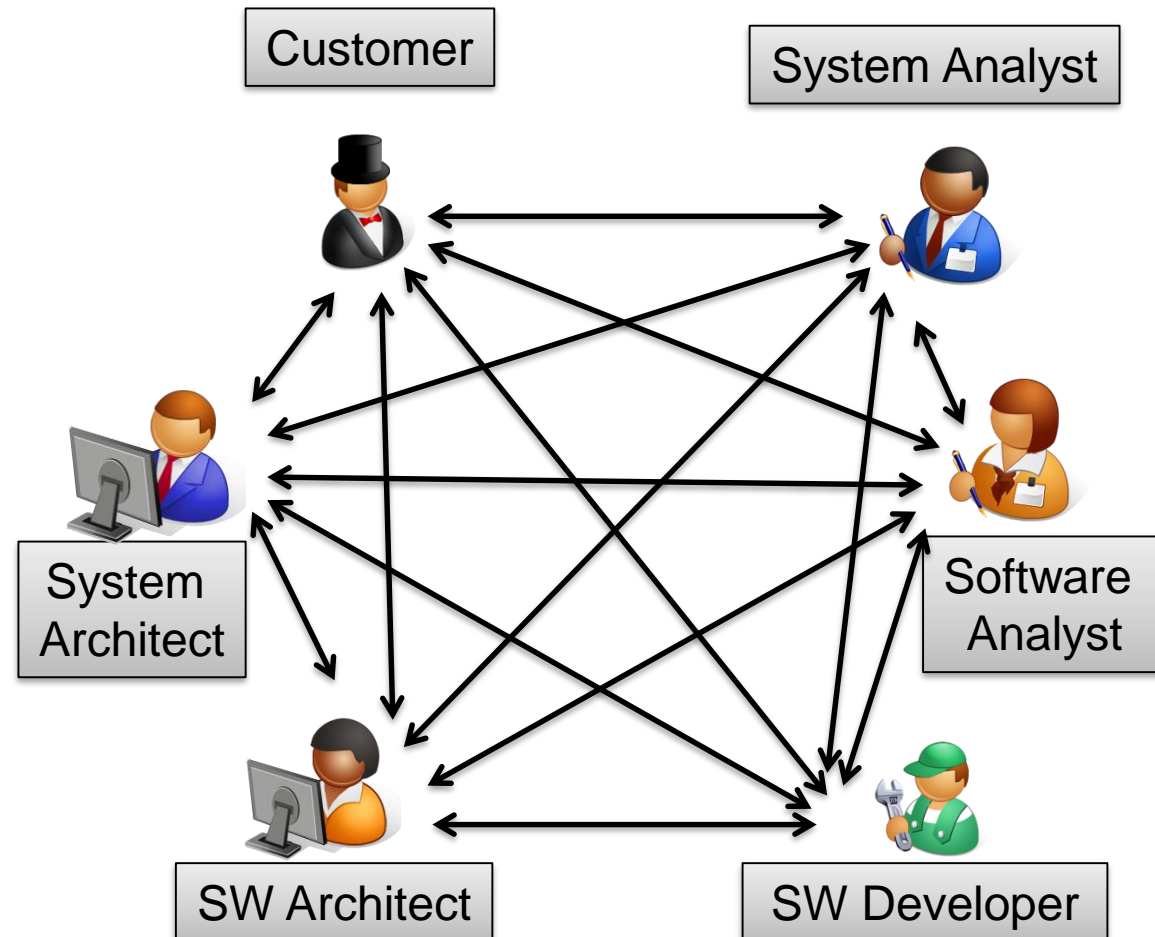
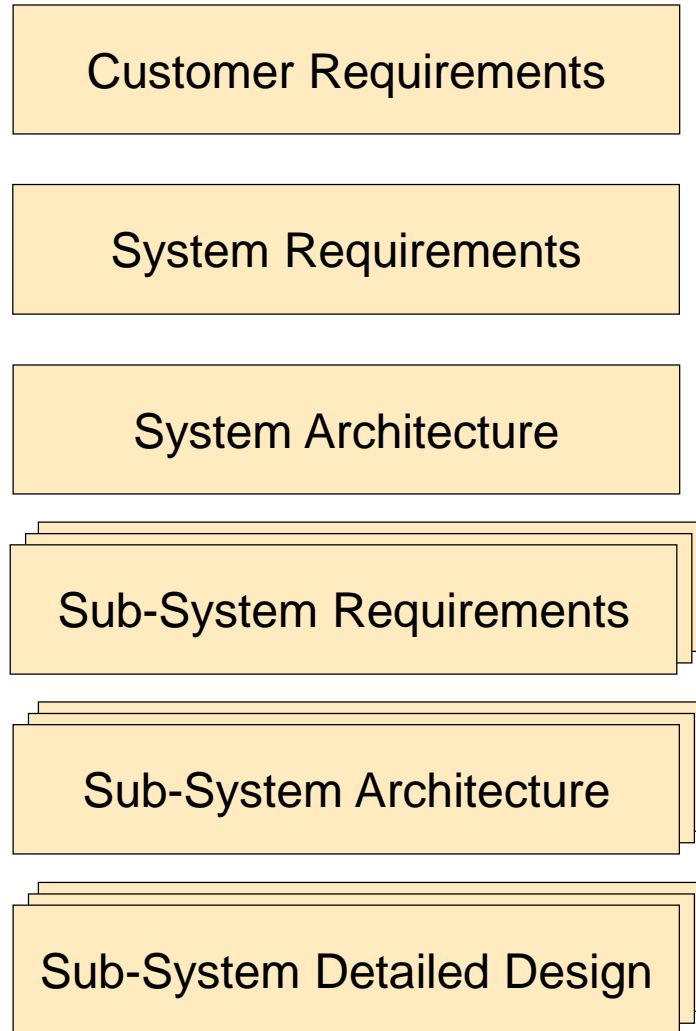


Possible Team Communication



Collaboration is supported by the V-model

Possible Team Communication



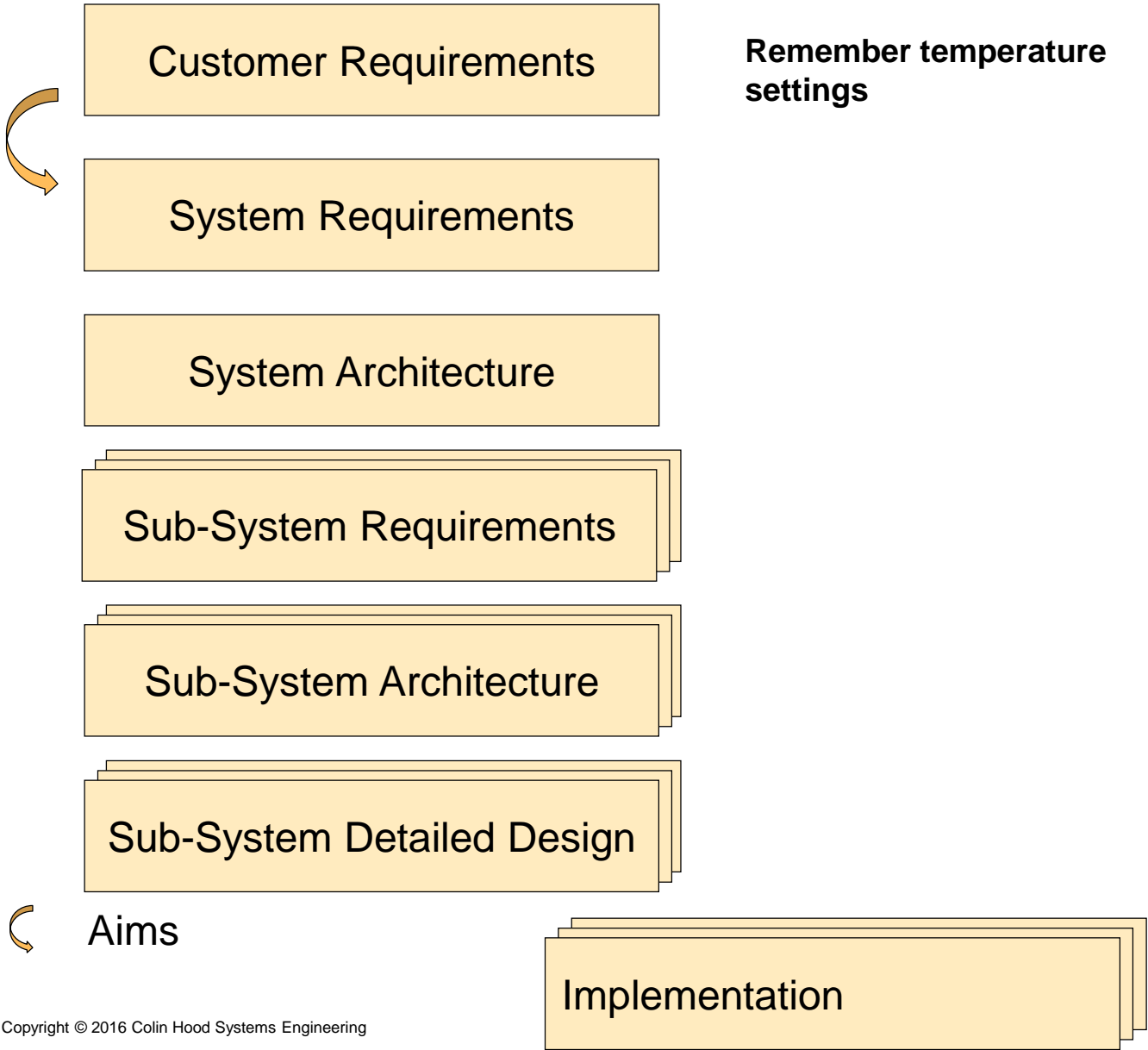
Collaboration is supported by the V-model

