

# SoC Design Productivity with Data Management

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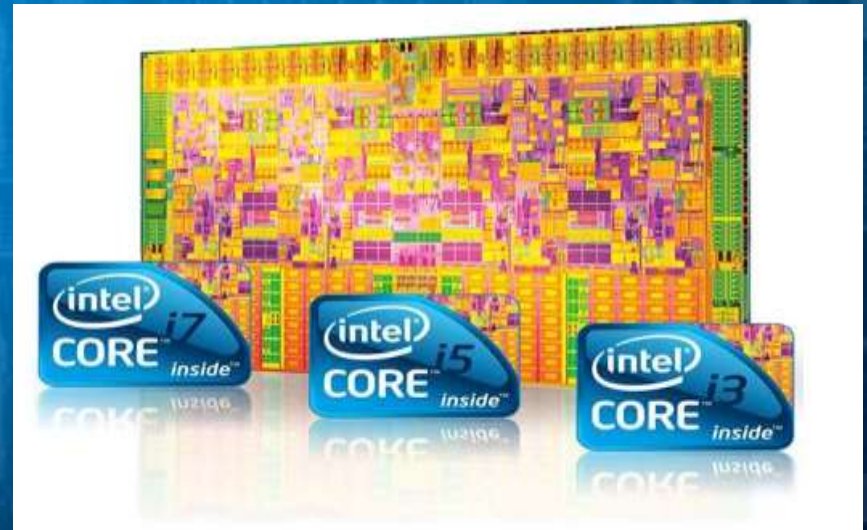


# About my org



Based in Oregon  
Multiple IP Providers

Team that designed the original  
Core i3, i5, i7 products



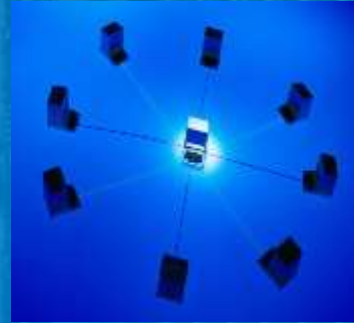
# About my team's role



Design Environment



Data Management

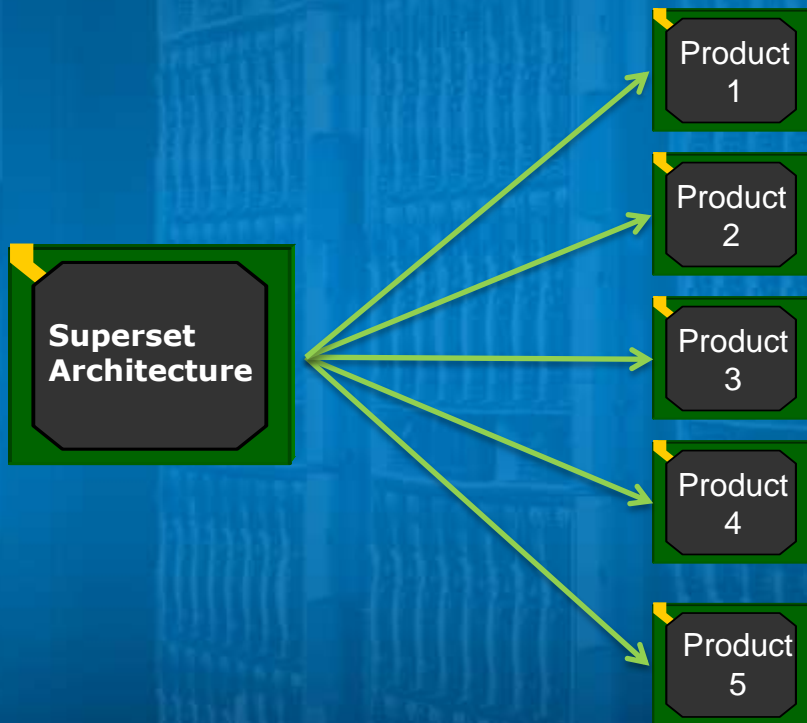


Central Verifications



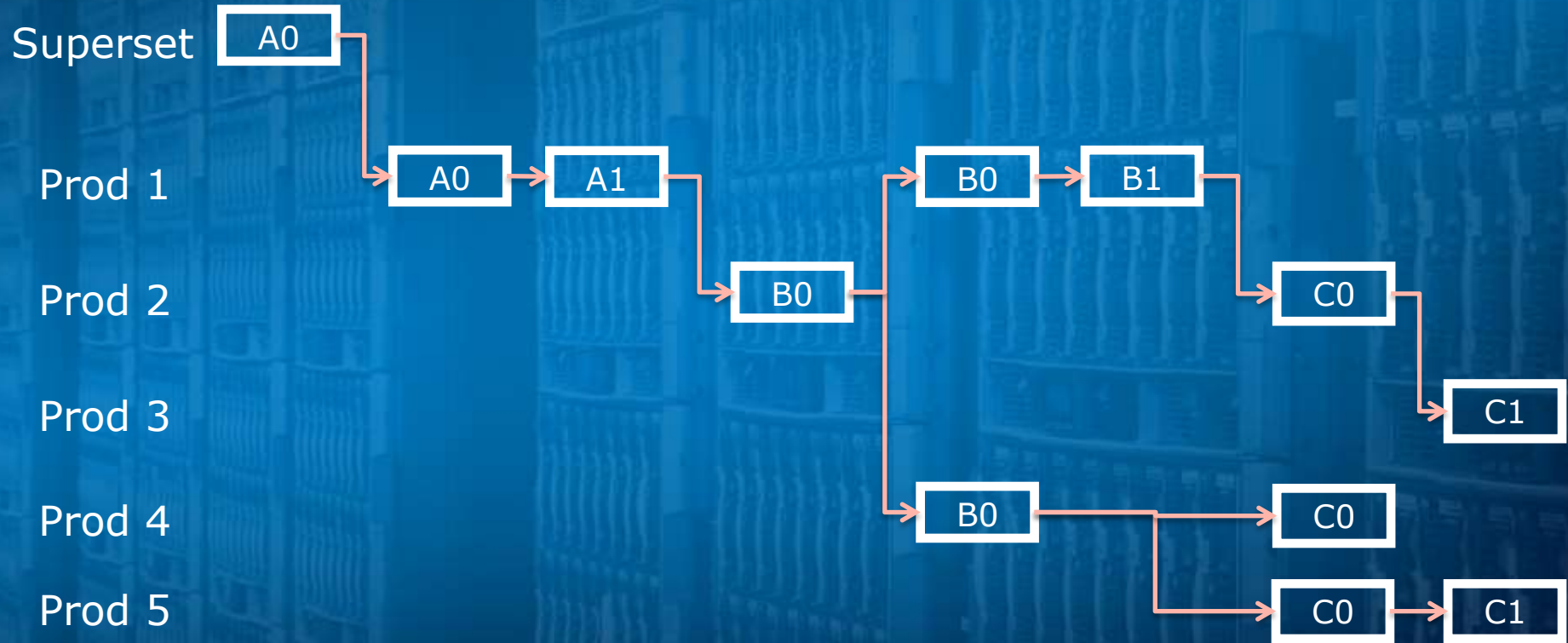
Multi Site Operations

# Vision from 4 years ago



Design a superset architecture to derive multiple products

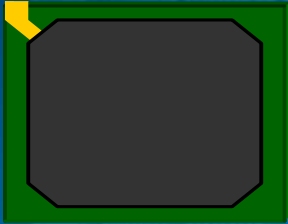
# Vision from 4 years ago – cont.



Order of products, number of products both subject to change



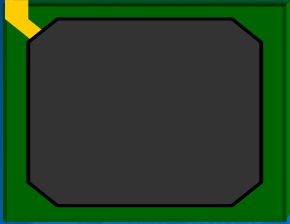
# Challenges



- Each product has ~1000 blocks x ~5 views
- Less than 10% product specific changes
- Existing methods tracked designs at lowest of detail
- Order of product tape outs to be decided late
- 2 week window between product tape outs
- Headcount and Computing budgets stay flat



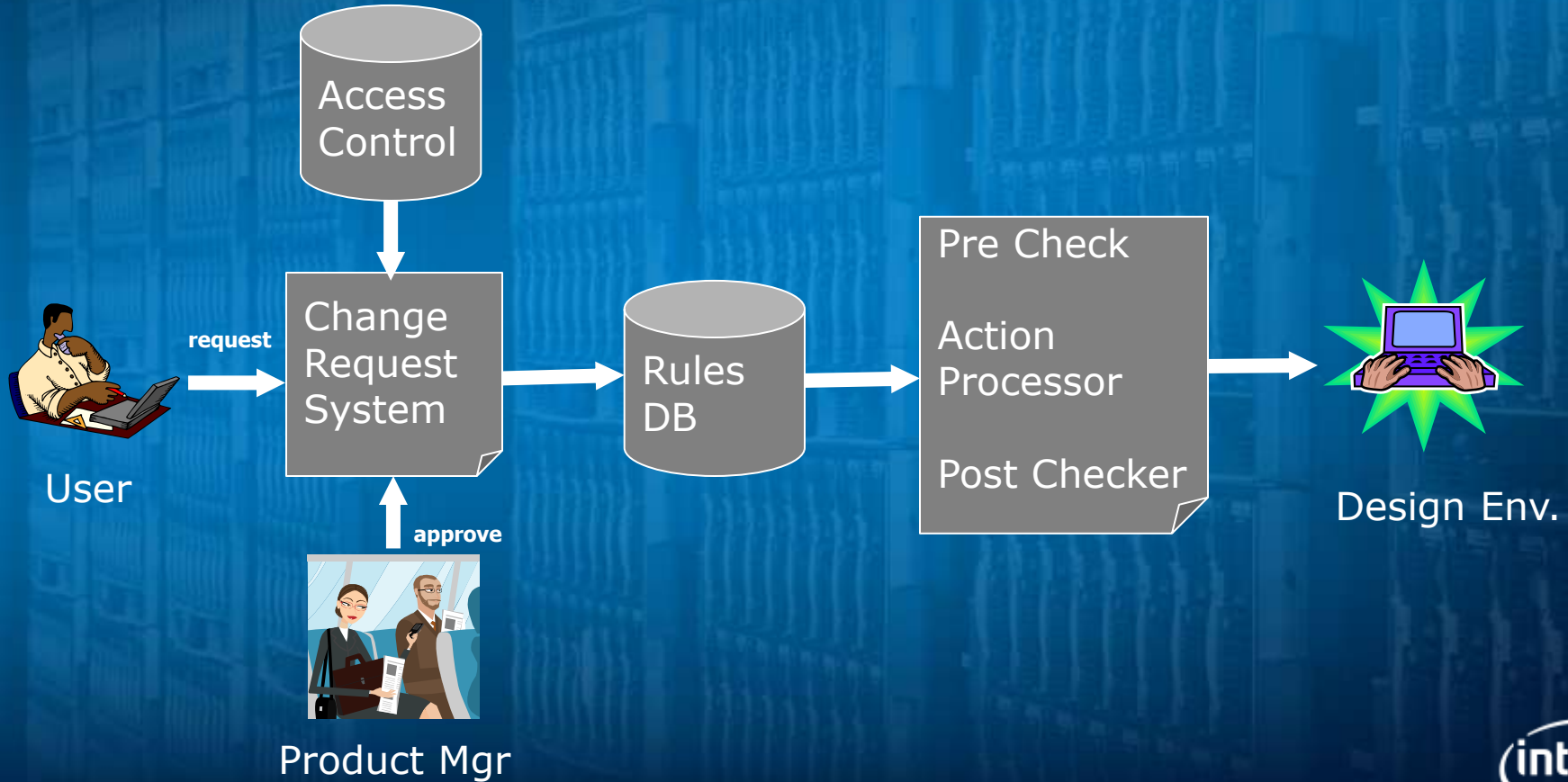
# Solution



- Database to track rules and state of each block
- Role based Access Control
- Approval based Change Request System
- Multi site Change Processor
- Dashboard to monitor health and progress

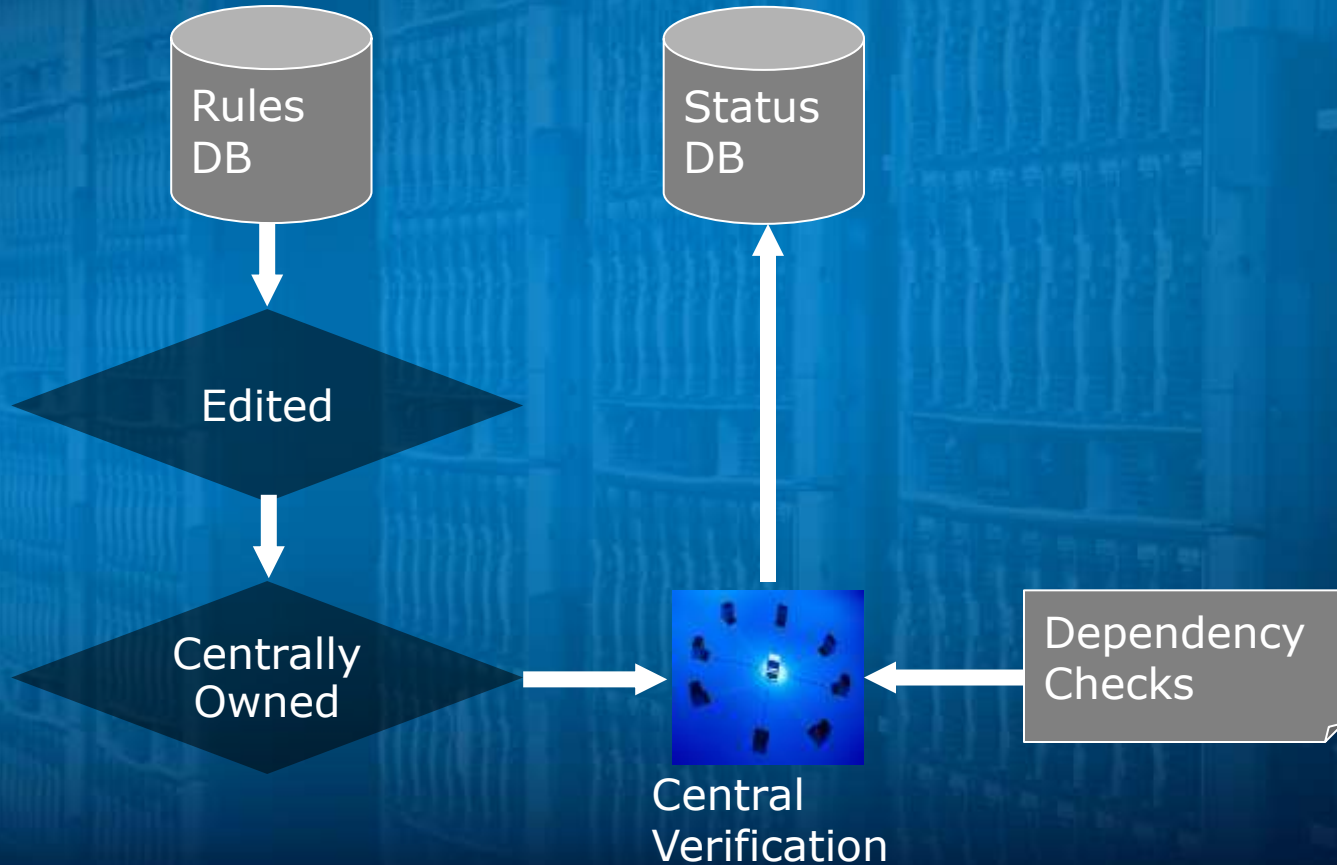


# Designer Flow



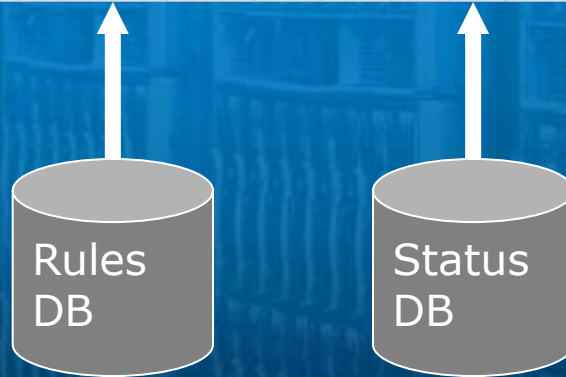


# Central Verification Flow

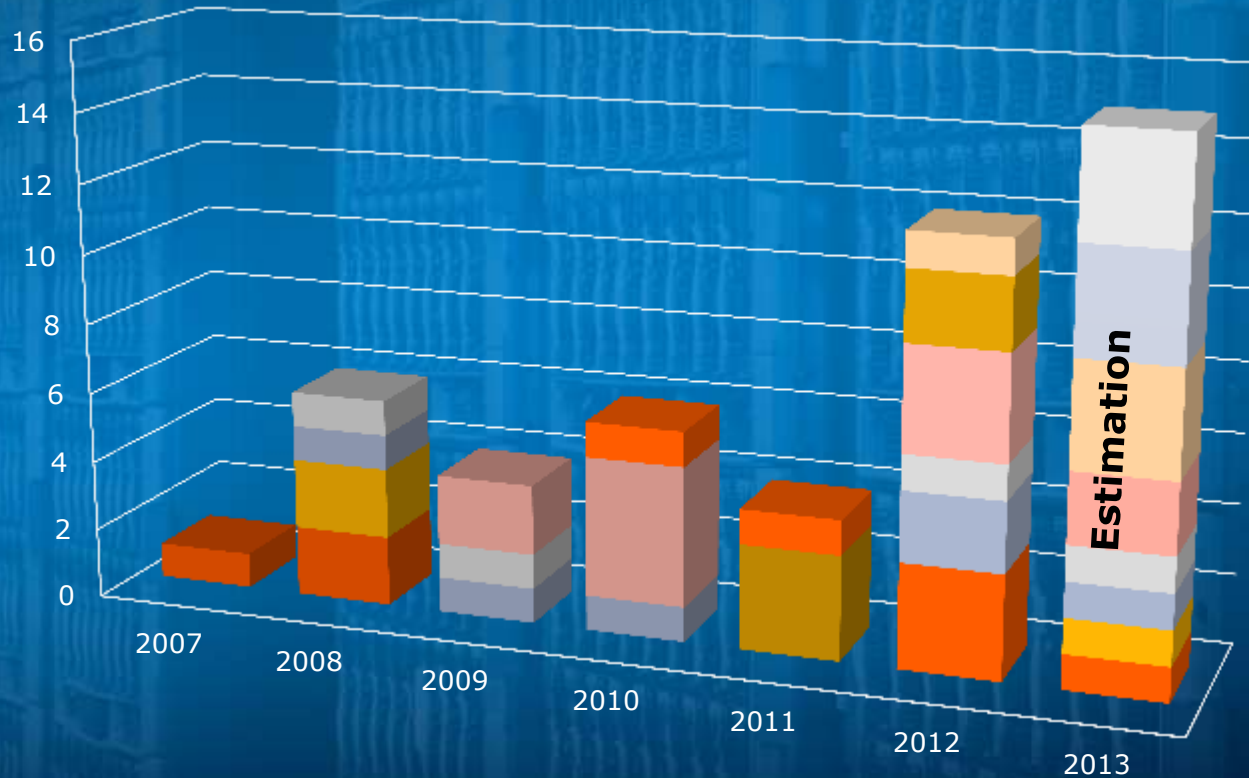


# Dashboard

template	branch	FE	PWR	LV	RV	DReview	cdrlay	clock	dehlth	delib	fev	lowvcc	mco	mpp	mux	noise	pwr	qual	rf
[REDACTED]	SLCTNA	C	C	C	C	7/20/12		pass	pass	pass	pass	pass	pass	pass	pass	apprv	pass	pass	
[REDACTED]	---T--	C	C	C	C	7/21/12		pass	pass	pass	pass	pass	pass	pass	pass	apprv	pass	pass	
[REDACTED]	---T--	C	C	C	C	7/21/12		pass	pass	pass	pass	pass	pass	pass	pass	apprv	pass	pass	
[REDACTED]	---T--	C	C	C	C	7/23/12		pass	pass	pass	pass	pass	pass	pass	pass	apprv	pass	pass	
[REDACTED]	---T--	C	C	C	C	7/26/12		pass	pass	pass	pass	pass	pass	pass	pass	apprv	pass	pass	pass
[REDACTED]	-----	C	N	C	C	8/2/12		pass	pass	pass	pass	pass	pass	pass	pass	apprv		pass	
[REDACTED]	-----	C	N	C	C	11/28/12		pass	pass	pass	pass	pass	pass	pass	pass	apprv		pass	
[REDACTED]	---T--	C	C	C	C	7/22/12		pass	pass	pass	pass	pass	pass	pass	pass	apprv	pass	pass	
[REDACTED]	---T--	C	C	C	C	7/23/12		apprv	pass	pass	pass	pass	pass	pass	pass	apprv	pass	pass	



