



Data Management Challenges of CPU Design

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Agenda

- Introduction
 - Problem Scope

- Silicon Stepping Methodology
 - Requirements
 - Reduce, Reuse and Recycle
 - Workflows

- Conclusion
 - What did we accomplish?

- Q&A



Introduction

Problem Scope

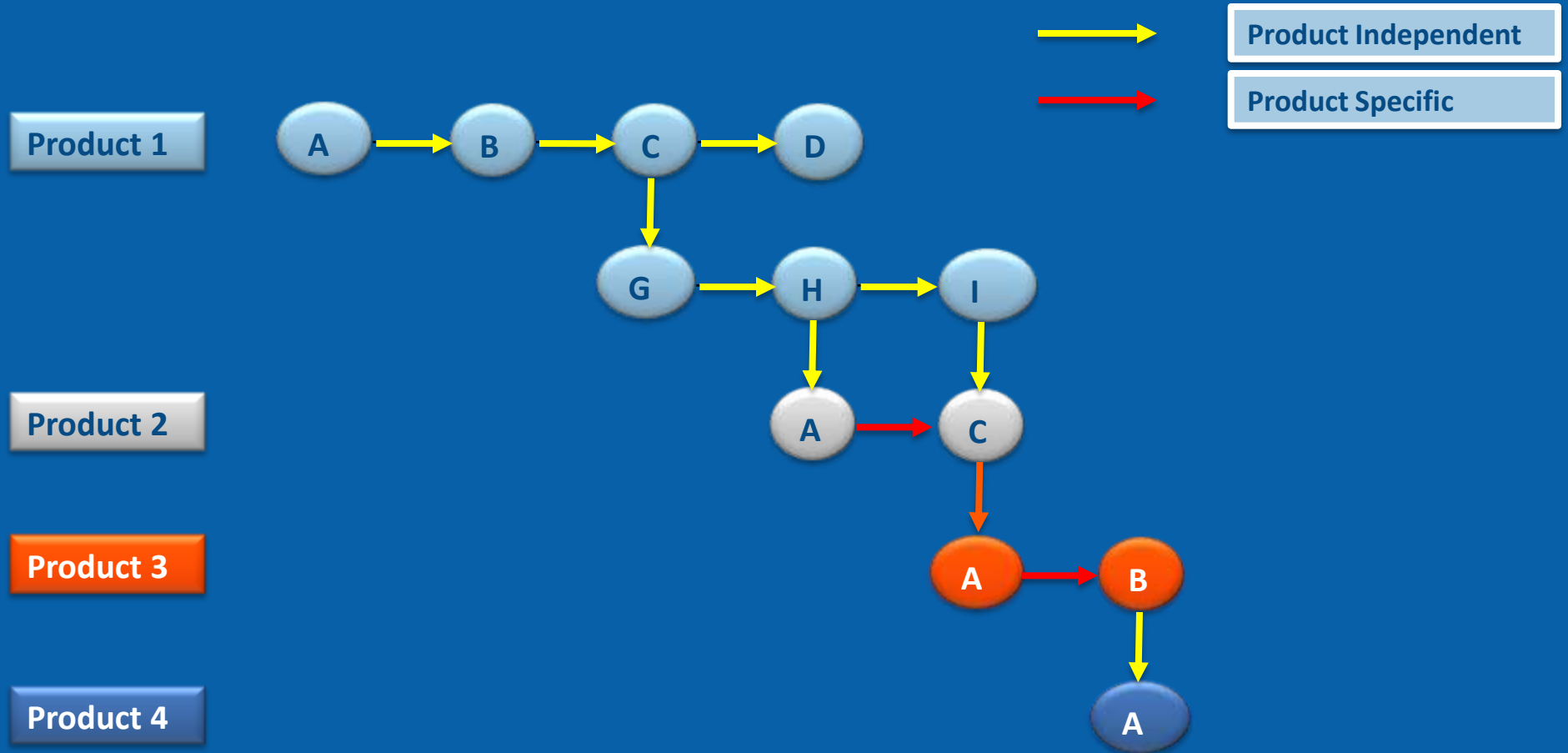
- Multiple silicon steppings and incremental improvements
 - Design Cost and Performance
- Multiple product configurations and design reuse
 - Time to Market for multiple customer segments
- Concurrent development of different product configurations
 - Design Productivity
- Flexibility: adapt to changing requirements
 - Market needs move during design and production cycle

