The Significance of Configuration Management (CM) in the Context of Systems Engineering (SE)

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An overview of the potential role of CM in supporting and enabling SE with an emphasis on Requirements Engineering (RE) activities in the early phases of development programs.

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  - CM and SE Customer Domains
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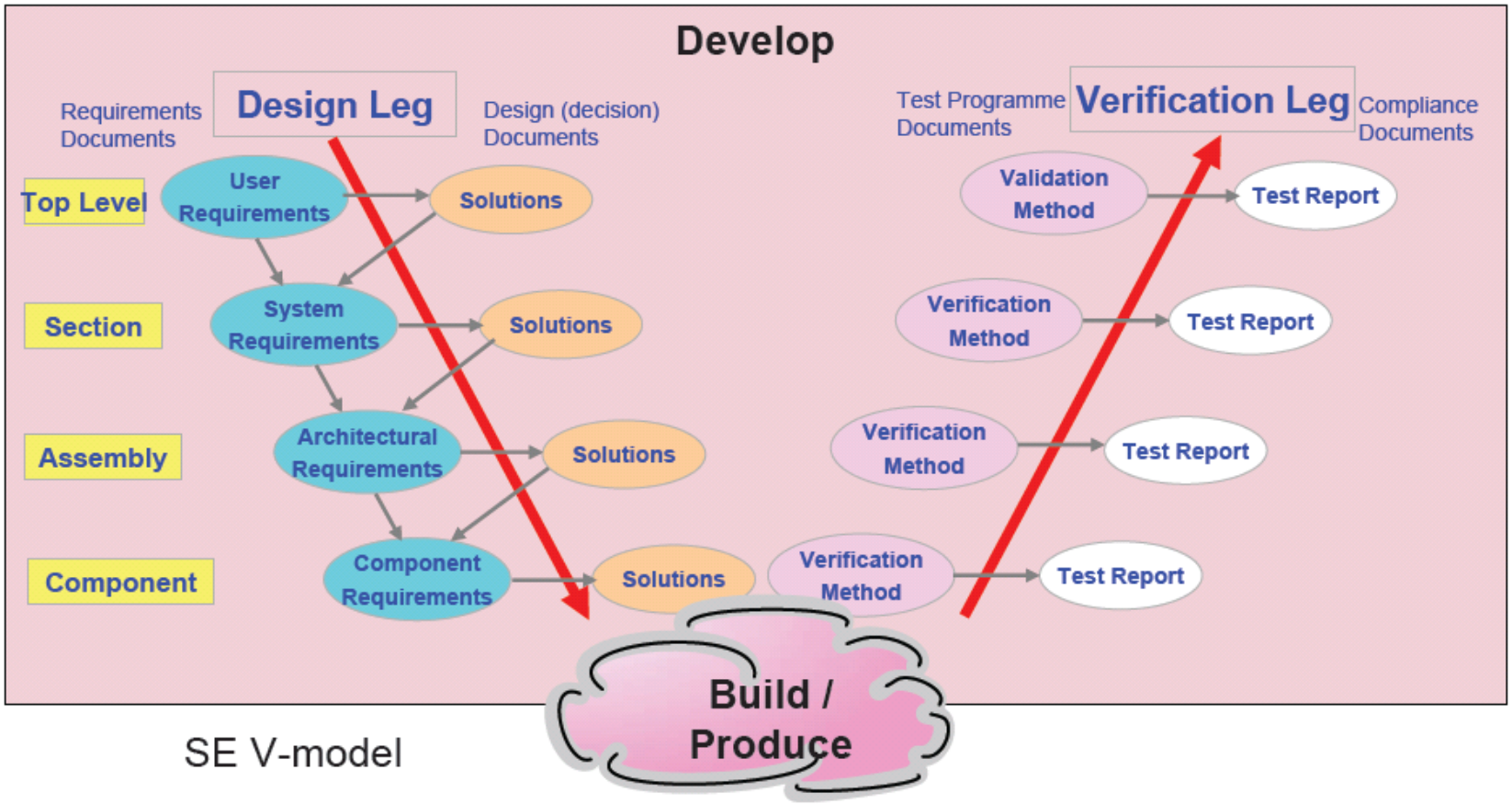
CM and SE Customer

CM customer domains are identical to SE customer domains.

