



OFFICE OF  
THE PARLIAMENTARY BUDGET OFFICER

BUREAU DU  
DIRECTEUR PARLEMENTAIRE DU BUDGET

## Design-to-Cost: Misunderstood and misapplied

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### What happens when the project budget is too small?

- And the government is trying to balance its budget?
- “National Defence is confident the program will deliver what the navy needs, and a spokeswoman noted that the navy planners are currently engaged in a **"design-to-cost"** analysis.”
- “Overall, the main criteria will be to optimize the combat capability within the **design to cost** framework.”

## Objectives

- In this presentation:
  - we discuss the history and methodology of design-to cost
  - we dispute the notion that design-to-cost can serve as a panacea for all projects
  - we present conditions for the successful implementation of a design-to-cost approach
  - we discuss the implications for DND and cost estimators

## Obvious question: Why DTC and not CAIV?

- We don't know for sure, but we have two hypotheses:
  1. Colour of Money Problem (i.e., Votes)

The source of funds for the acquisition differs from that of the operations and maintenance. Therefore, focus of the program office is on completing the acquisition.
  2. Meaning vs. Buzzwords

Perhaps cynical, but it is easier to say that we are using design-to-cost than admitting that we are cutting capabilities.

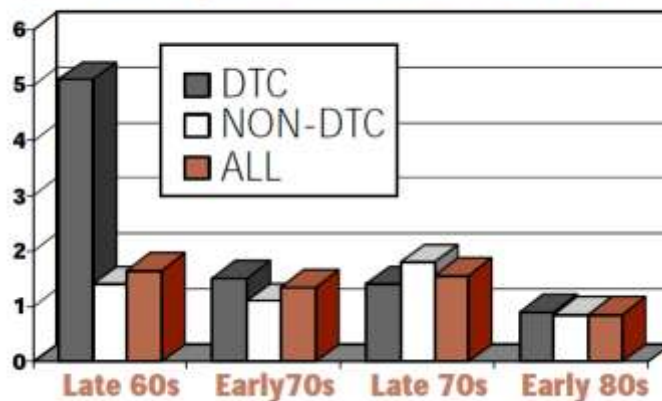
## What is DTC?

- According to the *Design to Cost Handbook* (DoD 1990):
  - “managerial technique for controlling cost by “designing to specific goals.””
  - intended to encourage creativity in the design process
- According to Report of the Task Force on Reducing Costs of Defense Systems Acquisitions (DoD 1973)
  - DTC is a way of doing business, not another tool for the tool box
- What is happening at DND is a cost-cutting activity, not true DTC

## Is design to cost more cost efficient than other techniques?

Not necessarily...

Figure 1. Total Program Cost Growth—DTC vs. Non-DTC



## Why did so many DTC programs fail to see cost benefits?

- According to Kausal (1996) DoD overused the technique
- Looking at the use of DTC in the early days:
  - Applied to all major programs
  - