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# Critical Chain

A variation on a theme or a significant difference?

*Ian Heptinstall - Associate Professor of Project Management*



# Critical Chain?

*“An interesting idea, but nobody is using it.  
Surely if it was any good, everyone would be using it”*

- What is it?
- Who is using it and what they say about it
- The Yin-Yang of Project Control



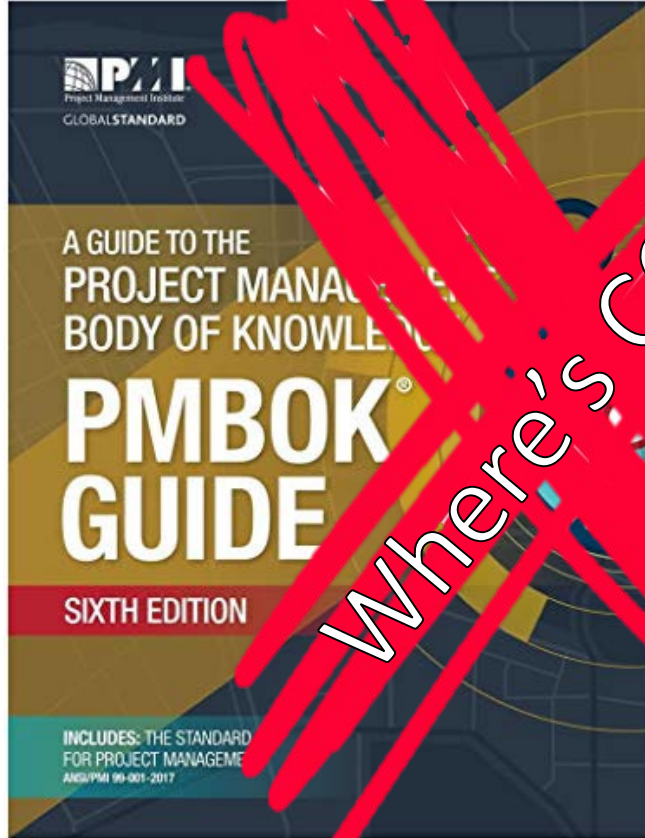
# Why “*best practice*” may not be the best.

- “**consensus is almost always wrong** ... it is in the slipstream of the fore-front thinkers and observers.” *Eddie Obeng*
- “Don't take refuge in **the false security of consensus**, and the feeling that whatever you think you're bound to be okay because you're in the safely moral majority.” *Christopher Hitchens*





# 2017



# 2019



PMI Project of the Year Award 2019

WINNER

**E190-E2 Program Development  
Embraer**

SÃO JOSÉ DOS CAMPOS, SÃO PAULO, BRAZIL

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“Critical chain gives us commercial advantage in ... project management. We are more-and-more committed to using it in all our project management applications.”

Mauricio Martins de Almeida Filho – Engineering VP, Commercial Aviation



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“Technology development was our strategic constraint. Critical chain was vital to achieving the environmental performance targets on SKYACTIV. It was the key to turning the company around”

Seita Kanai, Chairman, Mazda Motor Corporation



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# Not only used on massive megaprojects



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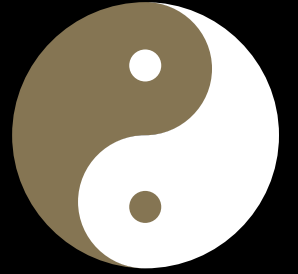
# So what is Critical Chain?

- Formal techniques for scheduling and monitoring/control
- Work flow management practices and behaviours
- Developed from Goldratt's Theory of Constraints. *The Goal*





# 1: The Principles of Project Work Flow



- Focus & Finish
  - Multi-tasking is Evil
- Limit WIP
  - Project Tasks & Portfolio projects
- Relay Runner
  - Pass work on ASAP
- Full Kit
  - Only start if you can finish
- Separate project & task plans
  - Project at “Level 2/3”
- Commit to how you will work
  - Not achieving task-level estimates.
- Frequent reporting
  - Daily/weekly
- Small Batches
  - Pass work on ASAP
- Continuous Improvement
  - Rapid cycles. PDSA



# Baltazar Martinez

## South Valley Landscape, California

- Focus and Finish
- Stop starting and start finishing
- 28 open jobs -> 4-6
- Durations halved
- Turnover up 50% in 1 year
- Same team
- 70+-hour weeks to picking kids up from school





# GSK UK

- Critical chain pilot for new product introduction.
- Now used across all NPI projects.
- Senior stakeholder confidence & reduced micro-management.