- The following slides show how the team might work together to consider how best to design the best solution.
- The scenario shows that all processes are concurrent and affect each other.
- The scenario shows that the processes do not have a strict sequential dependency

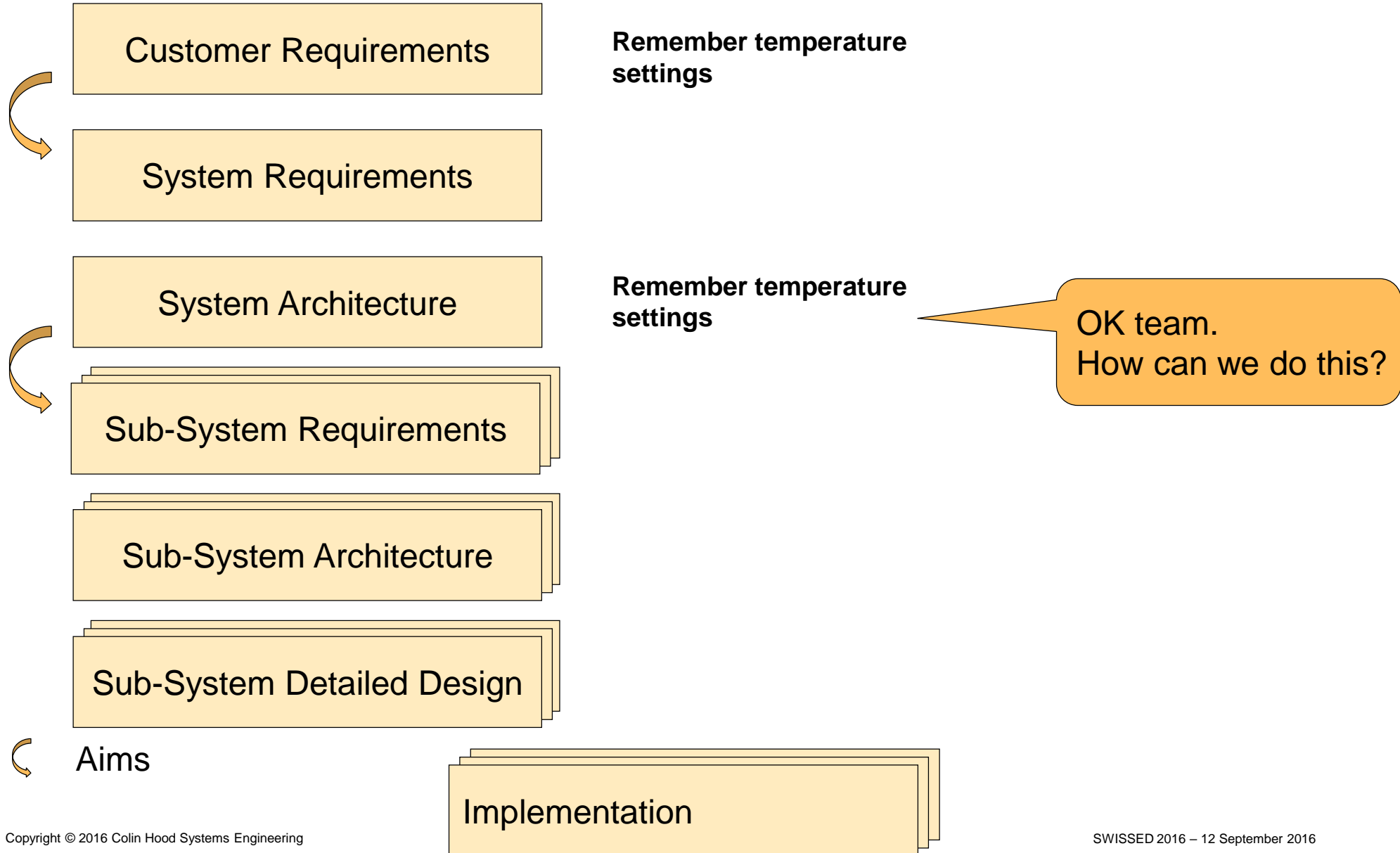
Note:

- Some people may perform more than one role
- Some roles may be performed by more than one person

