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Beyond the Code: Lessons Learned in Software Reuse

GSAW

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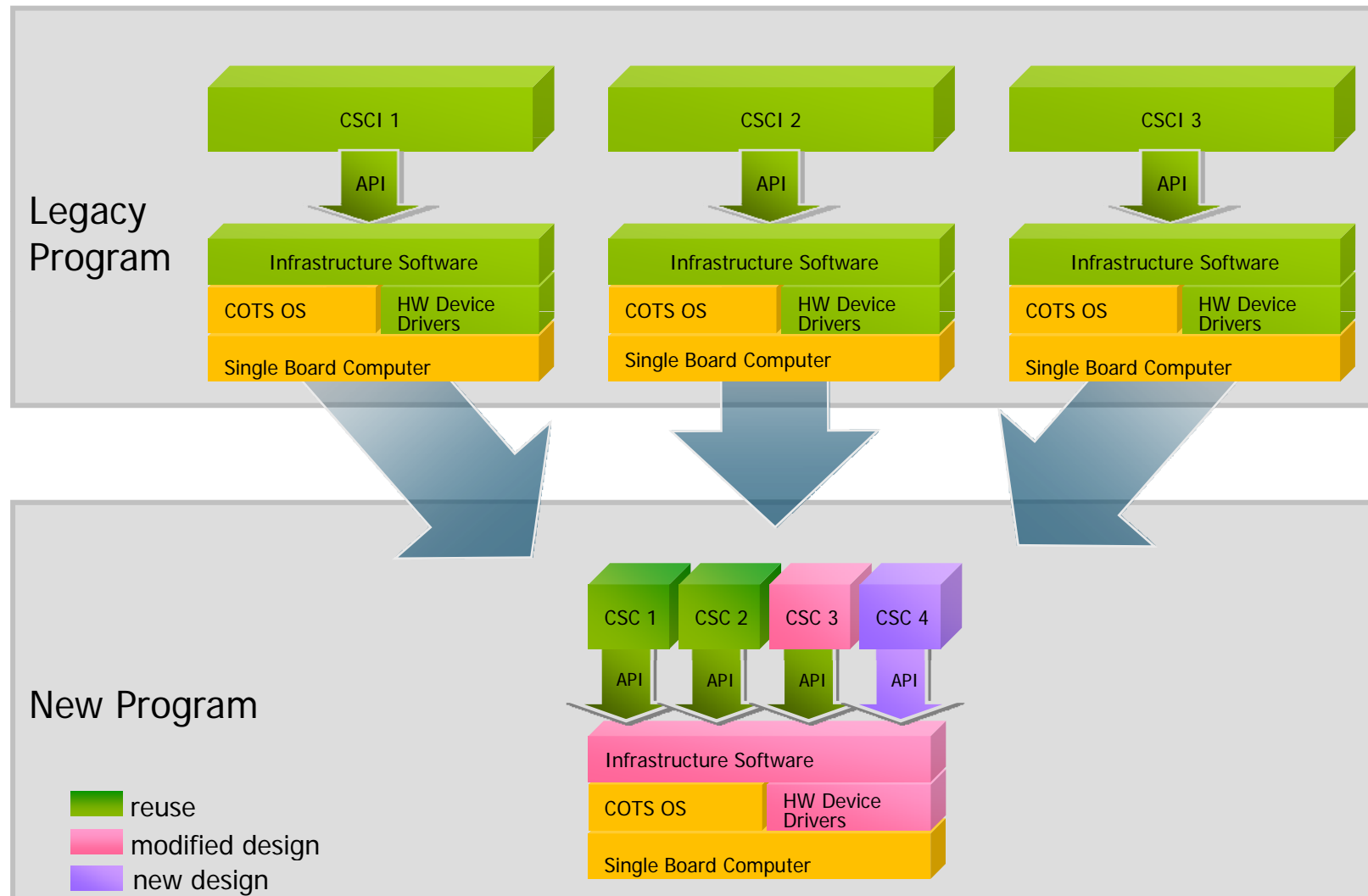
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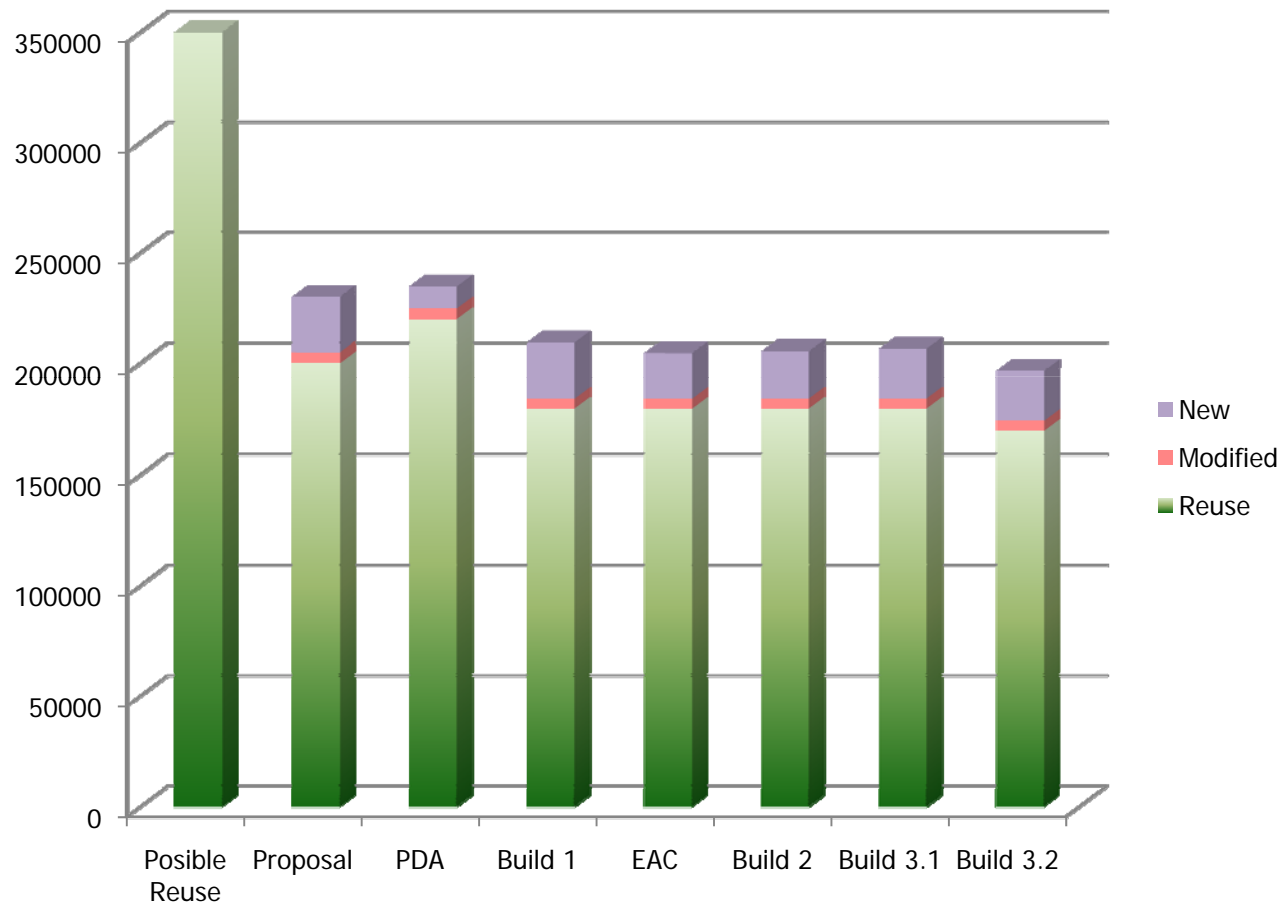
Beyond the Code: Lessons Learned in Software Reuse