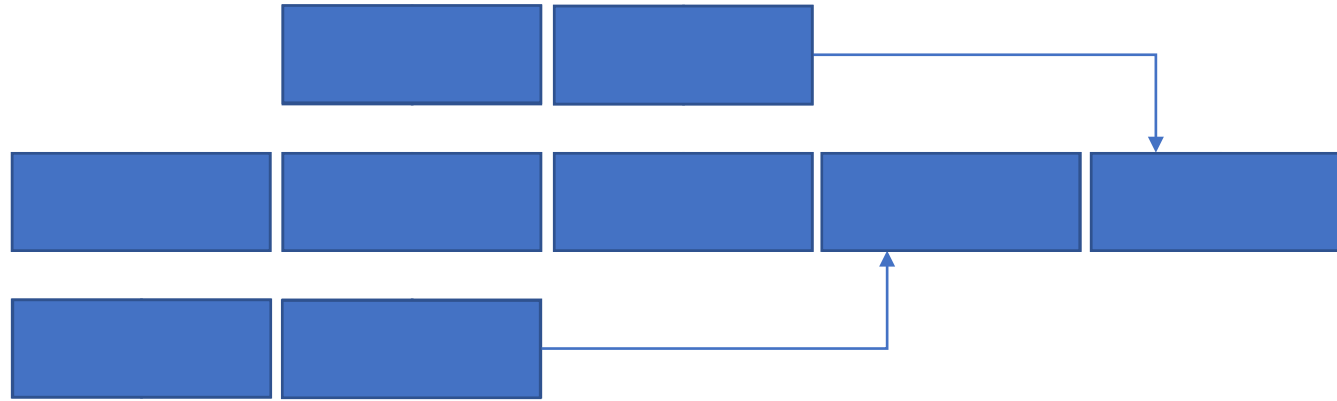


## 2: The formal technique of CC

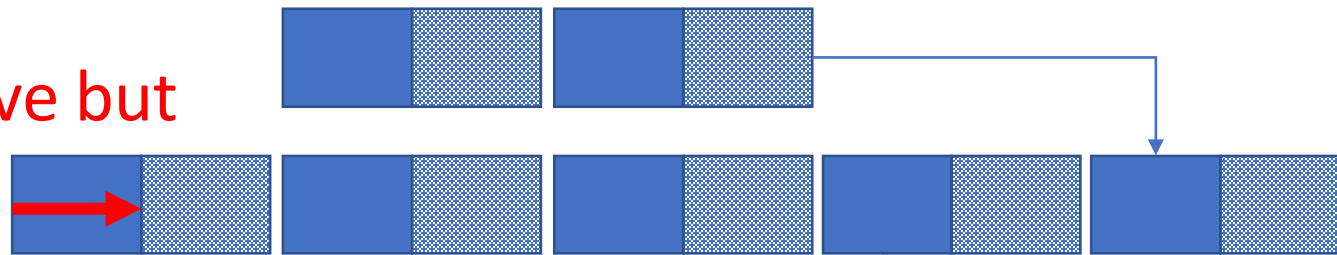
- Buffered Schedules
- Buffer Management – Key Project Progress Metric
- Portfolio Staggering
- Built on foundation common to all projects
  - *Task dependency network*
  - *Pull – Right-to-Left - Scheduling*



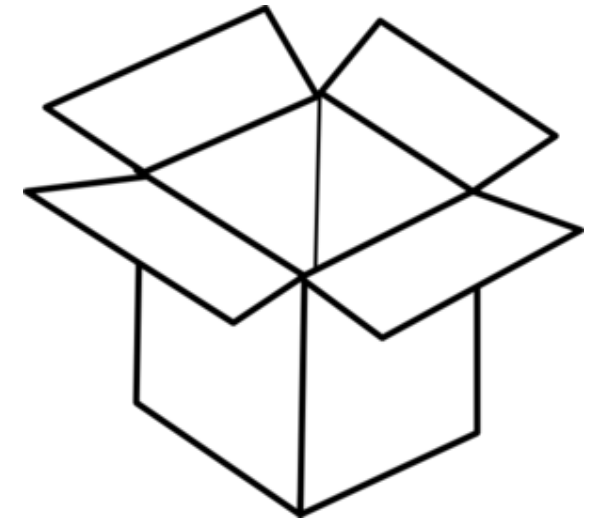
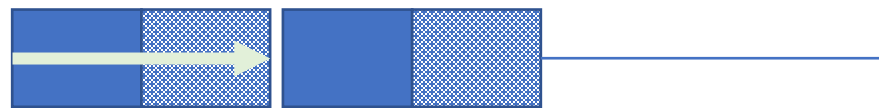
# BUFFERS: Shared Safety