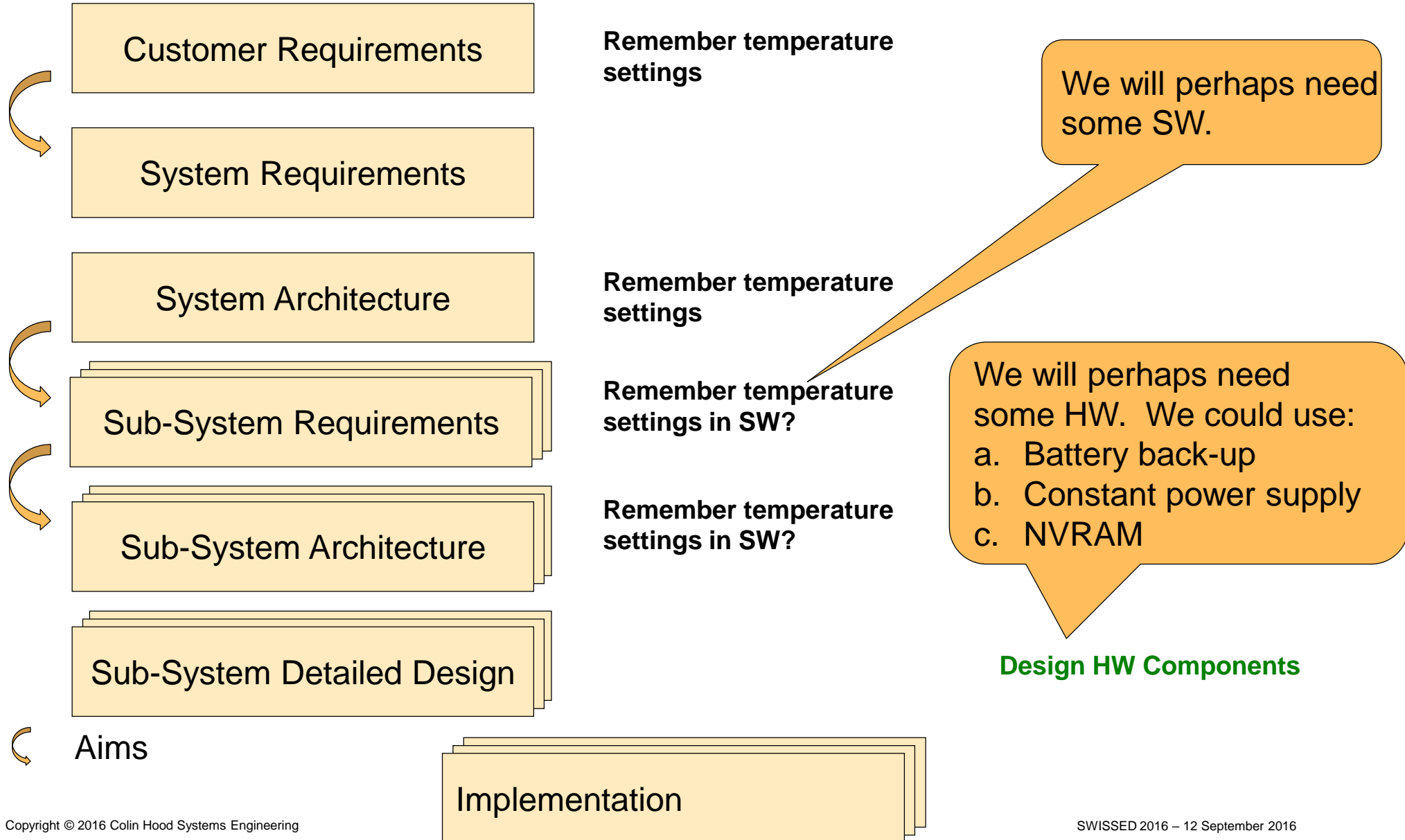
A Simple Example



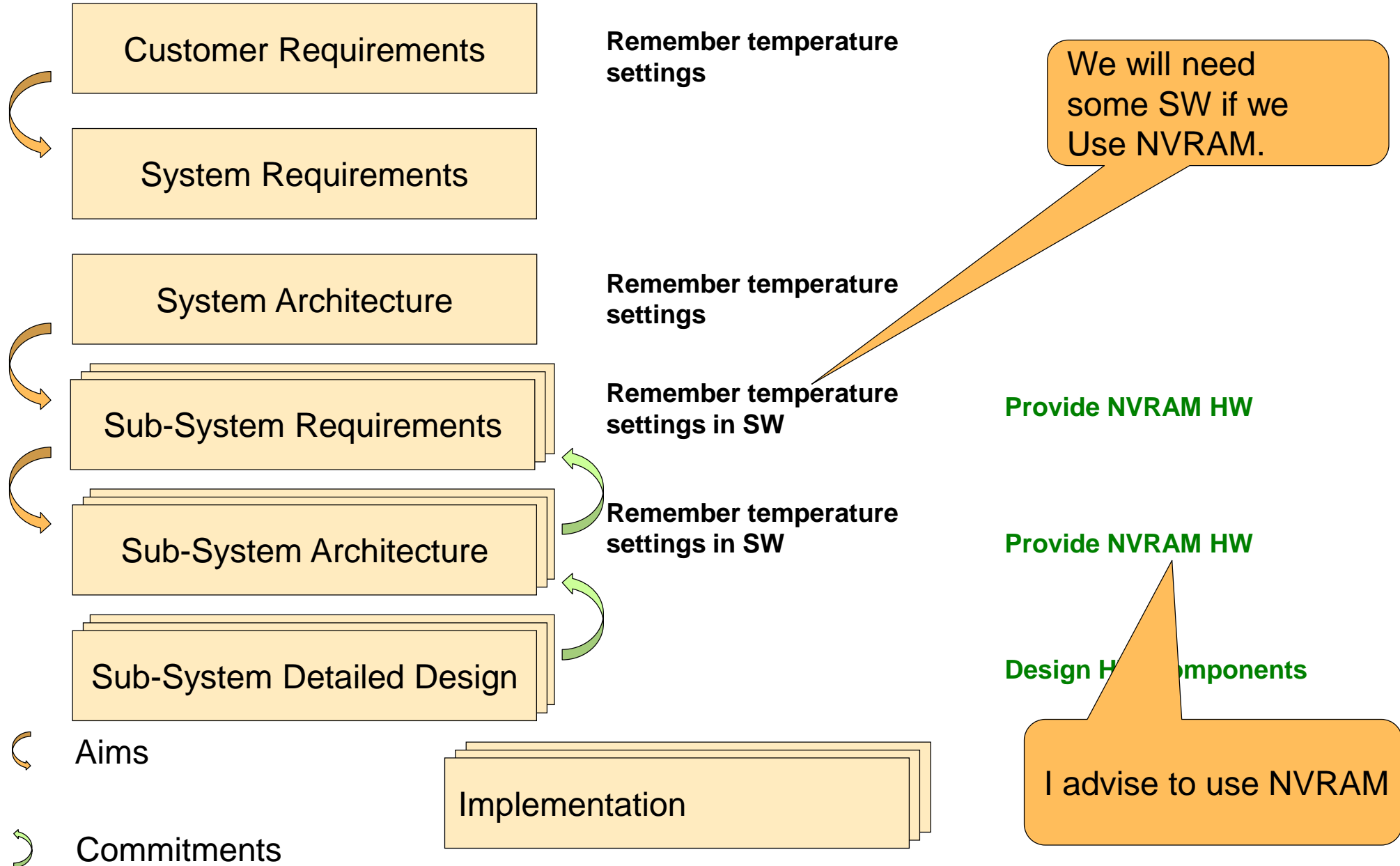
A Simple Example



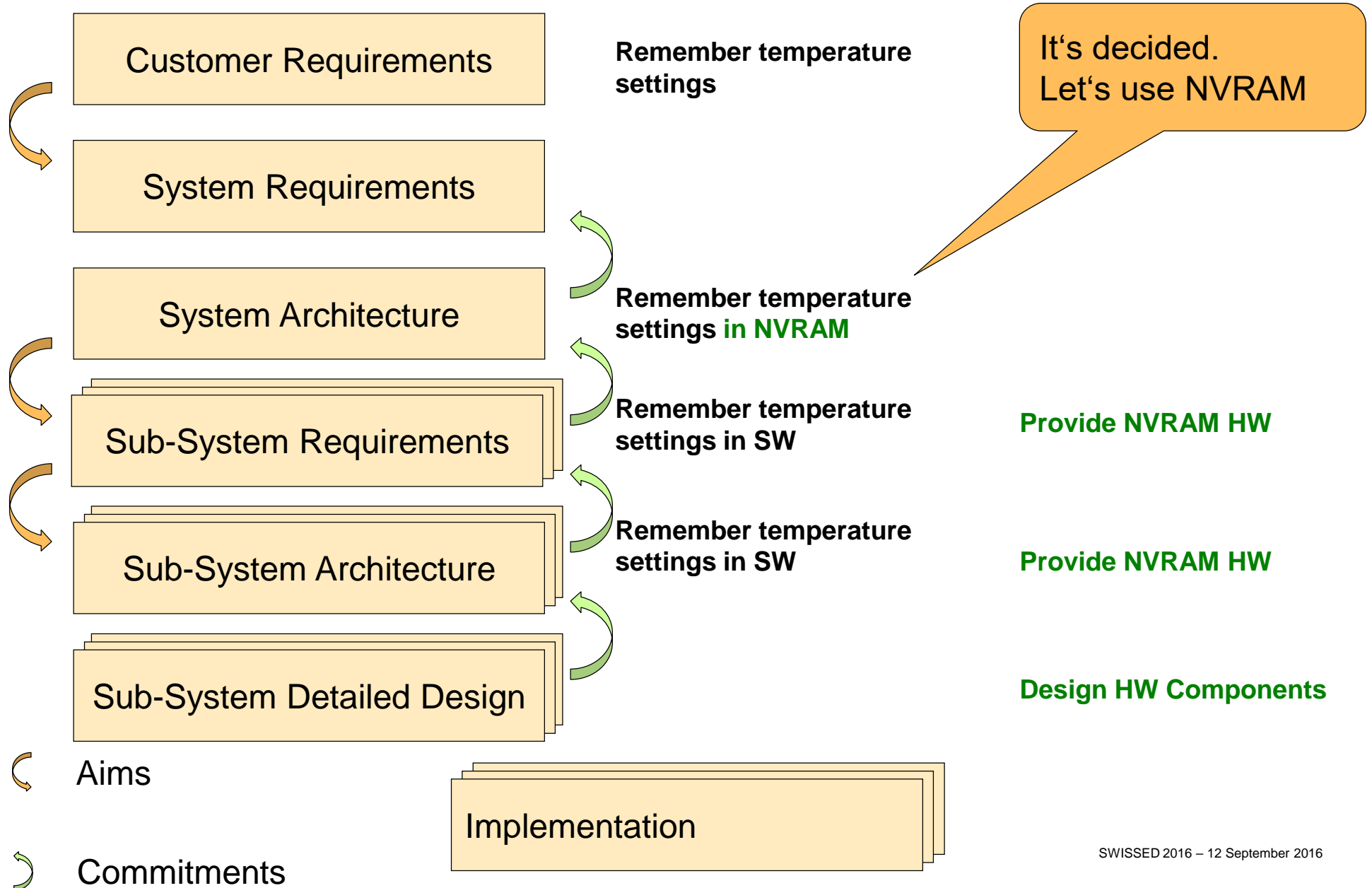
A Simple Example



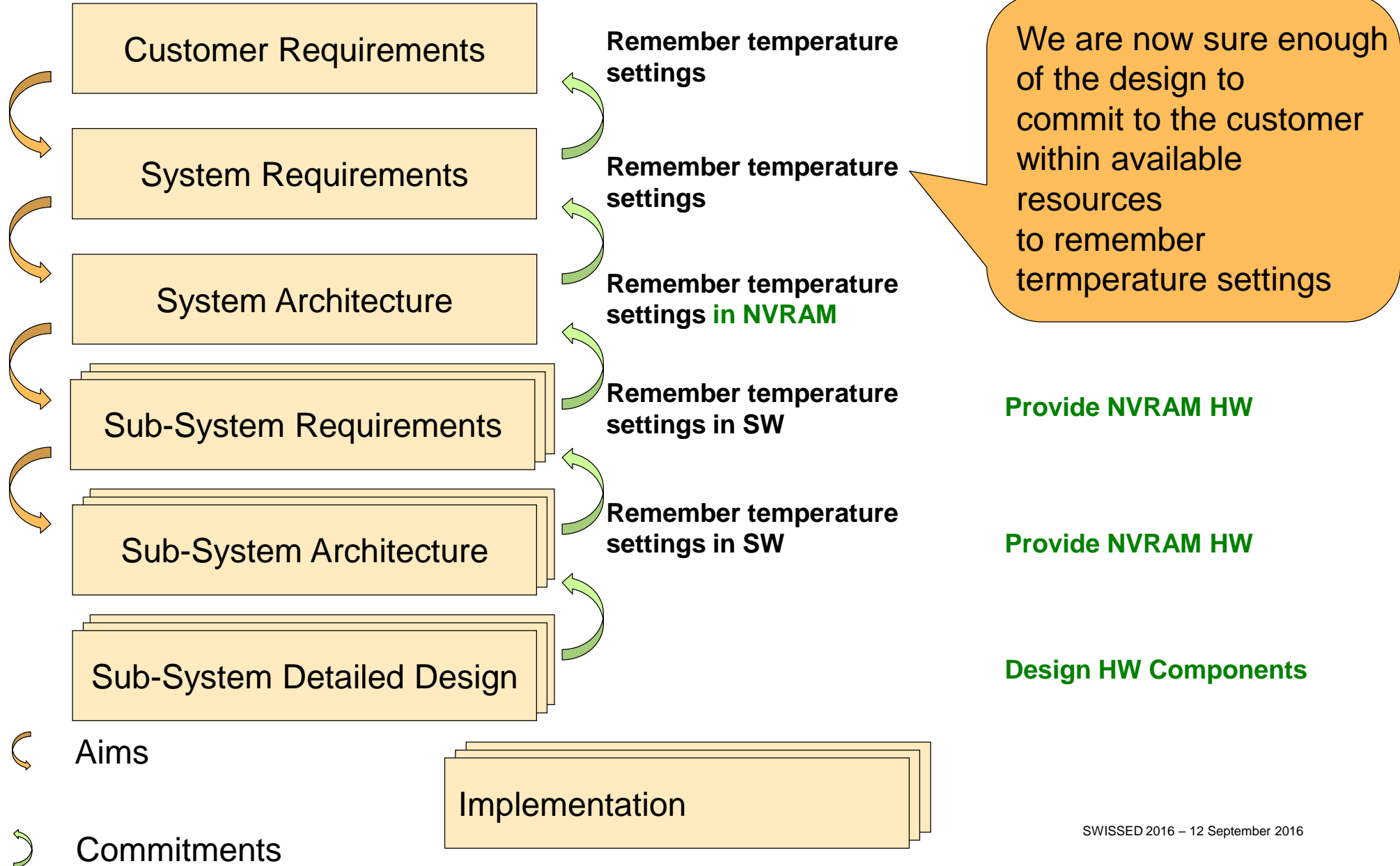
A Simple Example



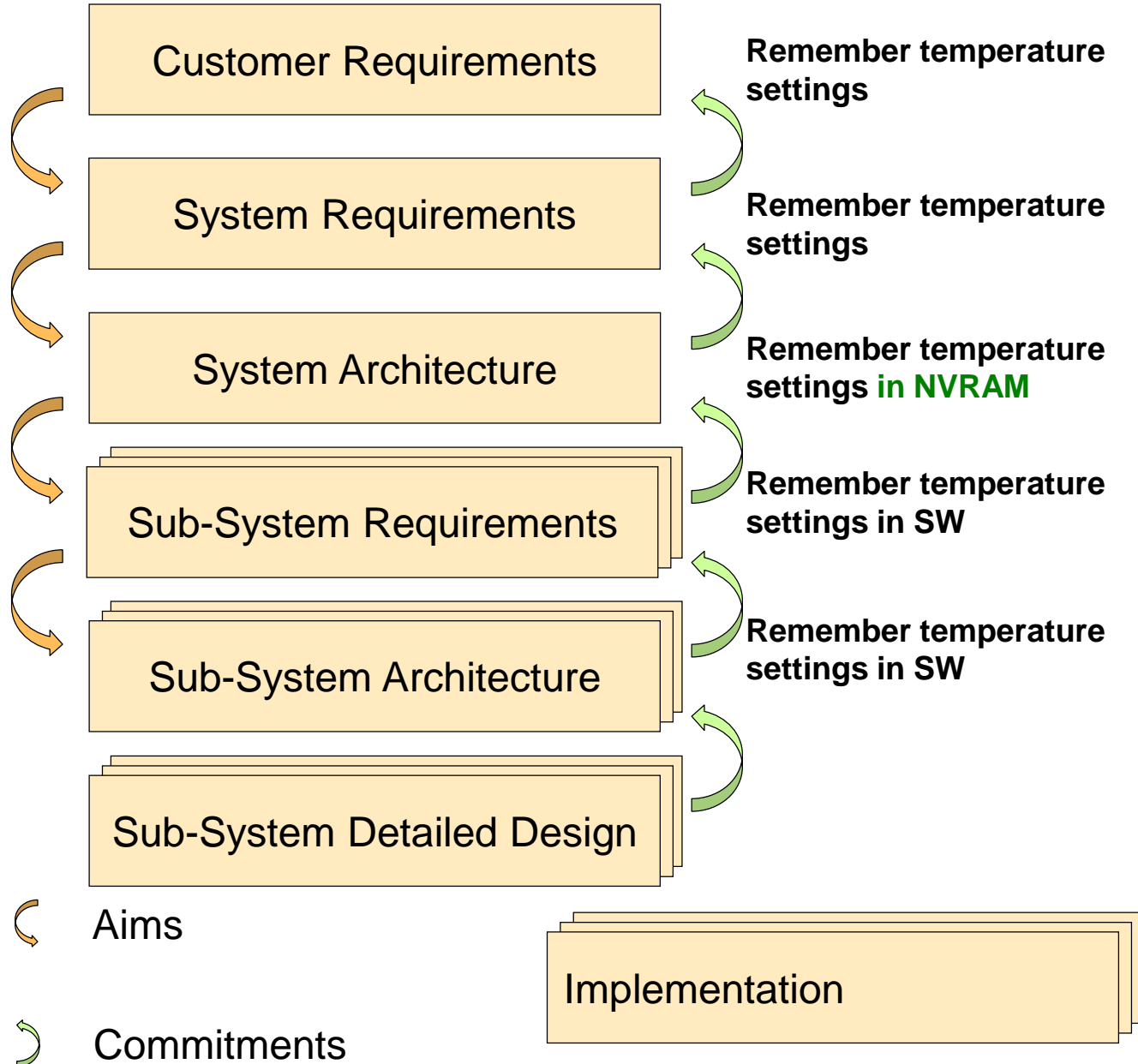
A Simple Example



A Simple Example



A Simple Example



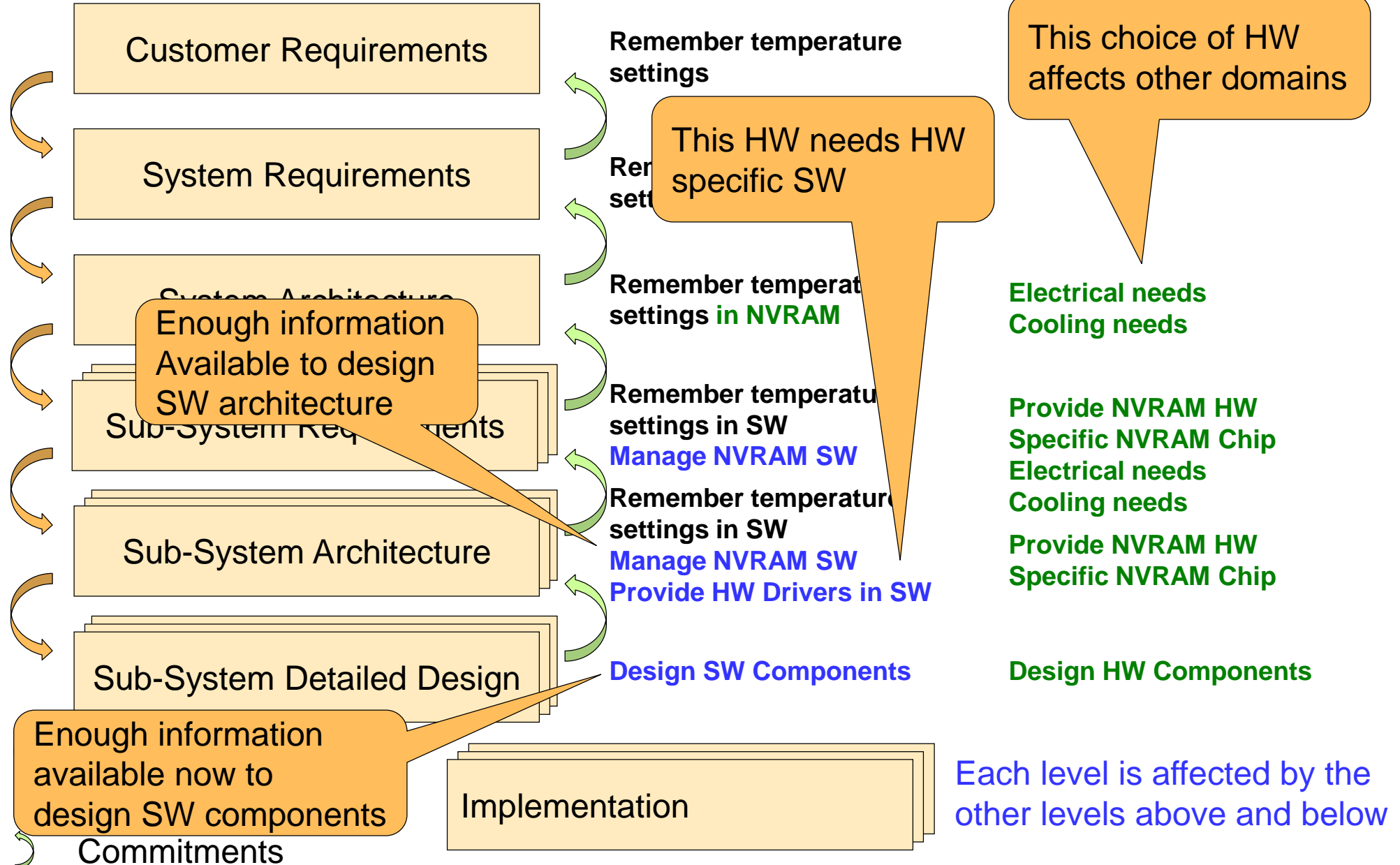
NVRAM chip is selected

Provide NVRAM HW Specific NVRAM Chip

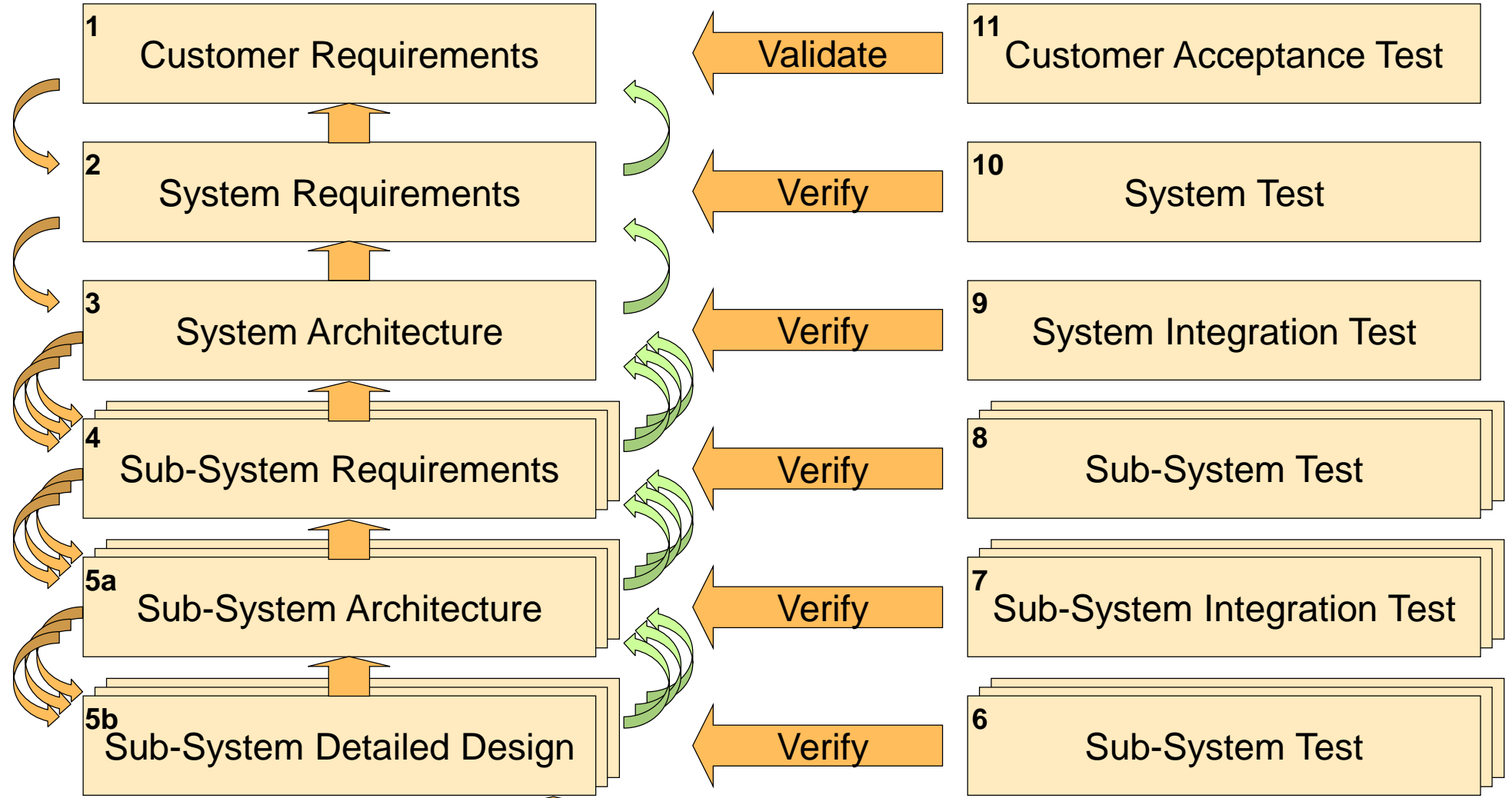
Provide NVRAM HW Specific NVRAM Chip

Design HW Components

A Simple Example



A Simple Information Model



 Aims
 Satisfies
 Commitments

The V model represents ownership of and relationships between information.

Each level identifier represents 3 pieces of information

No sequence is implied

Level identifier	The role defines responsibility and level of skills needed for this level	The process defines tasks to be done or aims to be achieved for this level	The definition of work-product defines how something is to be constructed and where it is to be stored for this level
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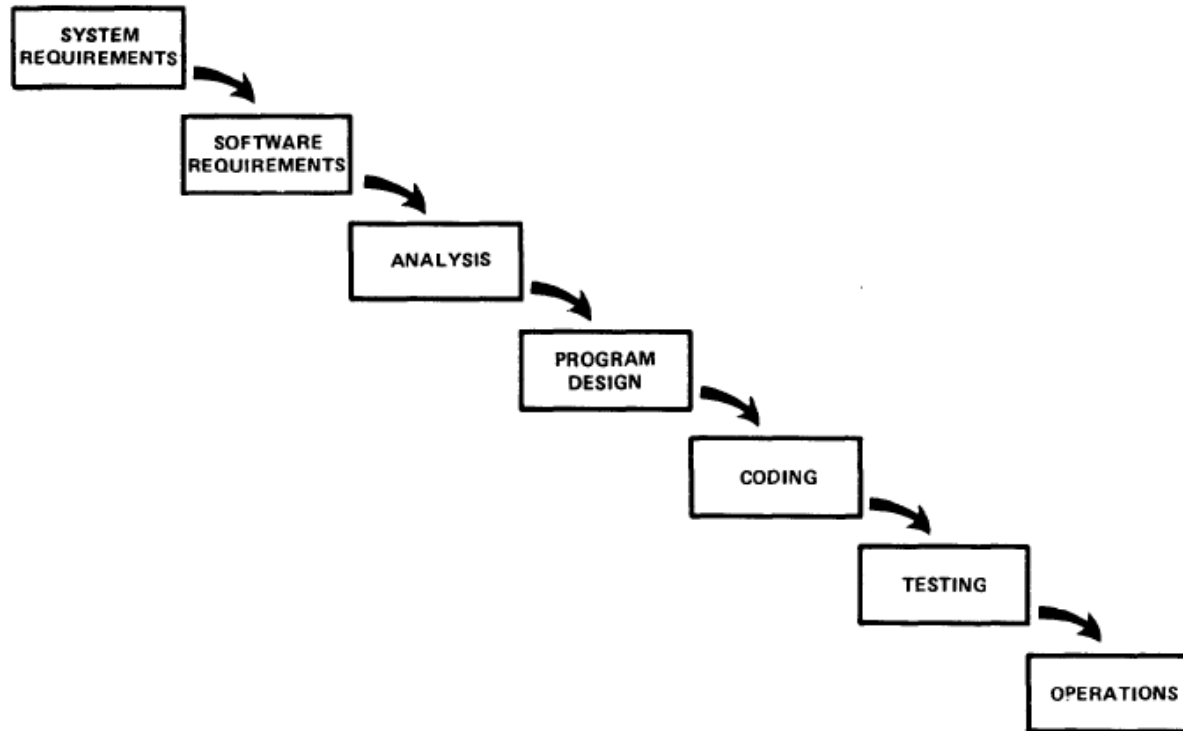
Each level identifier represents 3 pieces of information