Past Project – A look back

- Started as a 1 product configuration
- By the end, there were 4 different product configurations for 3 different market segments
- Challenges included
 - Efficient design reuse across
 - Product configurations
 - Steppings
 - Multi-geo development sites: a fact of life now...

Need to understand and prevent Chaos

Past Project - Design Inheritance



Past Project - Stepping Methodology

Data inheritance from reference steppings

- Product independent v/s product specific inheritance
- Inheritance maintained using links
- Edits enabled by making copies

Reused design data that didn't change across steppings and product configurations

Multiple sites maintained using edit access controls and nightly synch ups

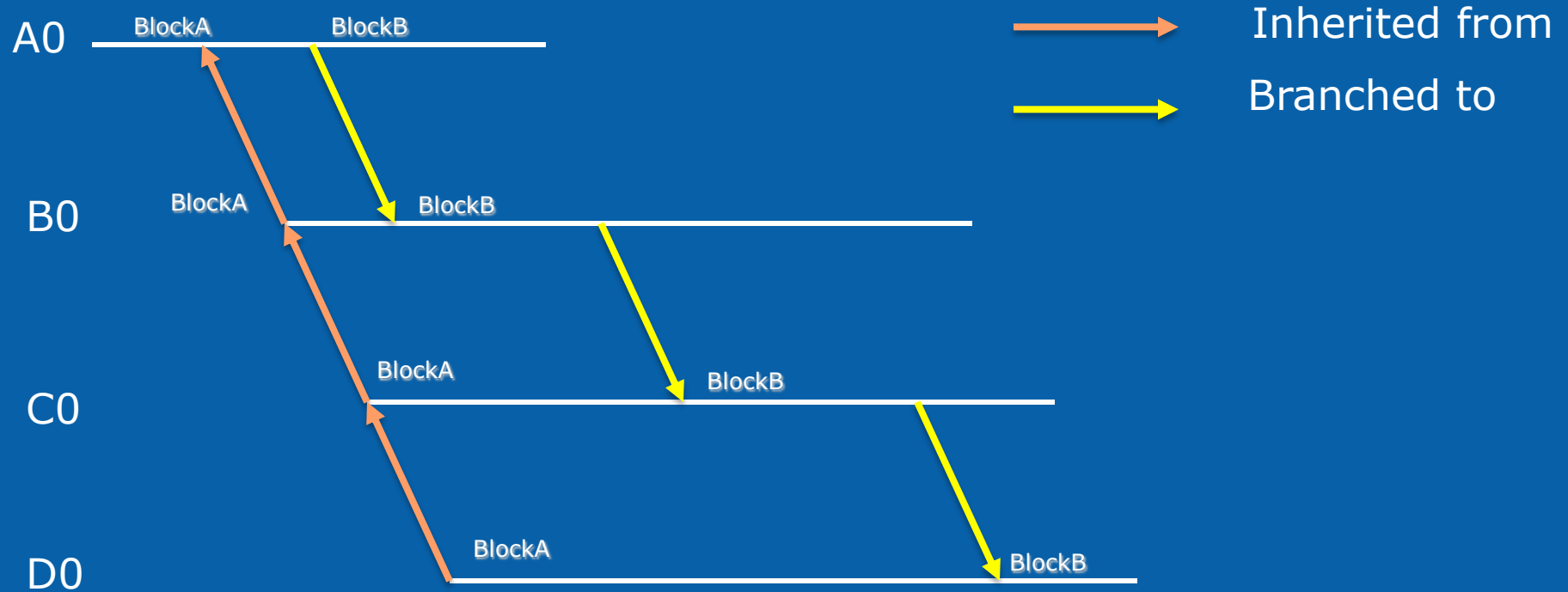
Reigned in Chaos to bring Stability

Current Project - Requirements

Support for

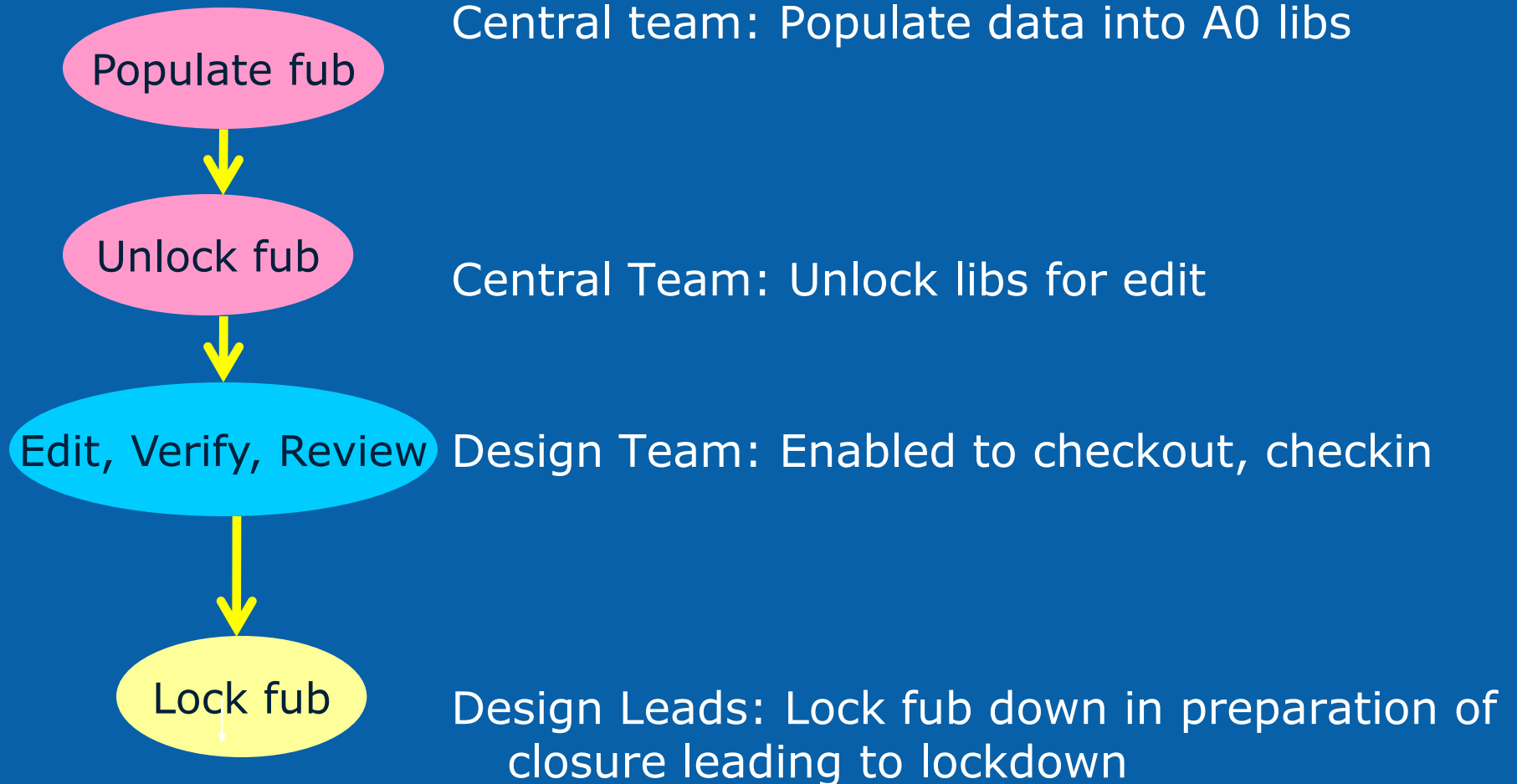
- Concurrent development
- Reuse of data across steppings
- Multi sites, multi steppings, multi products
- Reuse at the smallest manageable granularity