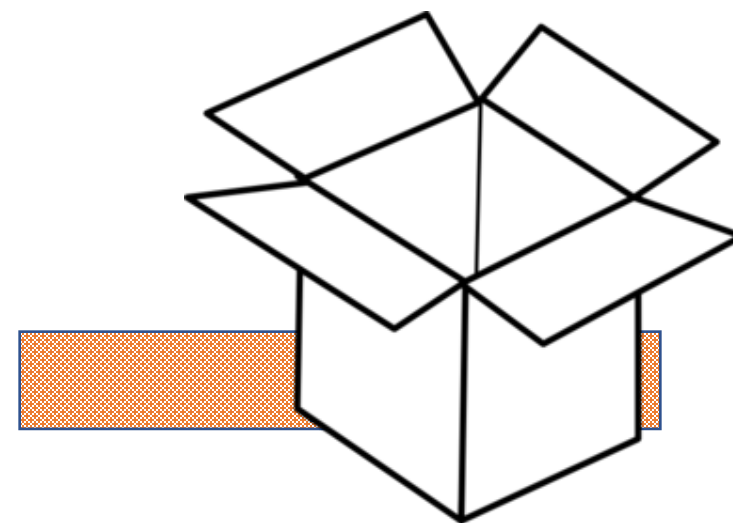
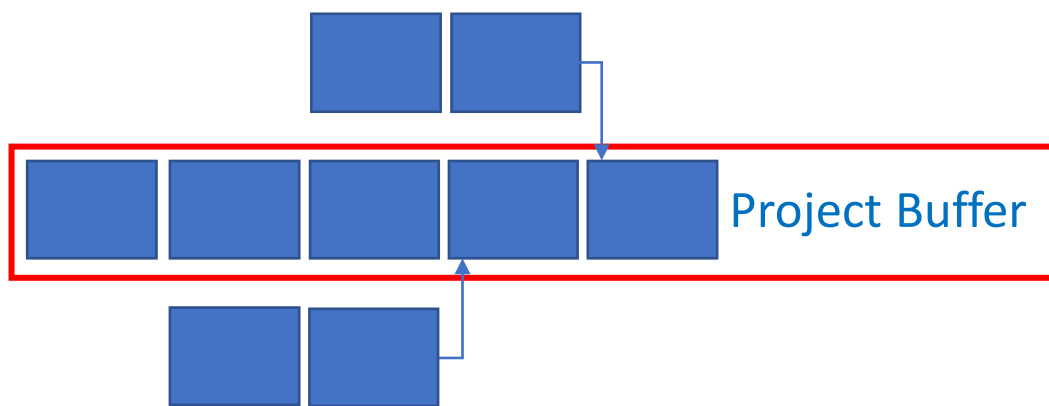
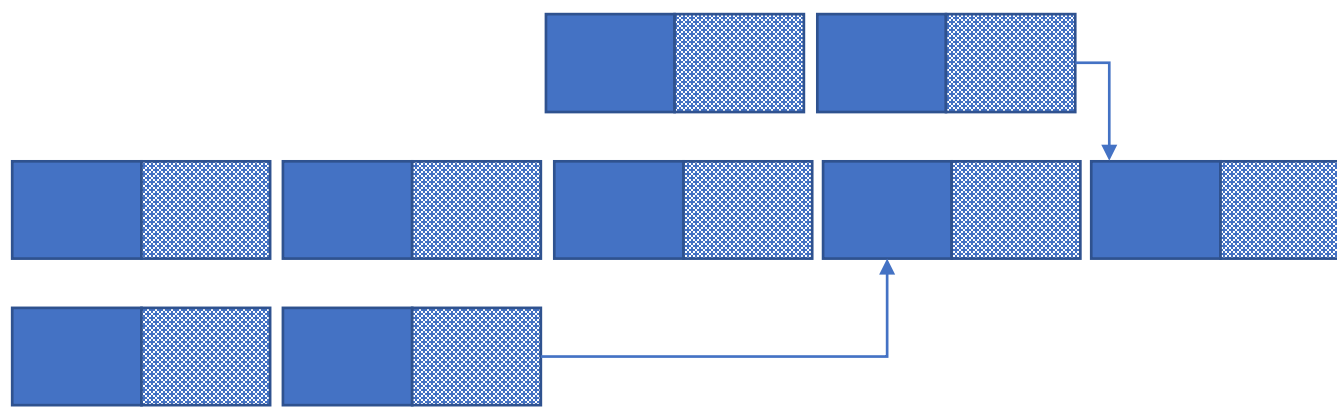