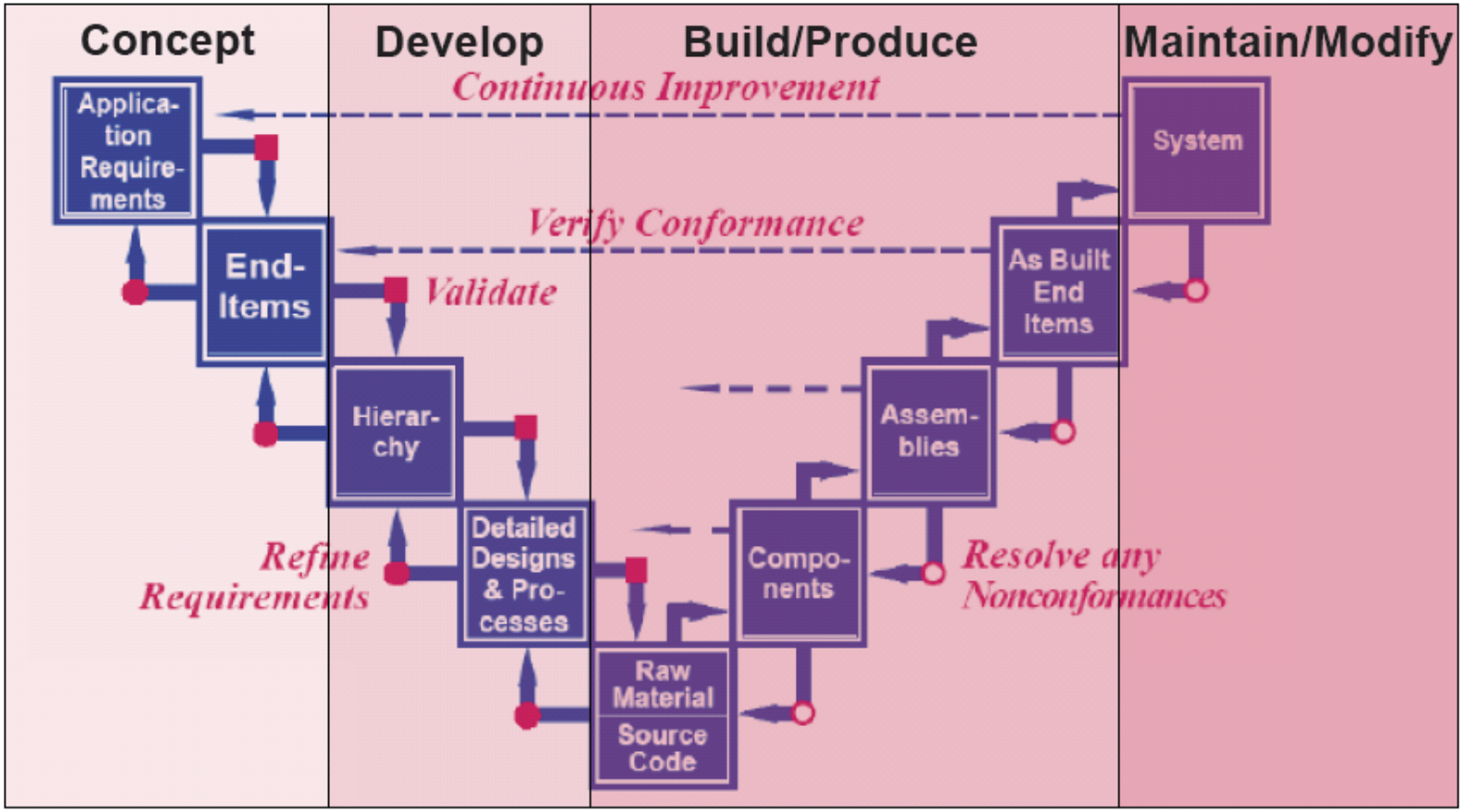
Development process

Development process - example SE model



Development process

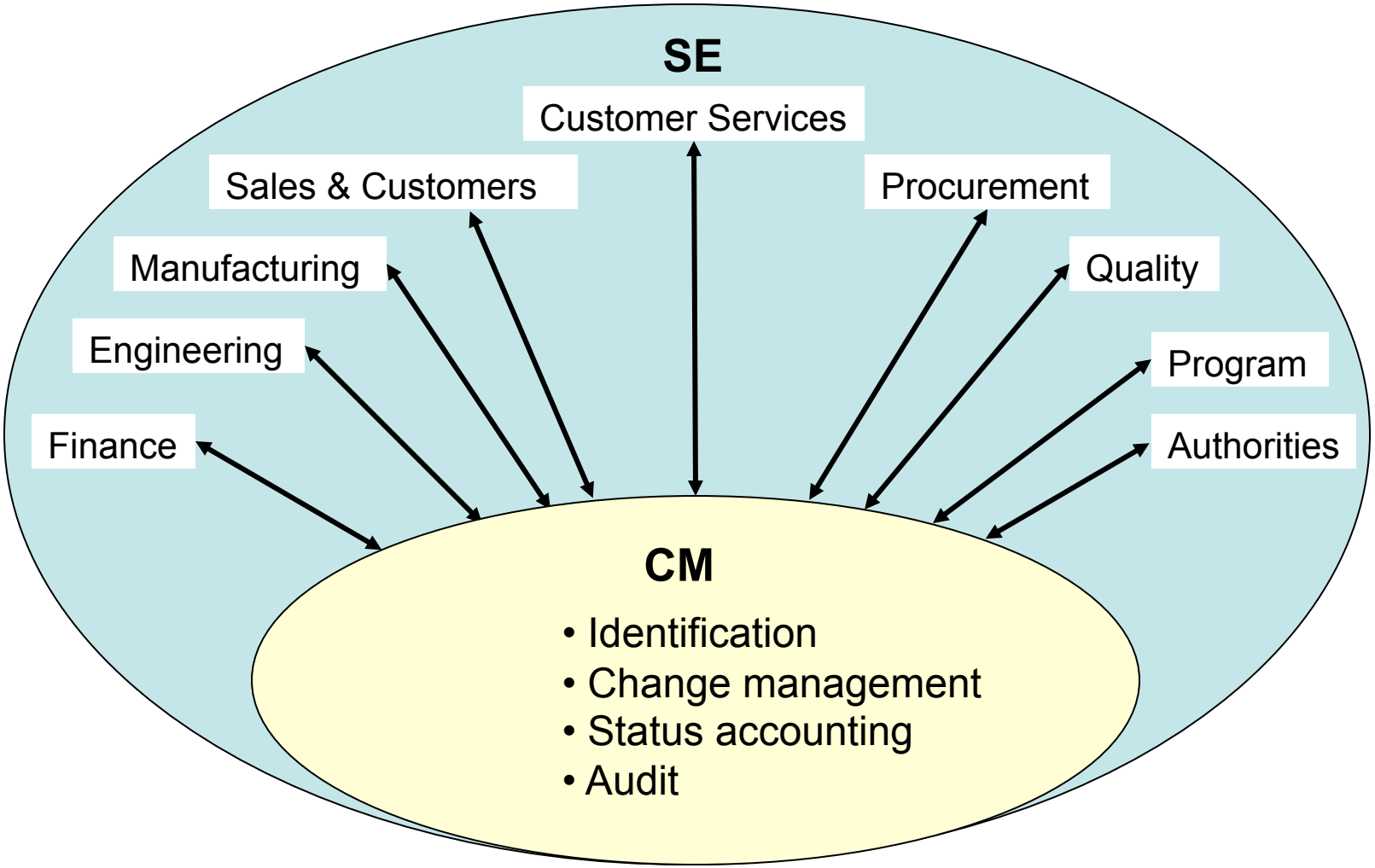
Development process - example CM model



Development V-model

Source: ICM

The four main disciplines of CM



The four main disciplines of CM

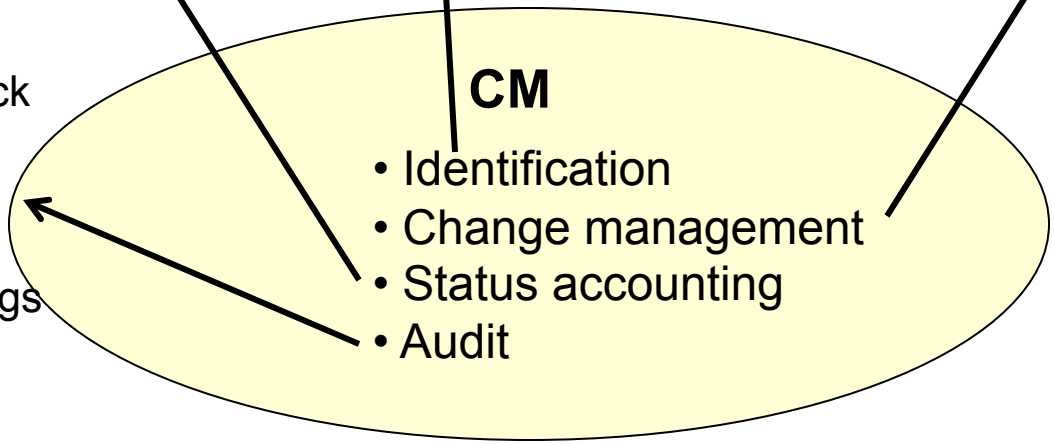
Configuration Identification

- Establish the product breakdown structure Configuration Items (CI) and Design solutions (DS).
- Establish a convention and method for naming and numbering.

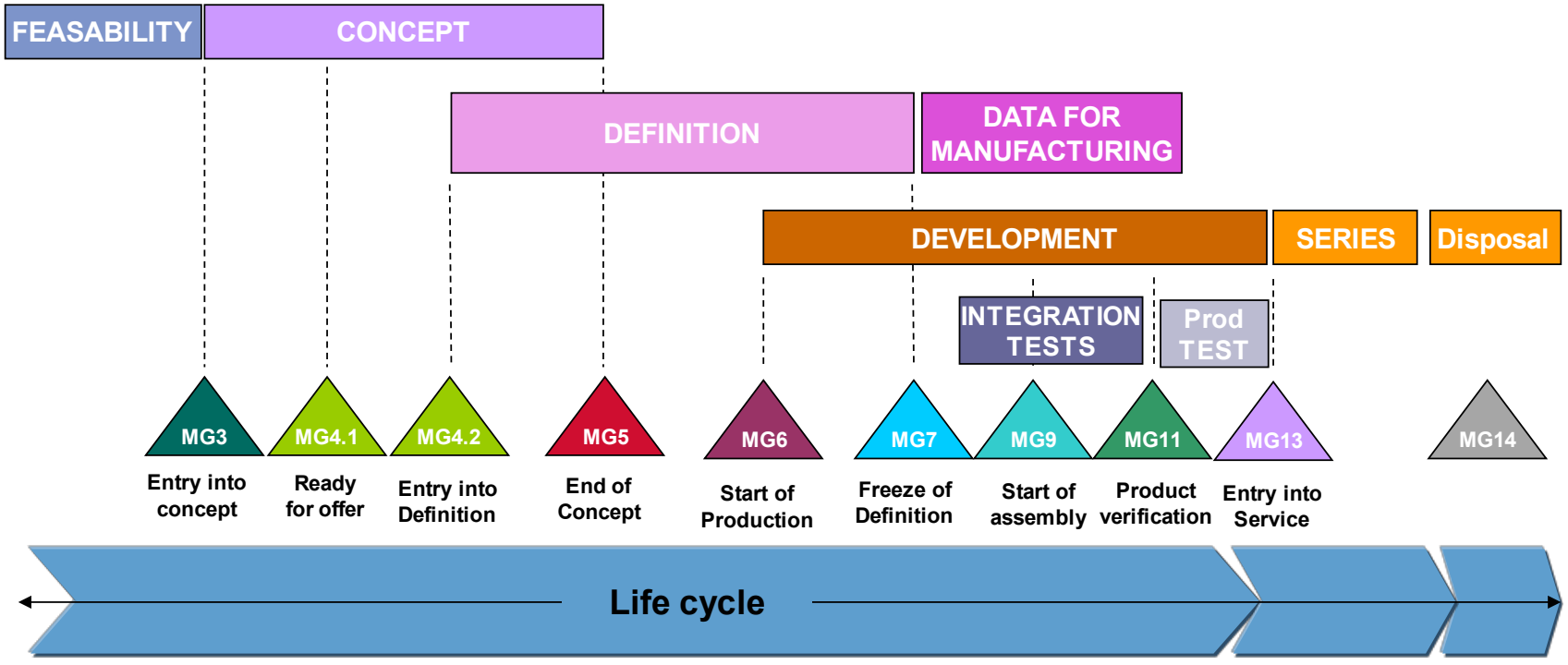
Configuration Status Accounting shall collect, record, process and maintain all data necessary to report the status of established configuration documents thorough the lifecycle. This includes departures from the configuration baselines.

Change Control process.
The change process shall identify the document to be changed and formalized at a configuration control board. Deviations and waivers support the as-built and as-designed configuration state.

Configuration Audit procedures shall check and validate CM process adherence and performance features, report findings and the actions to be taken. A list of audits shall be scheduled

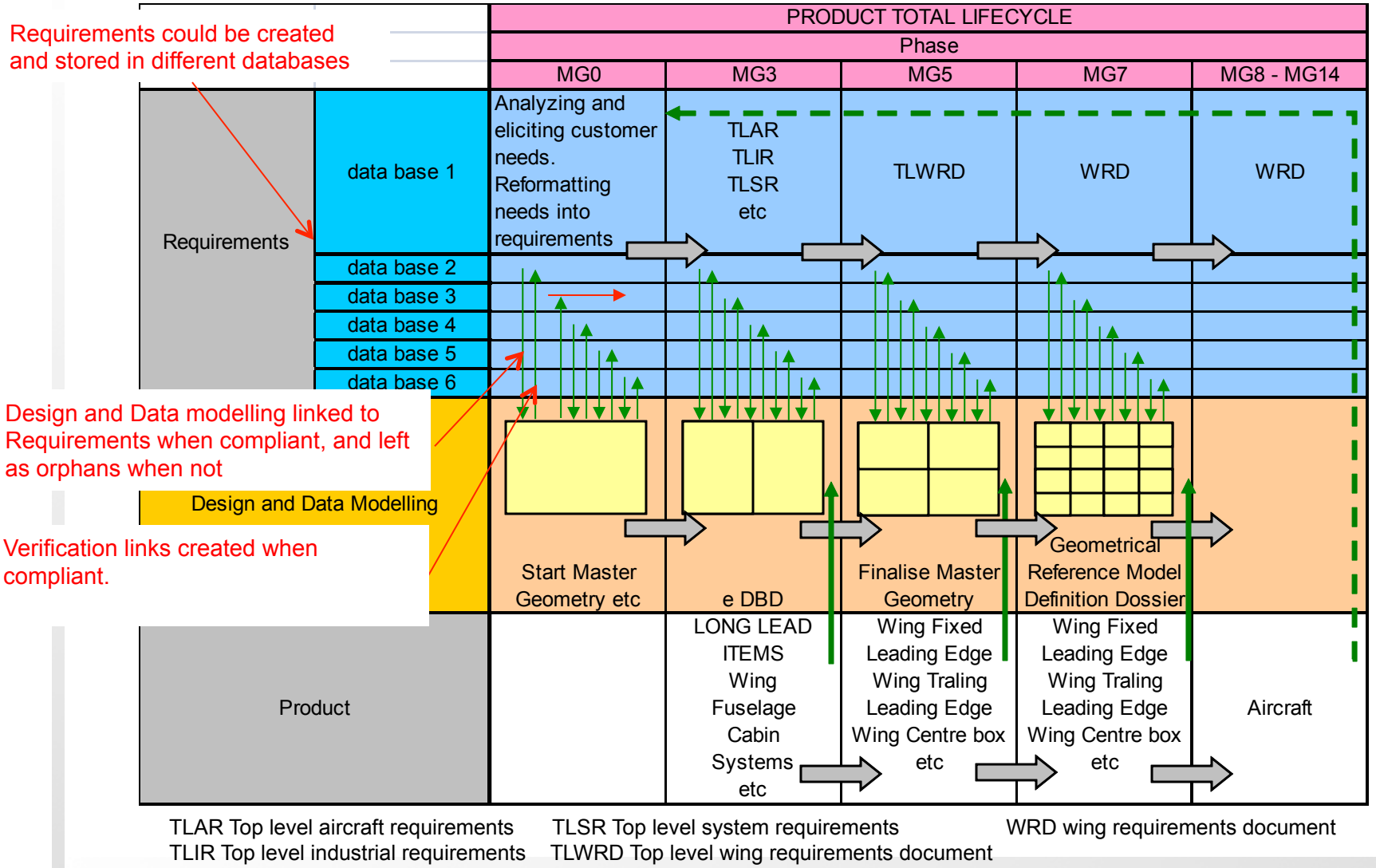


Program Life Cycle



CM processes need to control product and its associated data all along the product lifecycle.