Current Project - The Philosophy



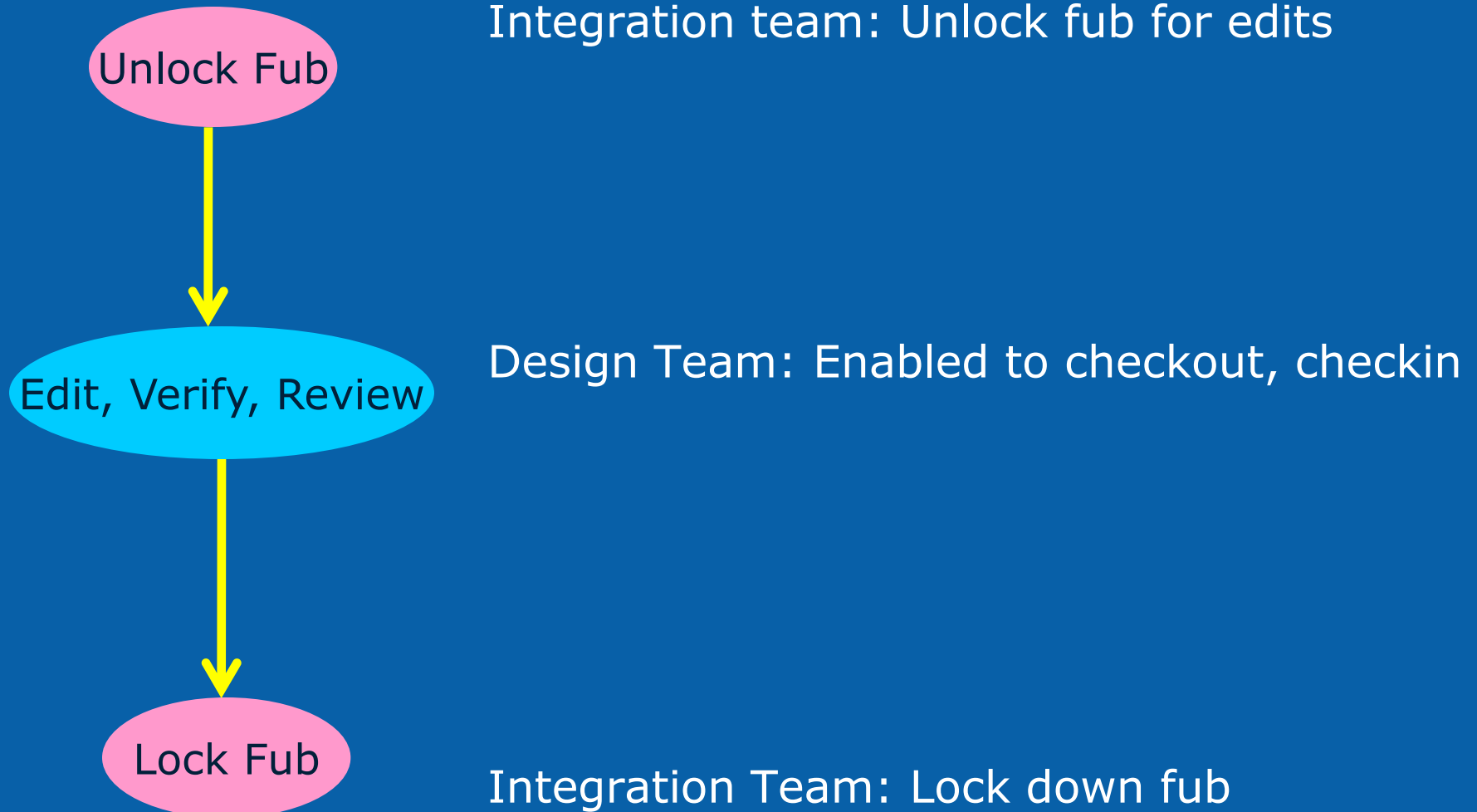
Leverage reference project as long as possible

A0 Workflow

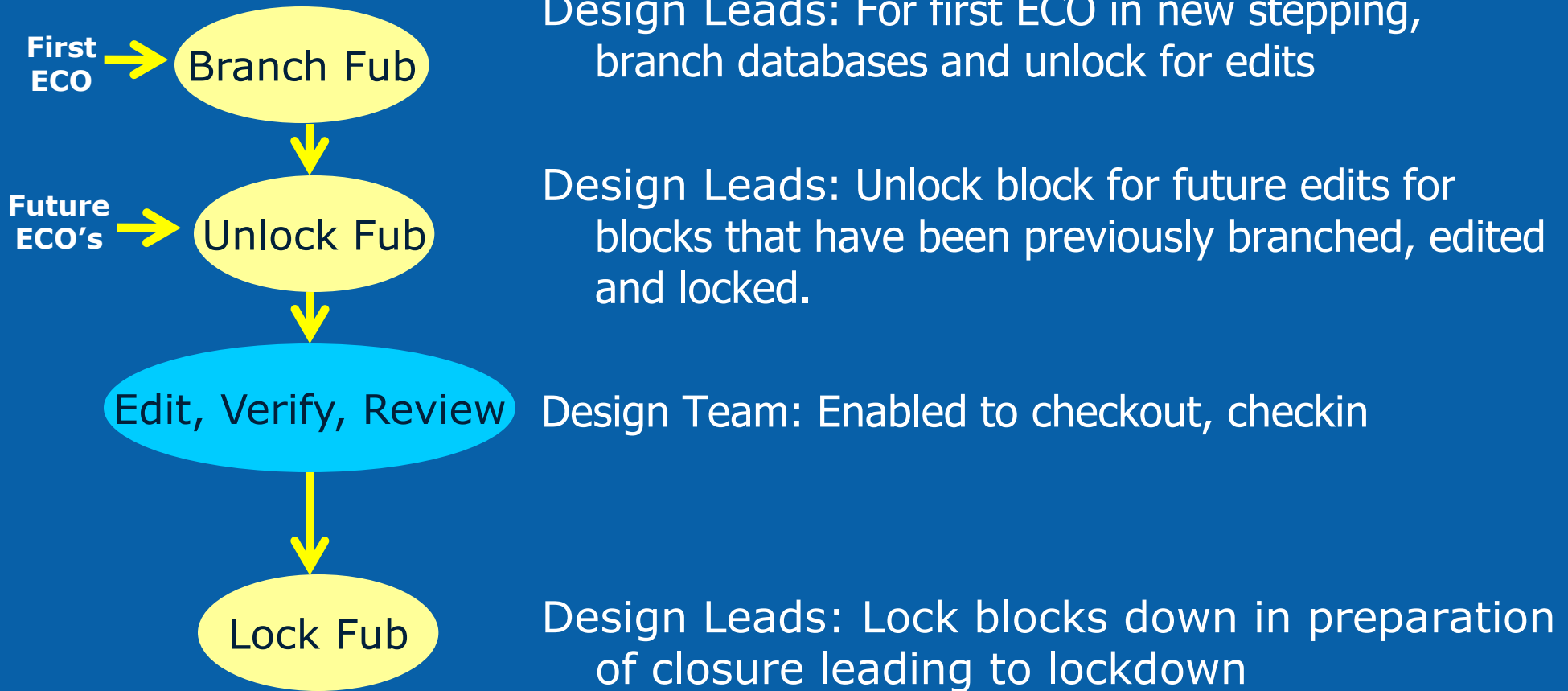


FUB = Functional Unit Block, anywhere from 10K to 500K devices