Aggressive but  
Possible



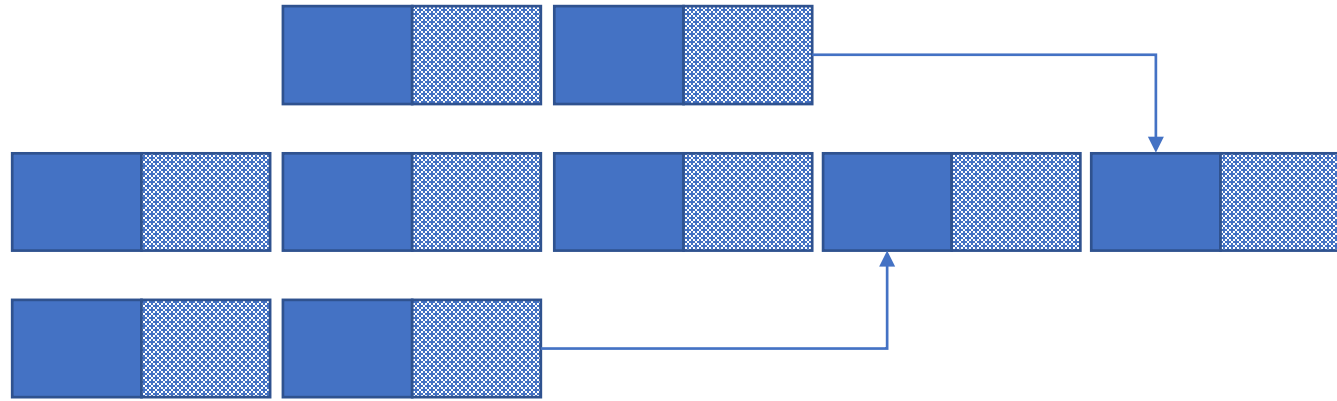
Highly  
Probable



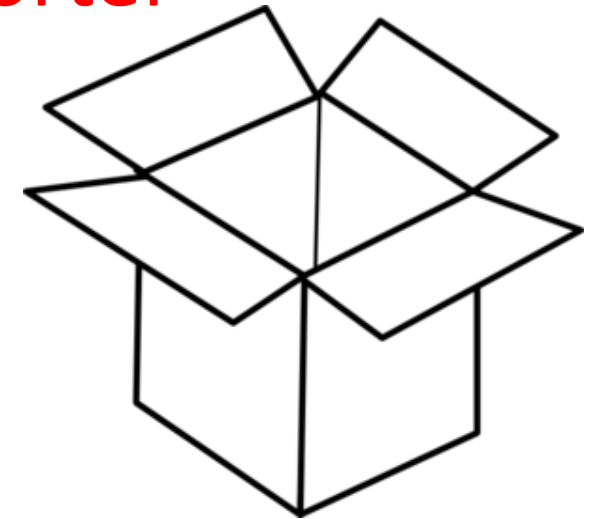
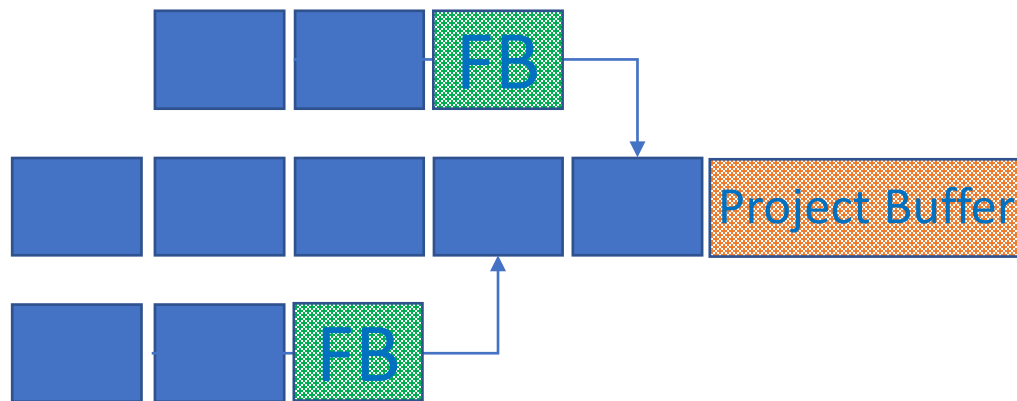




# BUFFERS: Shared Safety



Typically 25% shorter



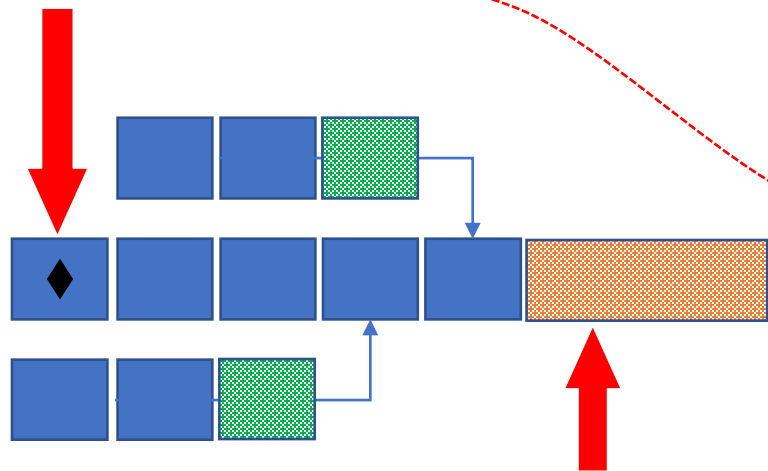
# Surely that can't be it?

- All you have done is shuffled some numbers about
  - Same people. Same stuff to do
- Of course not! A buffered plan gives us:
  - A shorter, achievable duration
  - New tools that facilitate better execution control
    - Work priorities
    - Early Warning
- They facilitate and support the project work flow behaviours.
  - “Focus & Finish”
  - Remove waste and improve flow