The V model represents graphically; ownership of and relationships between information.

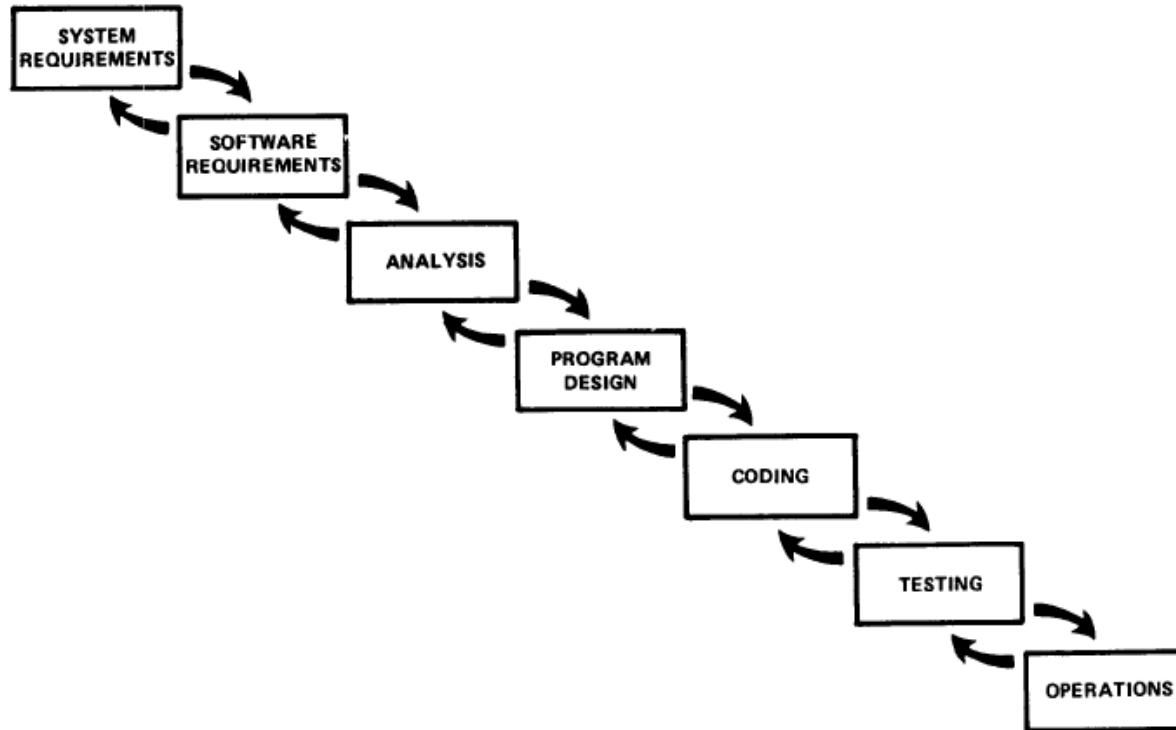
Level identifier	The role defines responsibility and level of skills needed for this level	The process defines tasks to be done or aims to be achieved for this level	The definition of work-product defines how something is to be constructed and where it is to be stored for this level
3	System Architect	Create and verify System Architecture	To specify: <ul style="list-style-type: none">i. Structure of decomposition of system into partsii. Requirements allocated to system partsiii. Interfacesiv. How the parts interact

The First Waterfall Model (Royce 1970)

Warning: This can only work on very small projects (Royce)

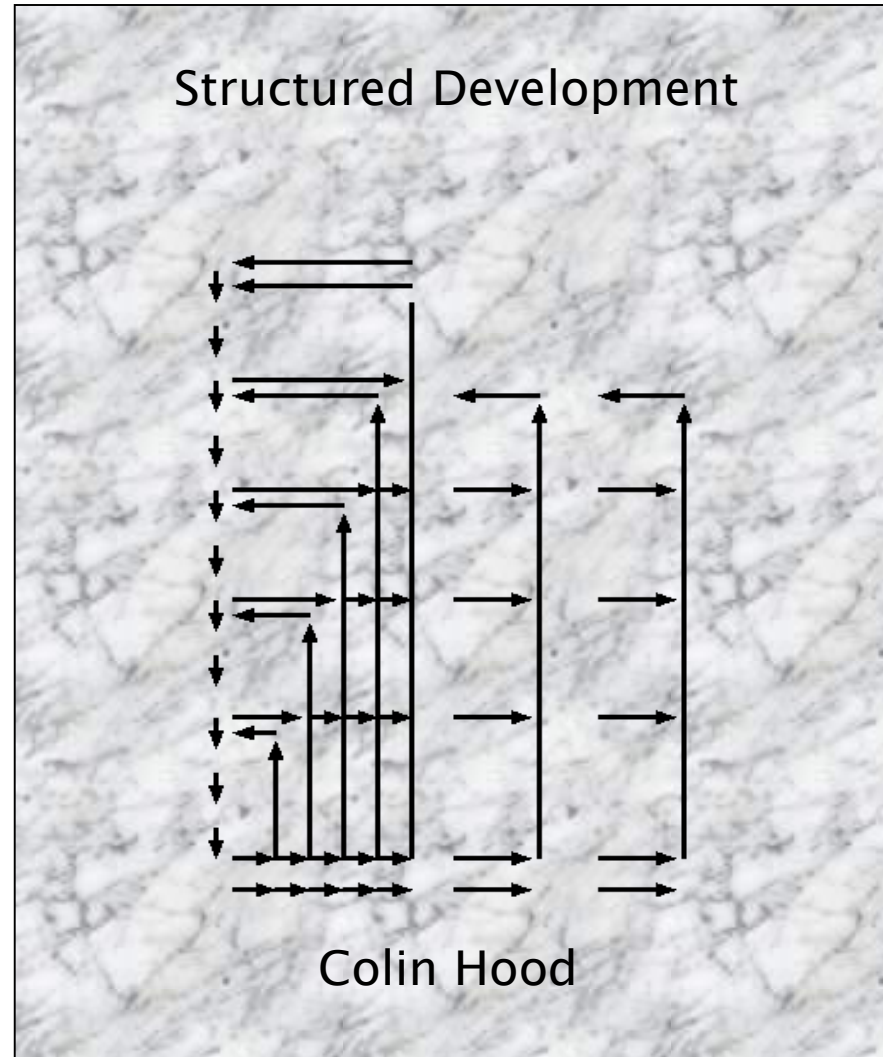


Warning: Iterations and increments are necessary (Royce)



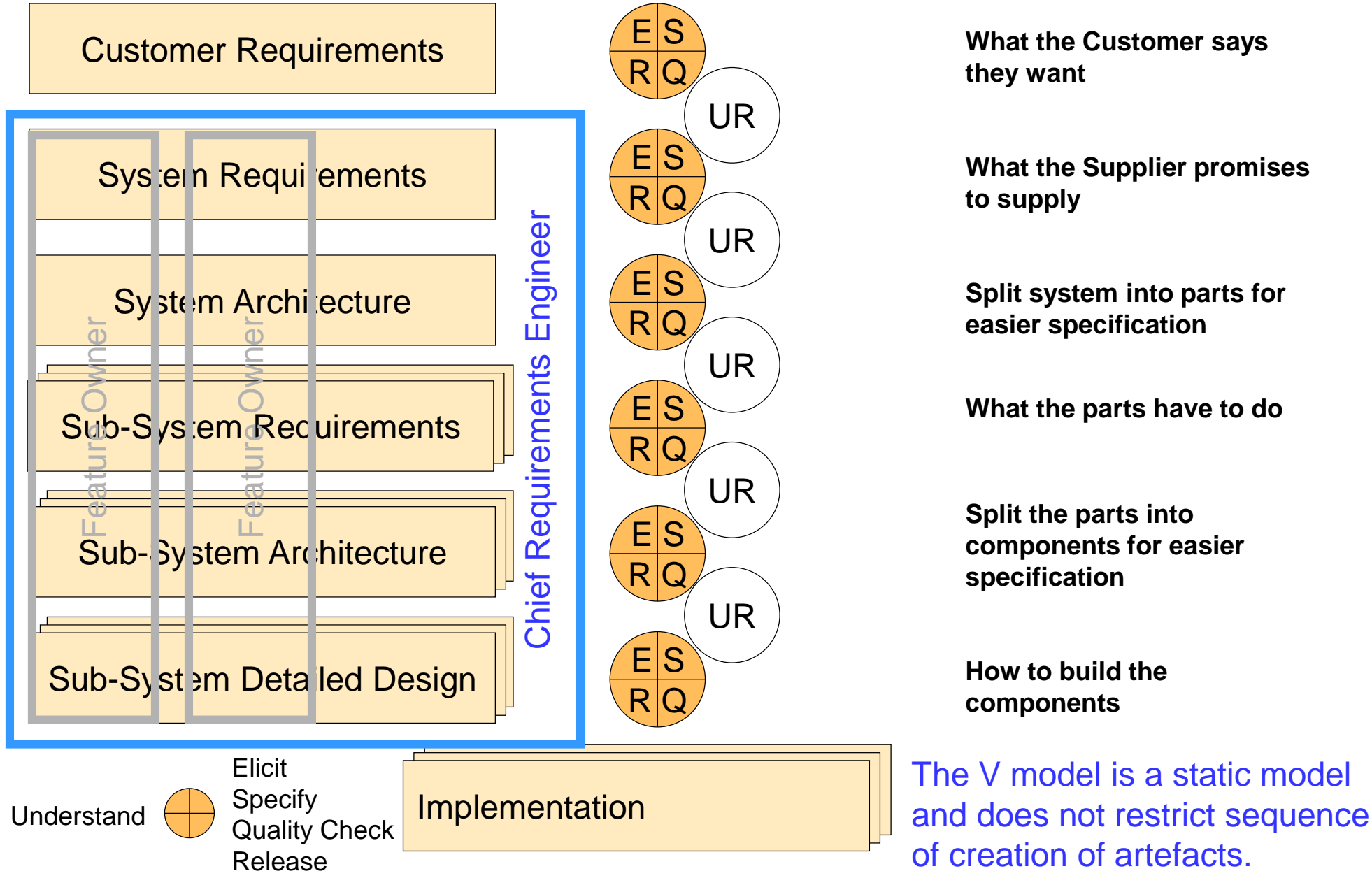
The V-Model was invented twice
in the late 1980's by NASA and
by Kevin Forsberg and Hal Mooz 1991