- Software reuse example
 - From large existing program to a new program
- Software reuse success factors
 - Code Design
 - Process
 - Stakeholders
 - Standards
- Success achieved by planning for these factors
- 83.7% of final codebase was reuse
 - Leveraging embedded software not explicitly designed for reuse

Our Challenge: Achieve high reuse across two architectures



Software Reuse - Final



83.7% of final codebase was reuse

Reuse of Legacy Design Guidelines

- Message based Inter-task Communication Model
- No shared memory
 - All memory pre-allocated and locally managed (no dynamic objects)
- Keep it simple, stupid (KISS)
 - No Templates
 - No Multiple Inheritance
- Isolate HW and System dependencies
 - Wrappers for OS
 - APIs for all CSCs

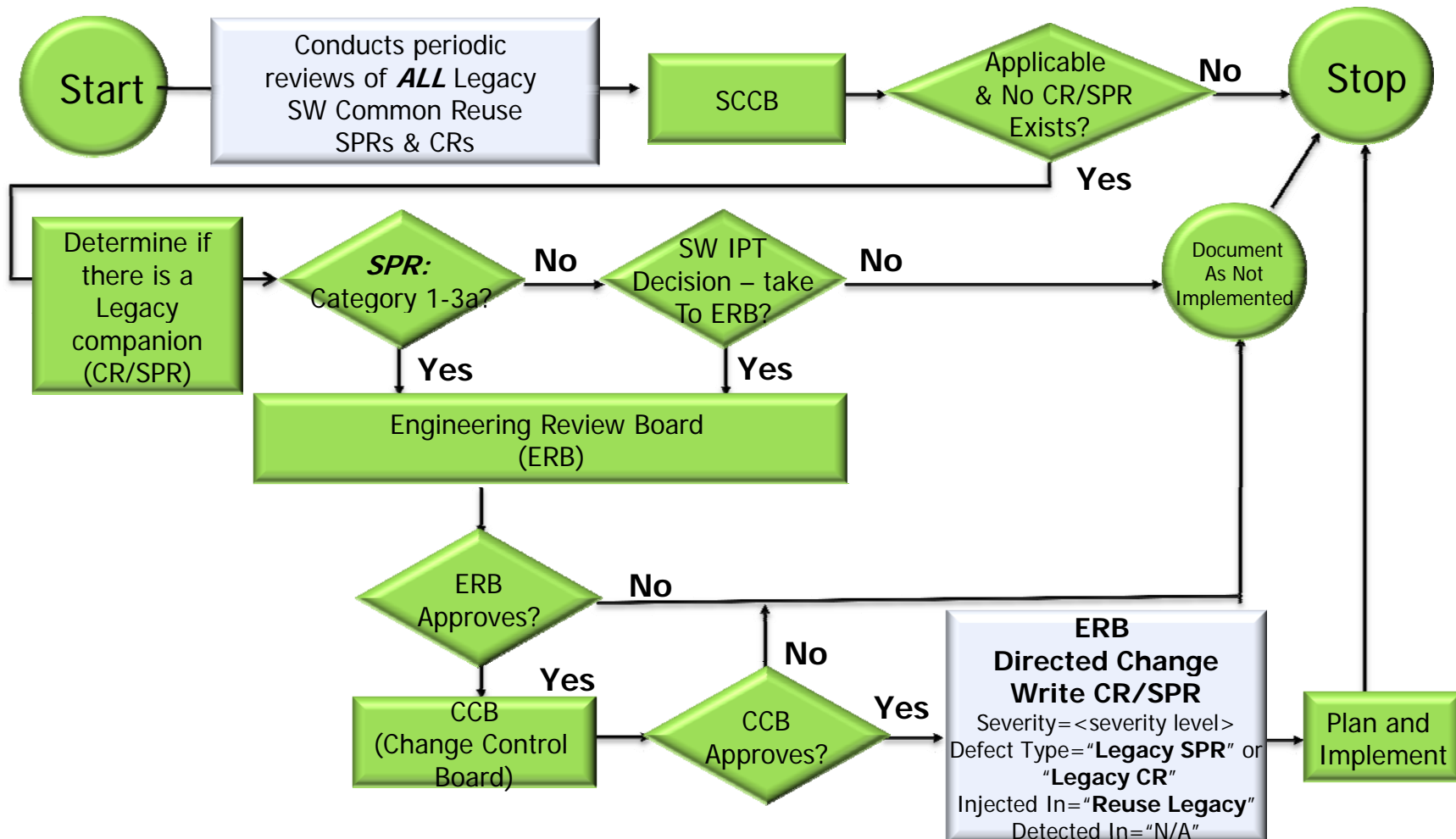
Design Guidelines Developed for Robust Product

Lessons Learned (1 of 2)

- Process

- Establish process and enforce across lifecycle
- Maintain full alignment between Legacy Engineering Review Board (ERB) and New project ERB
- Provide incremental builds to HW Integration and Test to enable early identification of problems/disconnects
- Strengthen FQT effort by
 - Advanced preparation and coordination key to success
 - Entry/Exit criteria, roles, expectations, rules of engagement
 - Conducting Dry Runs in parallel to software development
 - Protect schedule
 - Facilitate early identification of problems

Maintaining Common Reuse Alignment



Proactively Focused on Maximizing Legacy Alignment Benefits

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Lessons Learned (2 of 2)

- Stakeholders
 - Build on both product reuse and knowledgeable staff from Legacy program
 - Understand and negotiate early what constitutes acceptance with customer

- Standards
 - Develop requirements with verification in mind
 - Address Firmware early in order to prevent schedule and cost uppers
 - Document Assumptions to enable Program and Working Group visibility into key areas requiring resolution

Summary

- Software reuse success factors
 - Code Design
 - Process
 - Stakeholders
 - Standards
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Lessons can be applied to other reuse programs

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