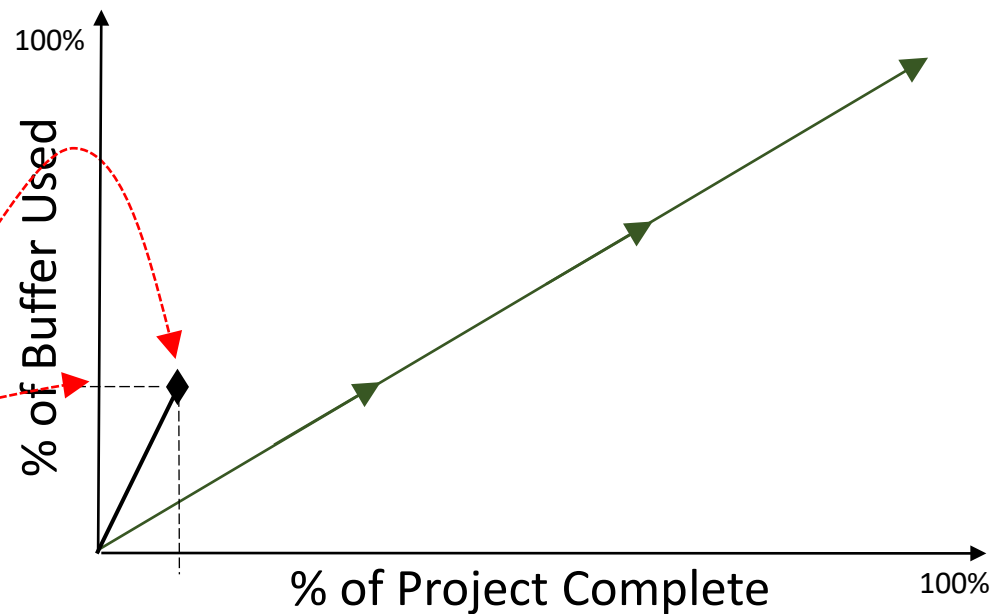


# Buffer Management

10% CC Progress



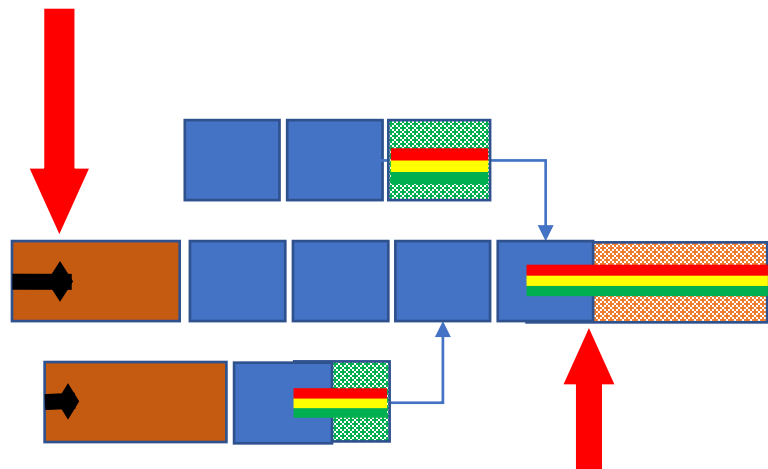
30% Buffer Used





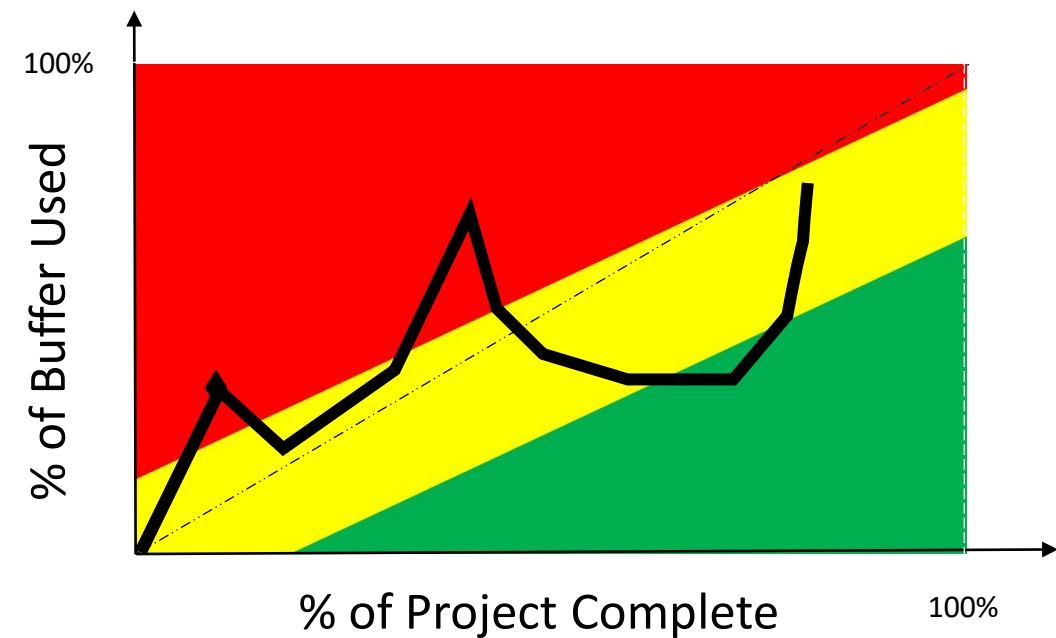
# Buffer Management

10% CC Progress

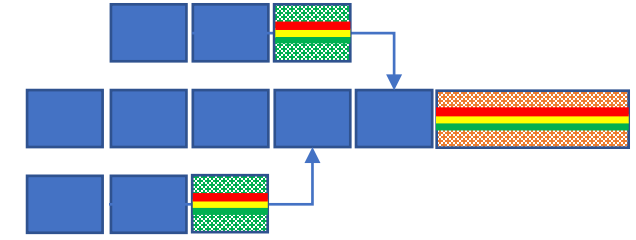


30% Buffer Used