Source: Forsberg and Mooz

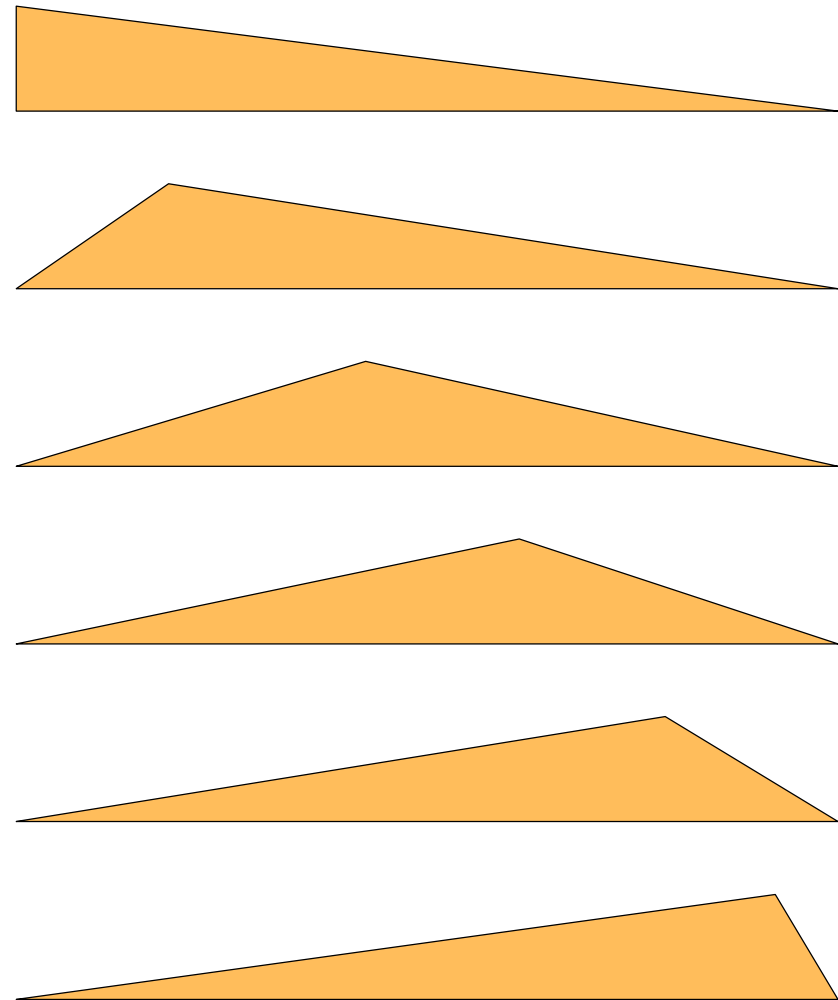
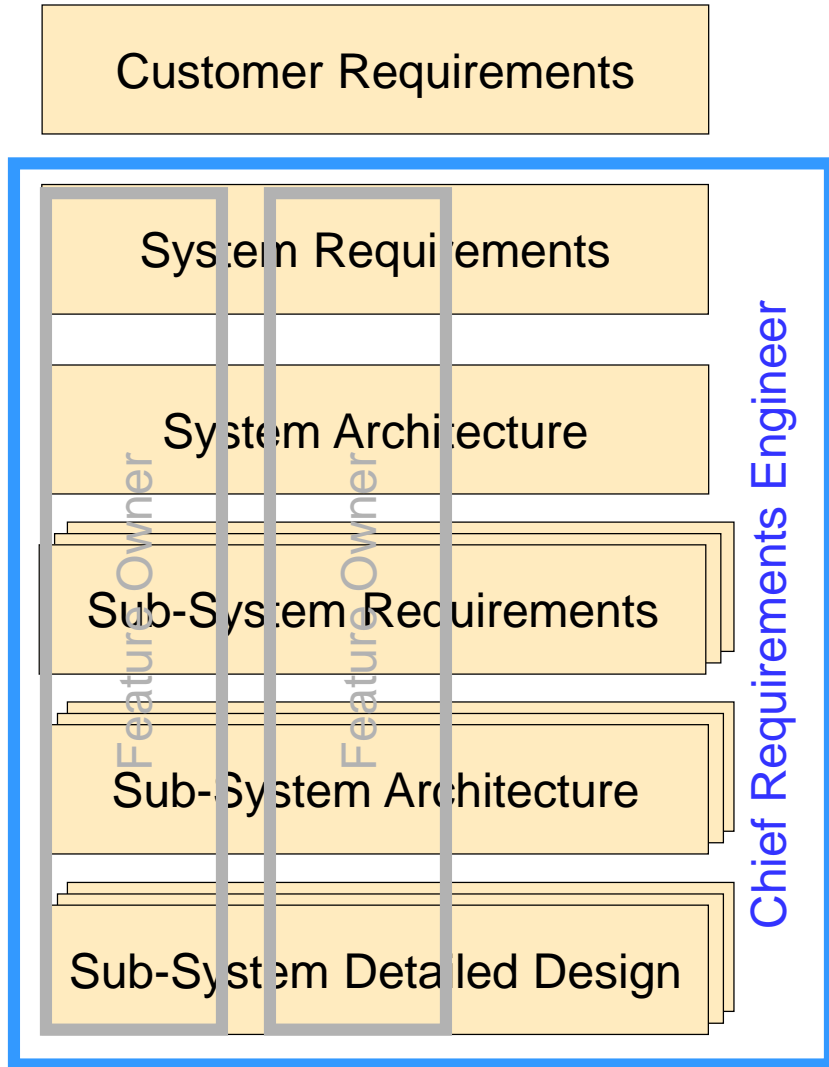


A V-Model was
created by
Colin Hood in
1986 based on
work by Royce

All levels may be worked upon at the same time

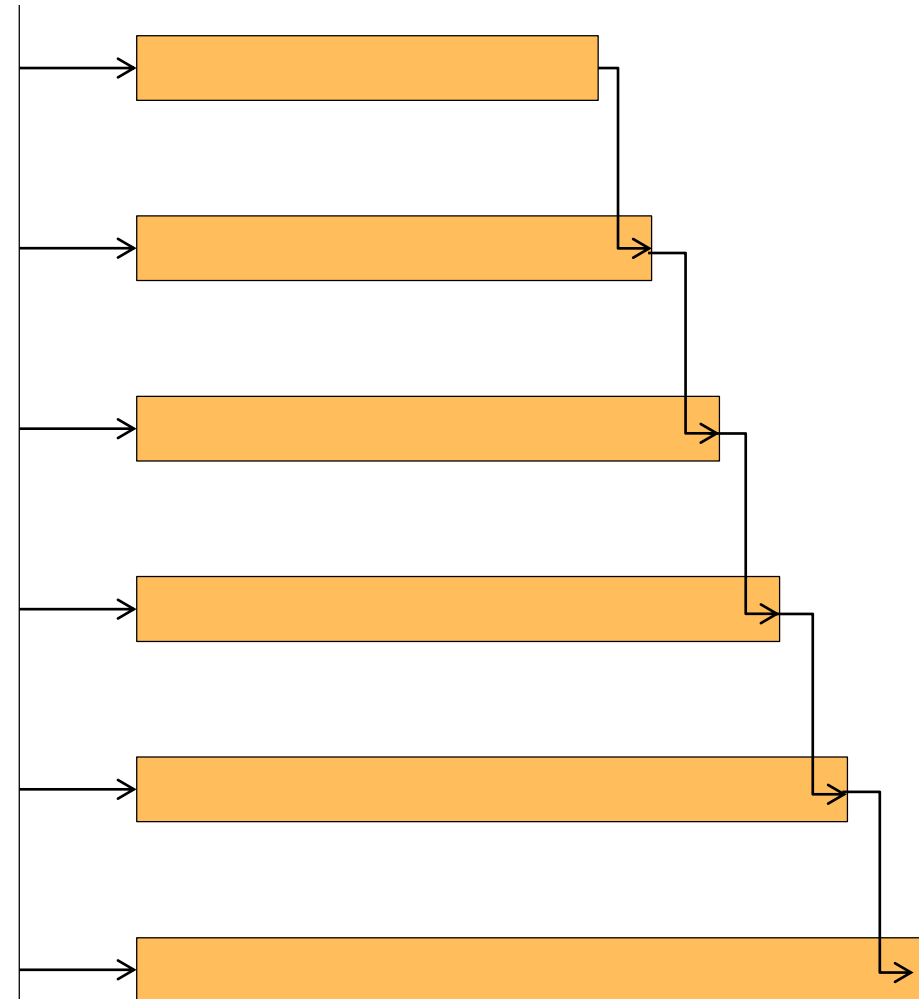
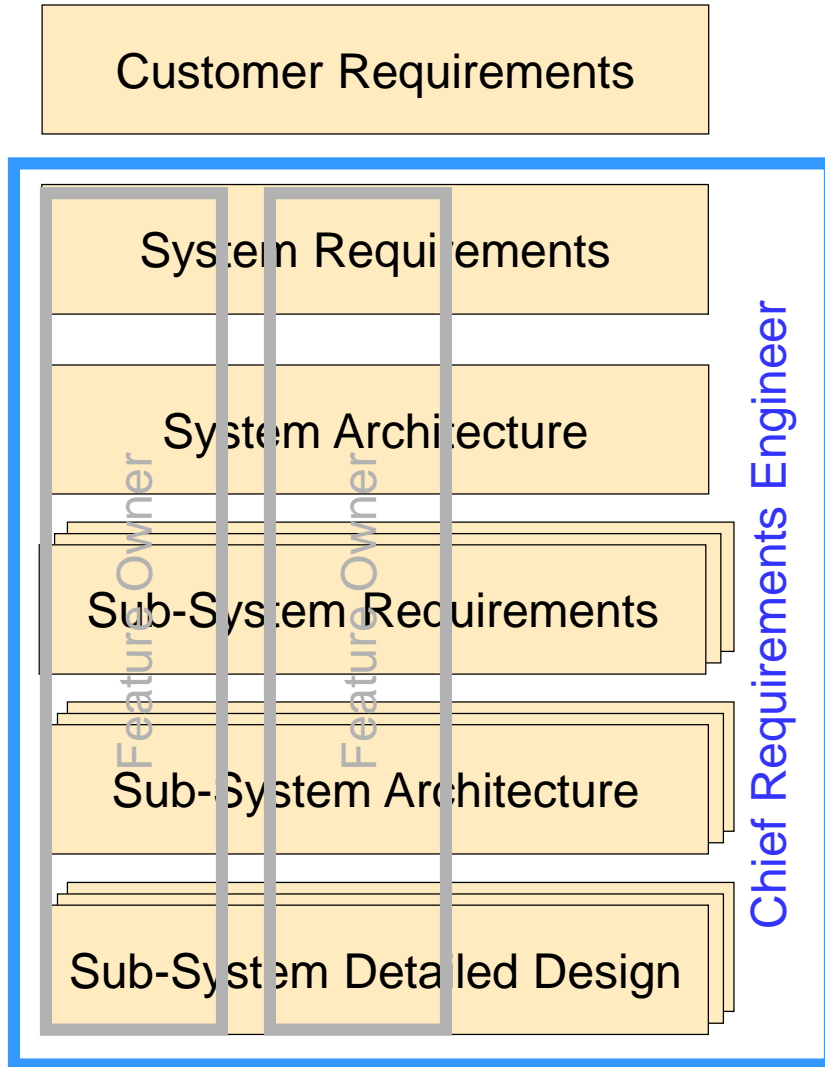