Minor edits Stepping Workflow



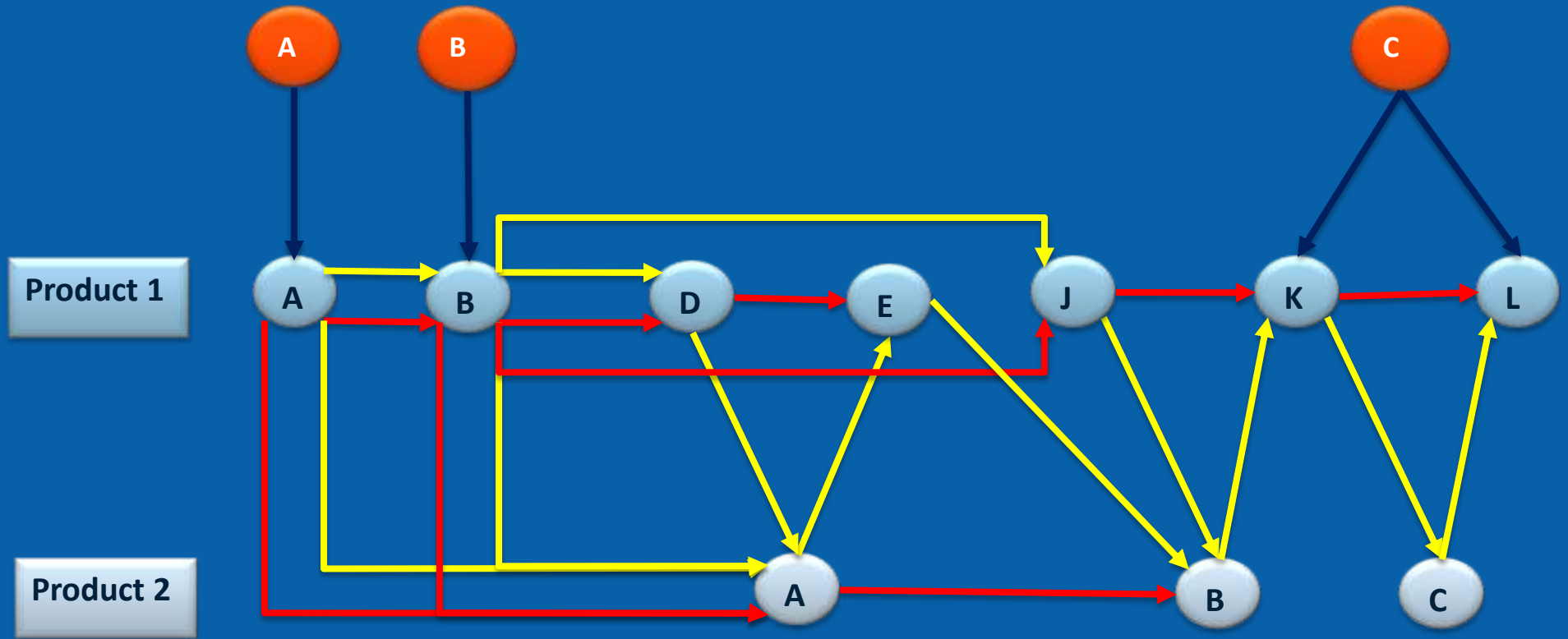
New Stepping Workflow



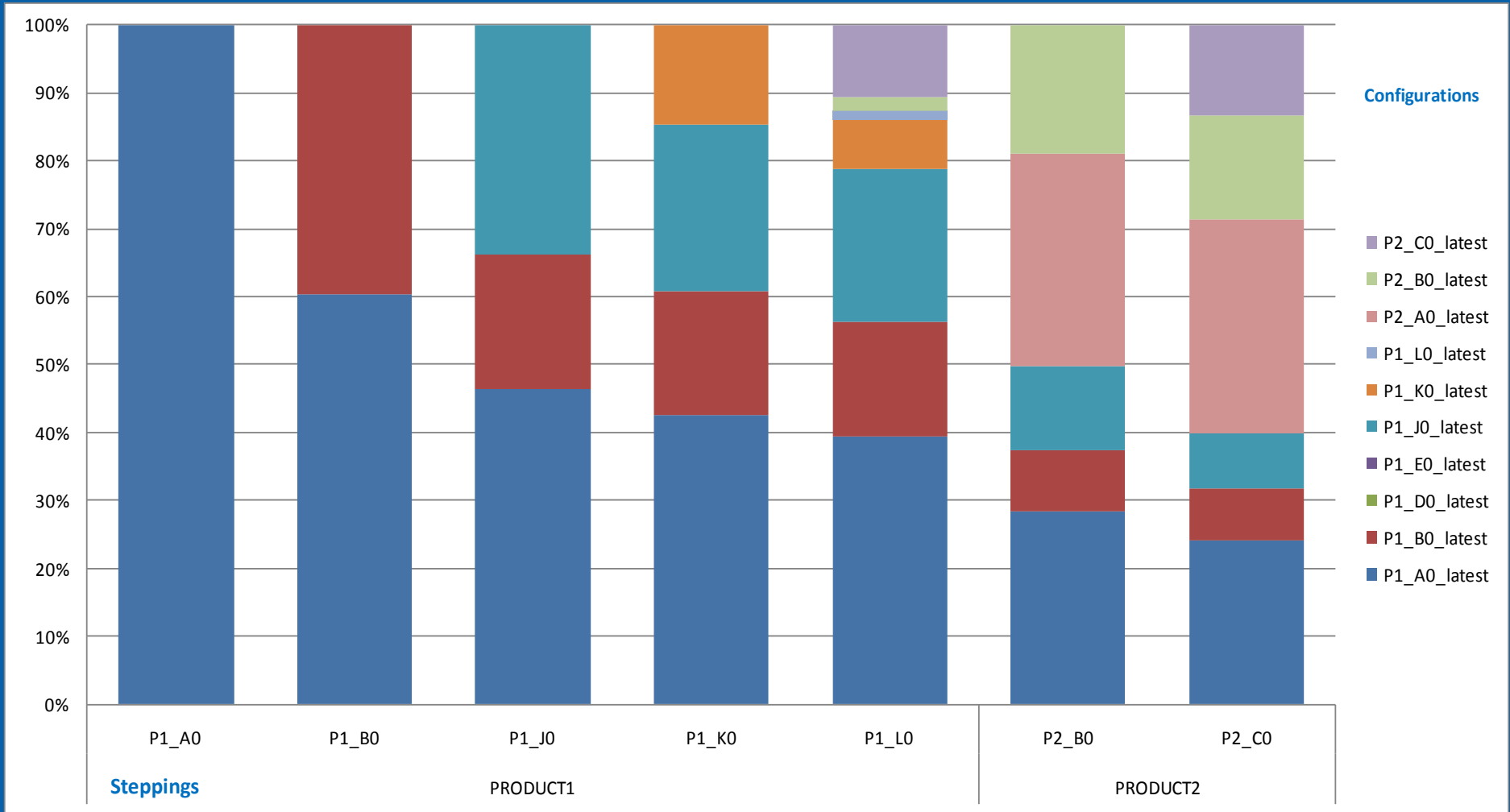


Conclusion

Recent Project - Design Inheritance



Recent Project – Reuse across steppings



Q&A