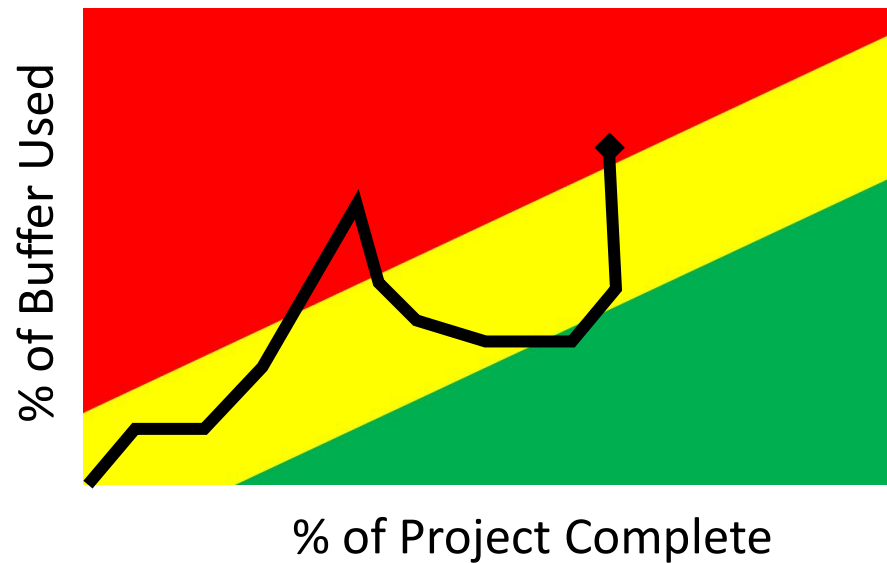
The Critical Chain Fever Chart



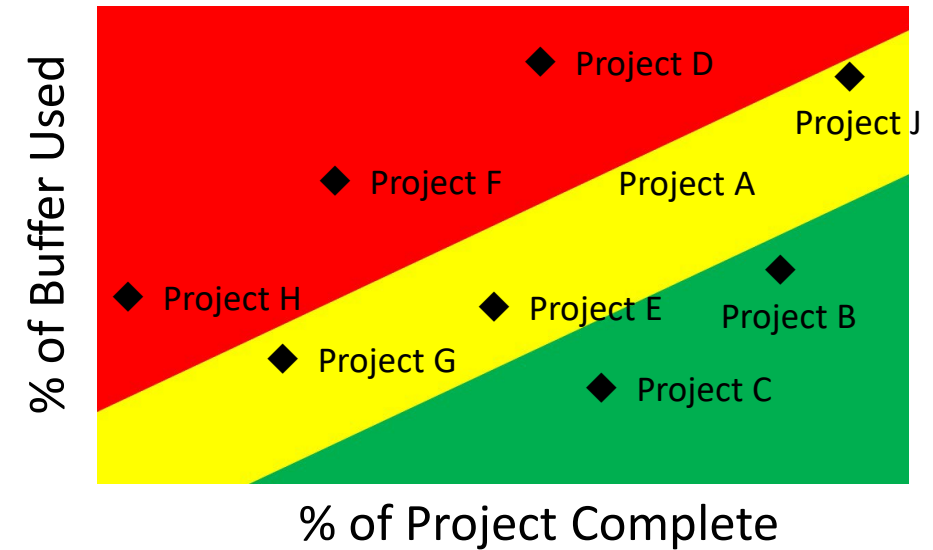
# Buffer Management



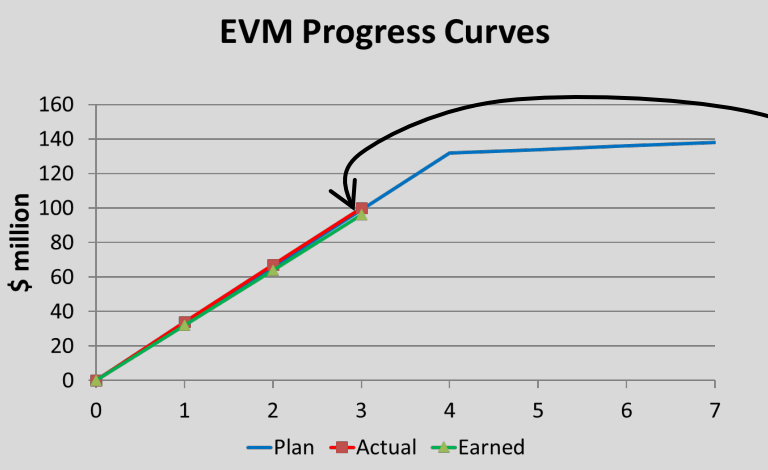
## Project Fever Chart



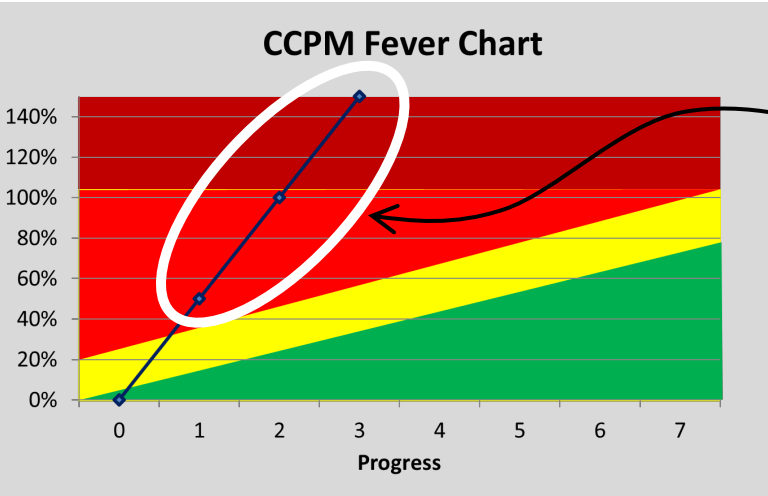
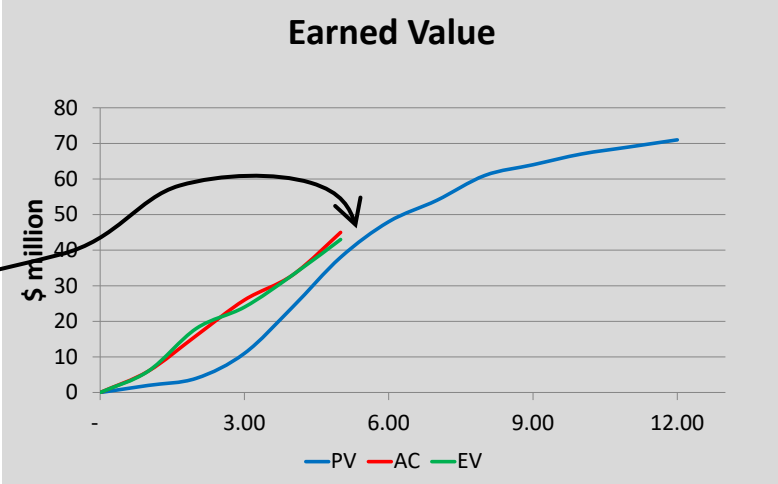
## Portfolio Fever Chart