All levels may be worked upon at the same time



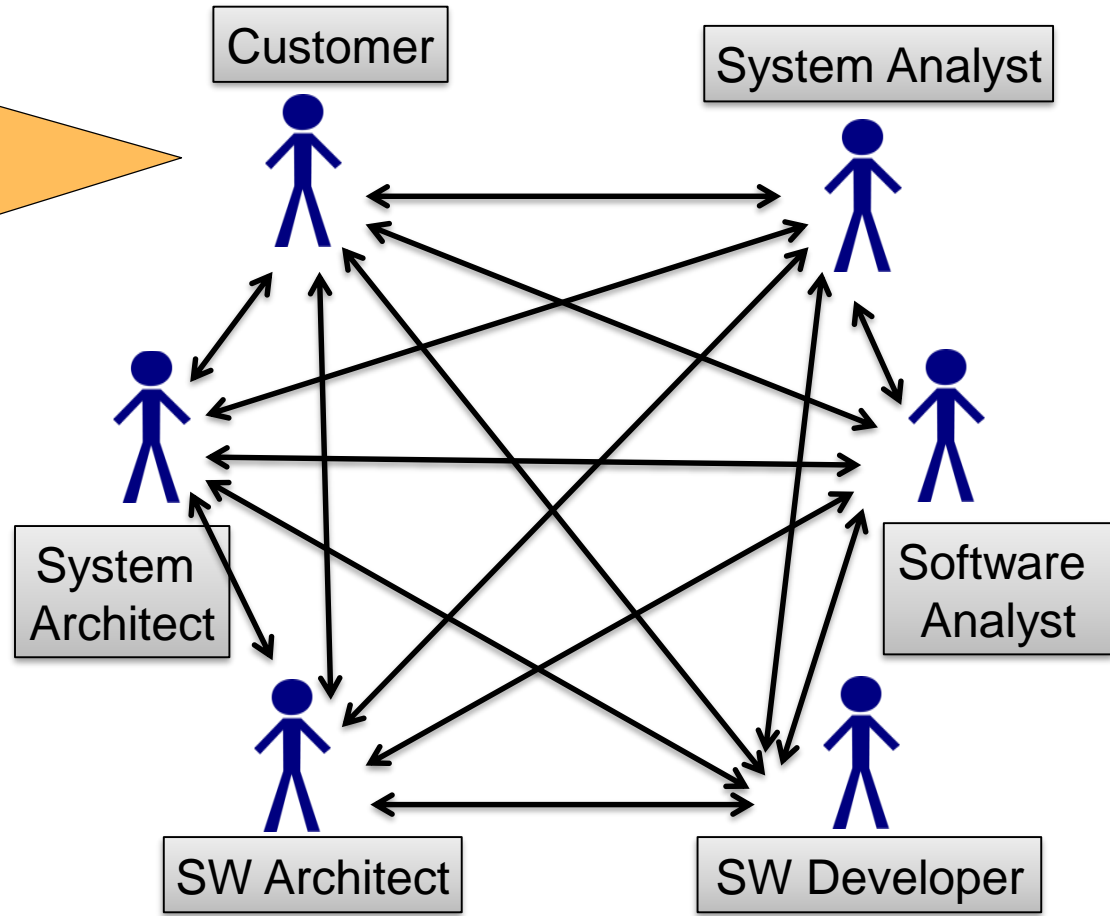
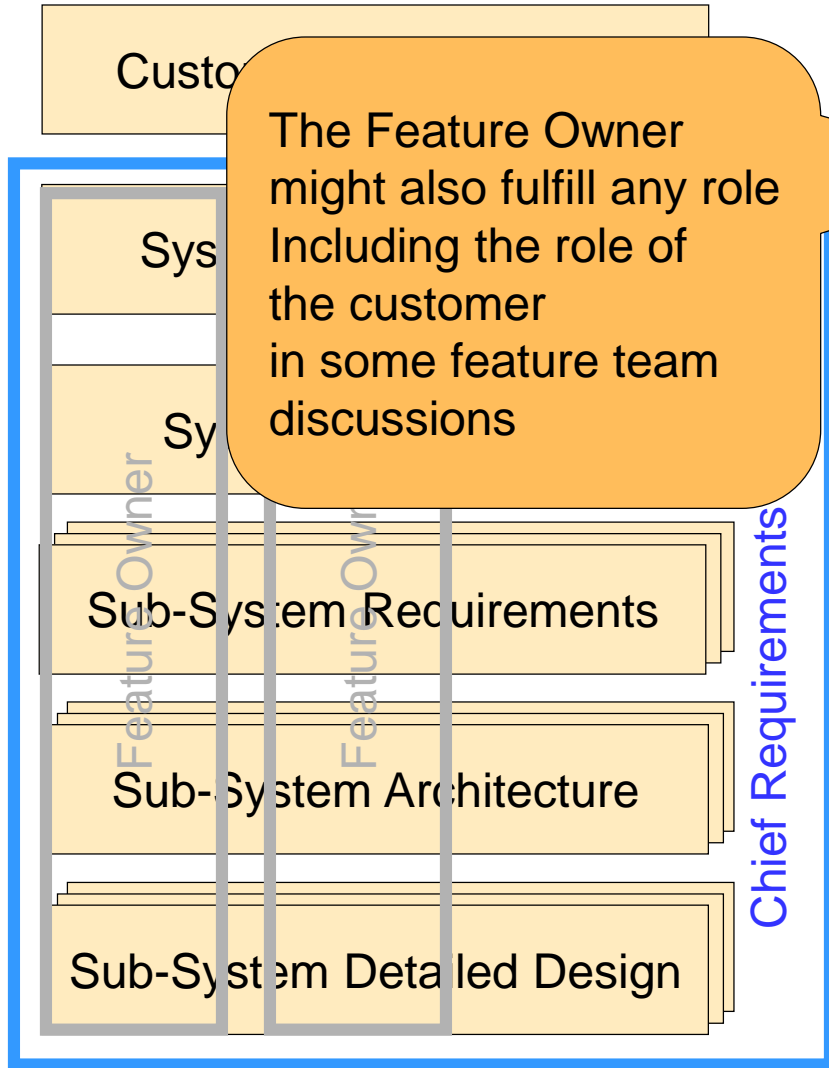
Per release the emphasis of effort changes over time

All levels may be worked upon at the same time



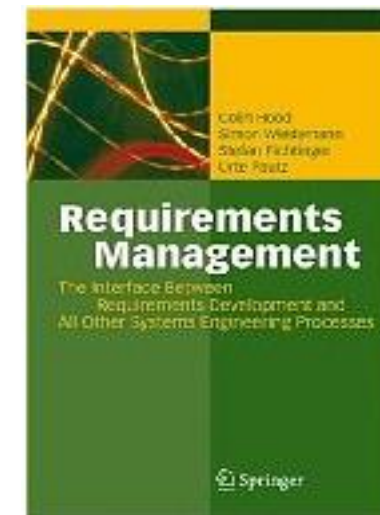
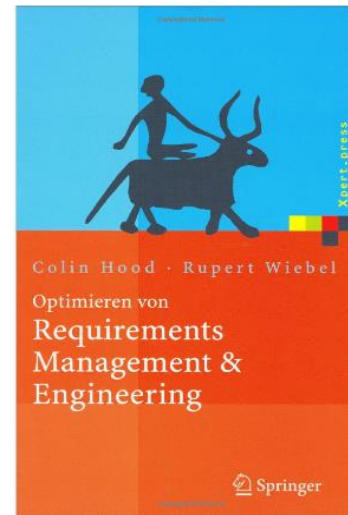
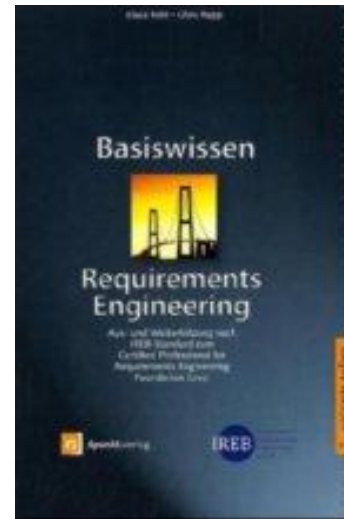
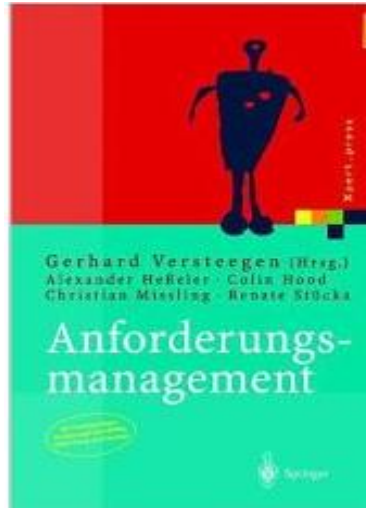
Lower levels may not finish before the next higher level

Feature Owner leads Team Communication



Collaborative incremental feature based development is supported by the V-model

- The V model represents graphically; ownership of and relationships between information.
- The V model is a static model and does not restrict sequence of creation of artefacts.
- The V model is state-of-the-art.



Founding Board Member of IREB 2006
(International Requirements Engineering Board)

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INCOSE Member since 1999