Linking Requirements to Design Data



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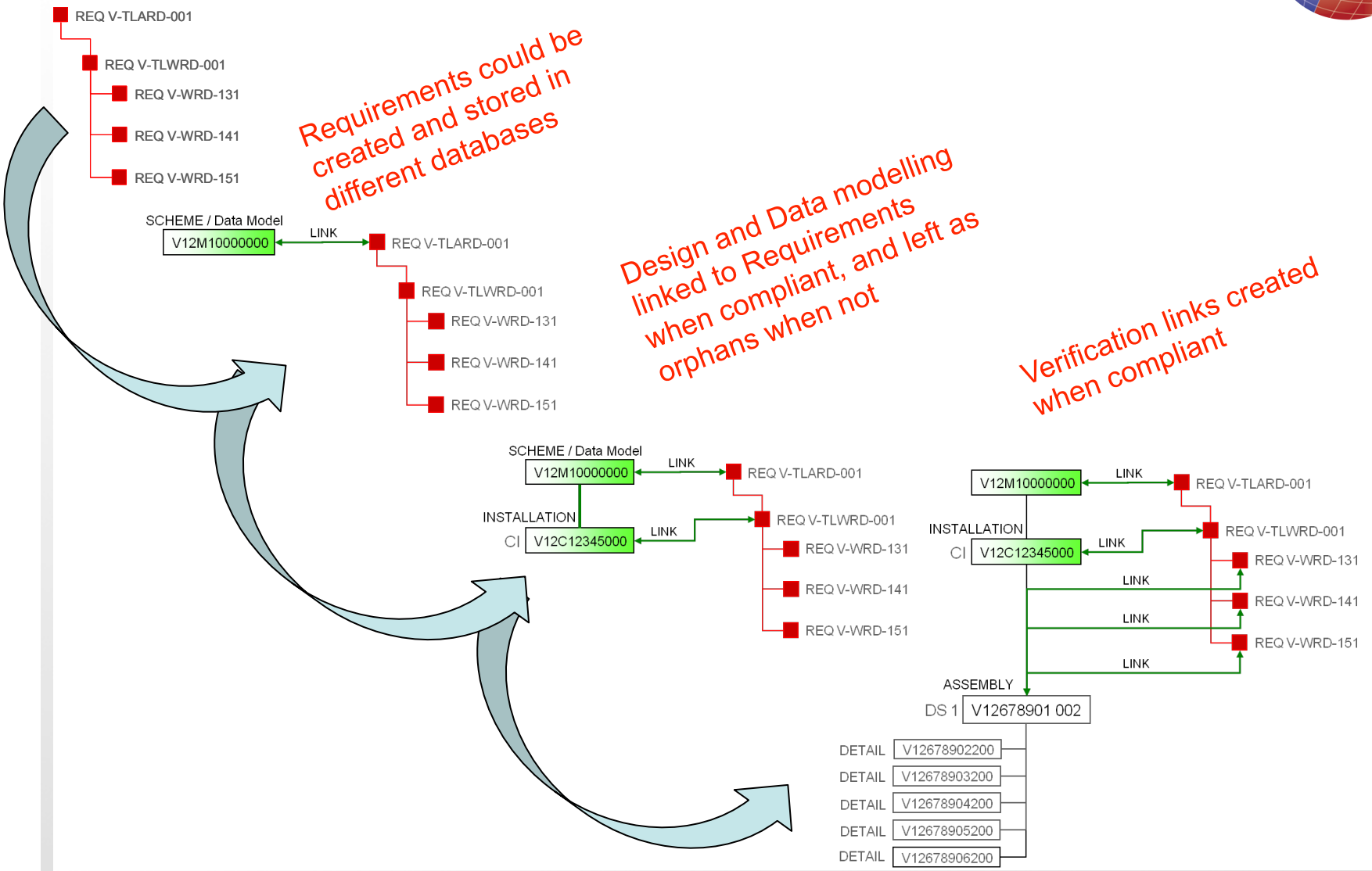

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Conclusion

- ✓ Requirements and related issues are crucial for the success of development projects or programs in the SE context.
- ✓ CM is widely accepted as a key discipline to establish this traceability and enable controlled baseline evolutions or iterations within the development process; and thereby, CM supports and enables SE.
- ✓ In the feasibility and concept phases CM often excludes requirements.
- ✓ CM shall cover the traceability between the requirements, design and product baselines throughout the entire life cycle; however the effort of CM involvement should be adjusted to early program phases.
- ✓ In many companies a high percentage of effort is spent to recover inconsistencies between the requirements and product baselines that could be avoided by properly applied CM.
- ✓ The creation of a dedicated CM INCOSE working group should be considered in order to further promote and integrate this engineering discipline into the SE context.

Thank You