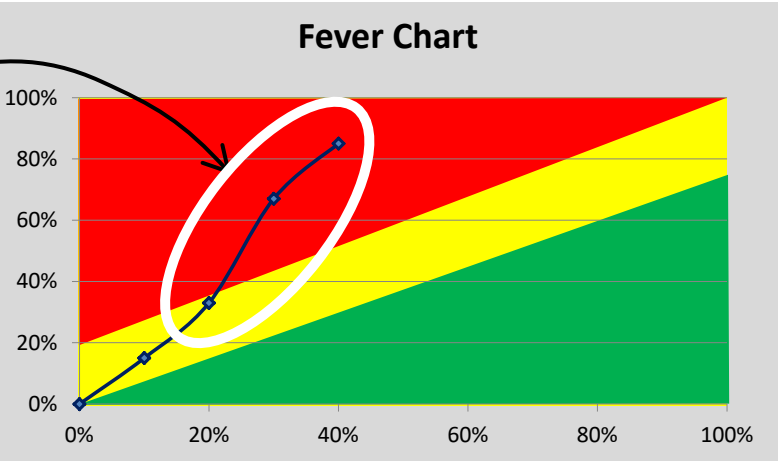
# Additional early-warning



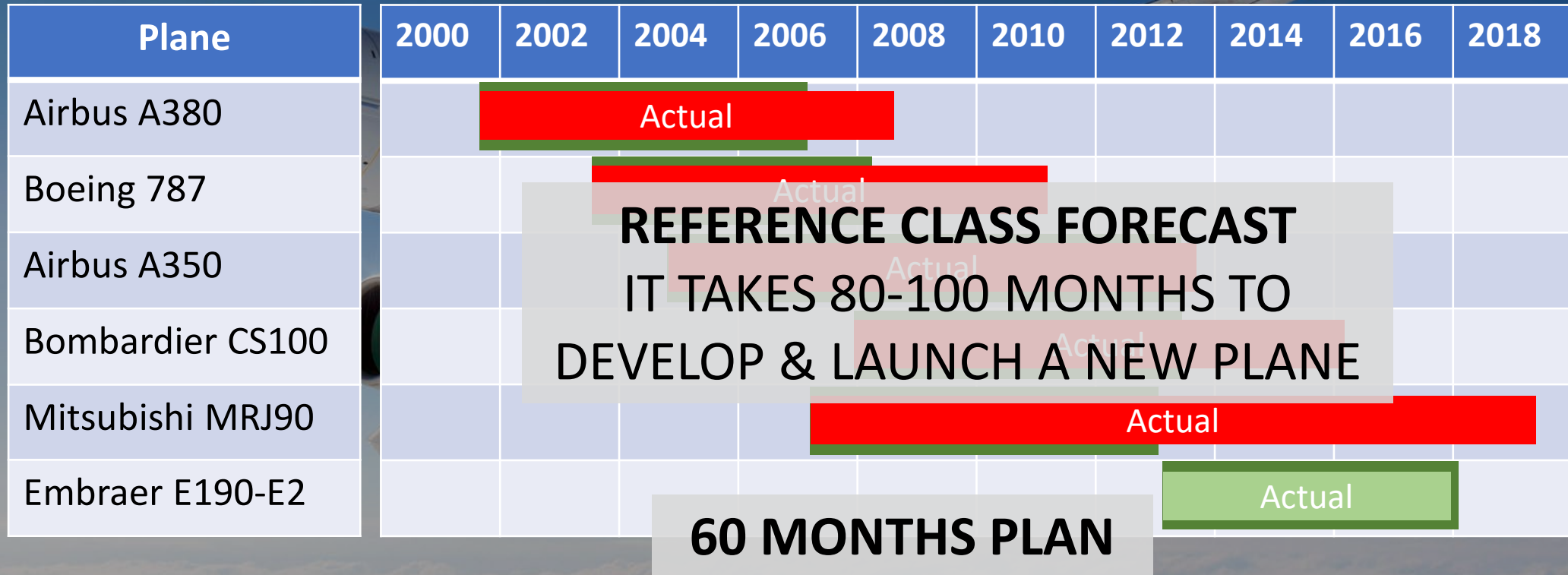
All is going well



Maybe not...







# BAE Systems and Critical Chain

**BAE SYSTEMS**

- Local success in the past
- Global piloting 2020 of CC
- Today over 12 major programmes using CC
- Sponsorship of the APM Guide to Critical Chain



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# Critical Chain

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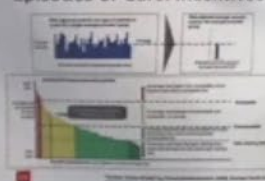


Children's Hospital of Erlanger is the only Level IV NICU within a 50,000 square mile area of Chattanooga. The demand for service has increased significantly over two years, and the unpredictable patterns of NICU admissions has stretched our bed capacity and nursing resources. Children's Hospital anticipates NICU reimbursement methodologies will shift financial risk to the hospital, as more emphasis is placed on LOS.