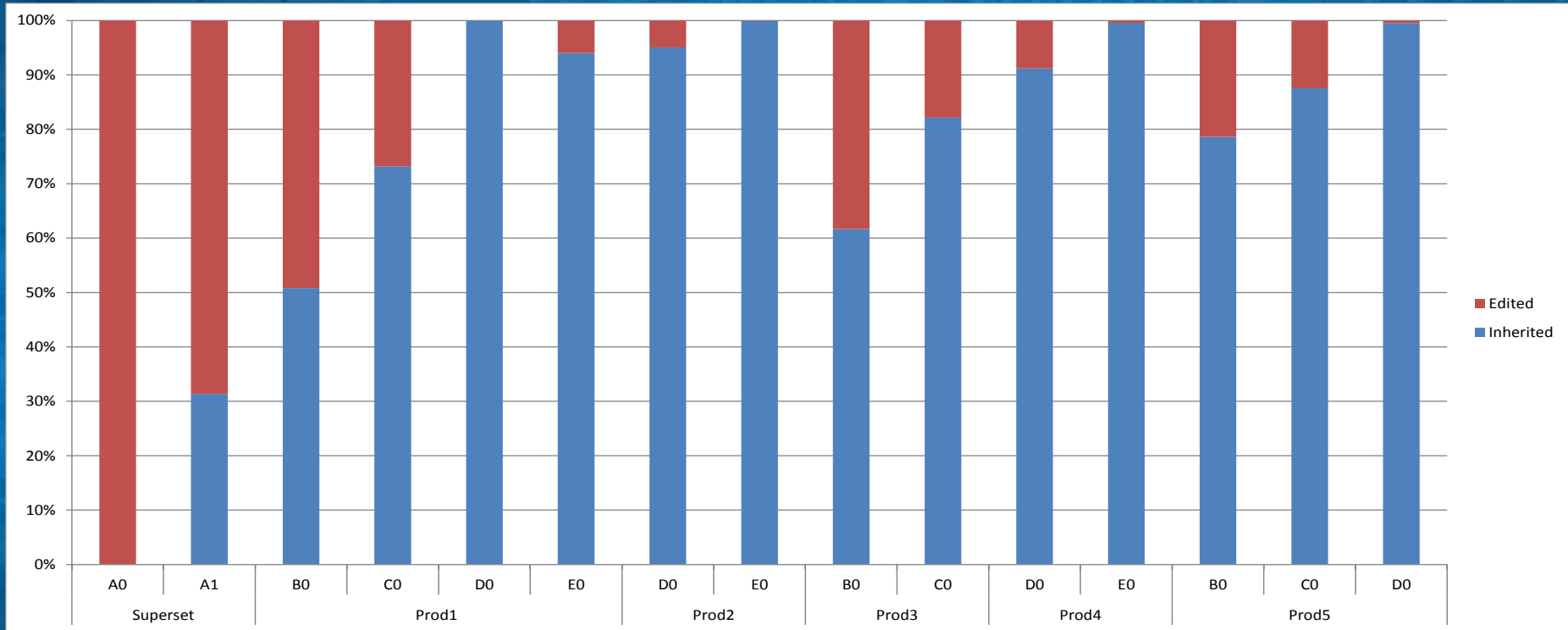
# All layer tapeins over the years



Doubled the number of tapeins in 2012



# Inherited vs Modified



Higher reuse, lower cost, faster turnaround



Thanks



# Rules Database

- Lists every block in each product
- For each block lists various attributes
  - inheritance, sharing rules
  - branched, locked
  - DE or Central Team owned
- For each block tracks status
  - Who/when requested a change
  - Who/when approved the change
  - When change was completed

# Role Based Access Control

- A configurable system to describe roles and the change request function they have access to
- Three roles we have used

Role	Access
Designer	Can request change requests like branching, unbranching, locking and unlocking.
Product Manager	Approve change request actions like branching, unbranching, locking and unlocking. All requests filed by Stepping Managers are auto approved
DB Admin	Least restrictive, has access to all change request actions

# Change Request and Processor

- To change an attribute or status for a block a change request must be initiated
- Based on role, some change requests require approval while others get auto-approved
- Upon approval, multiple action items are created for the processor to handle
  - Pre-checks
  - A list of actions, one per supported site
  - A post-checker
  - Notify the submitter