#### Background

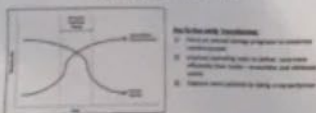
- ADC of 103% [Low 86% : High 114%], expanded NICU to PICU and post partum nursery.
- Inconsistent discharge patterns among attending Neonatologists.
- Increased scrutiny on NICU costs and LOS.
- 2nd wave TAG (Overall NICU expenditures in TN).
- Nursing shortage, use of travelers & increase premium pay.
- Limited collaboration between Maternal Fetal Medicine and Neonatology.

#### Episodes of Care: Incentives



#### Transitioning from Fee-for-Service to Value-Based Reimbursements

Providers will report quality metrics to prove patient quality and outcomes. Outcomes are being met while cutting costs - quality metrics will be tied to performance incentives.



#### Objective

To develop a forward looking, collaborative care planning tool for resource planning and length of stay management to optimize patient flow, nursing resources and bed availability.

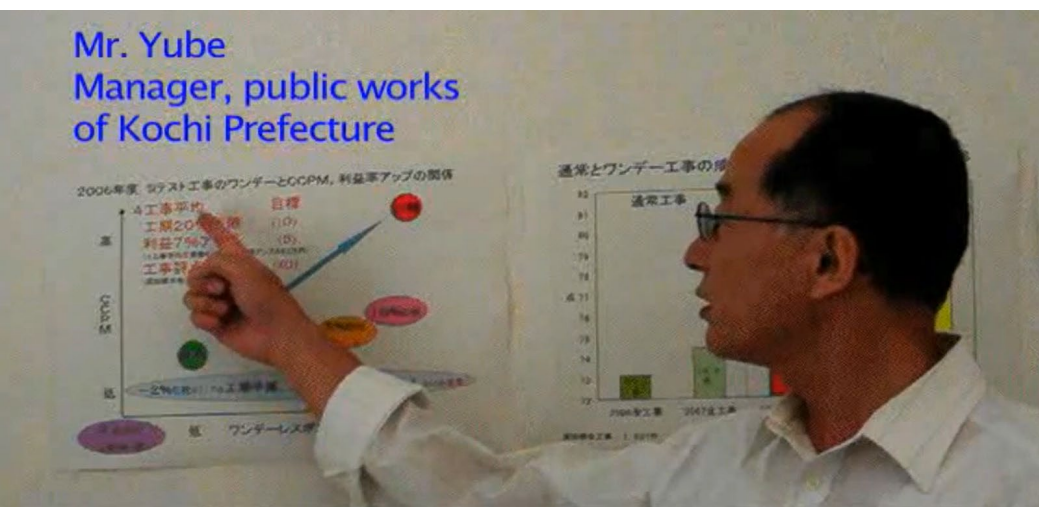
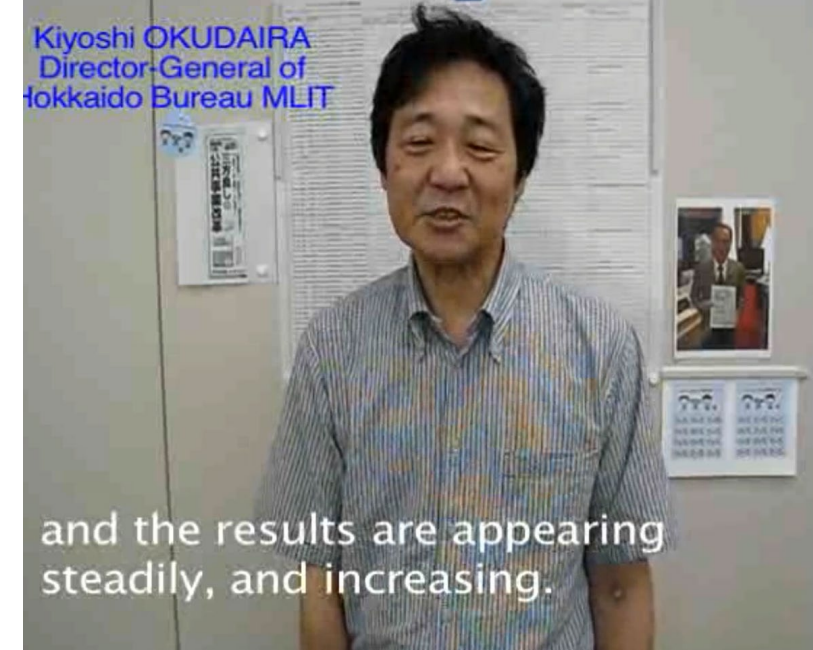
# Transformational Forward Looking Methodology for Neonatal Intensive Care Unit

Kathy Kohl, RN, MHA | Tyler Shugarts, MBA | Don Mueller, CEO, FACHE  
Bill Taylor | Danny Walsh | Michael Harris, MD

#### Predictive Model for NICU LOS

Months of Observation	NICU Stay	Estimated Post- & Refill Stay
23	103	114
24	104	115
25	105	116
26	106	117
27	107	118
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These are the results of the 5 test sites in Kochi  
Prefecture in 2006









“Critical chain gives us commercial advantage in ... project management. We are more-and-more committed to using it in all our project management applications.”

Mauricio Martins de Almeida Filho – Engineering VP, Commercial Aviation



Schedule Management LL – TC (Moog)

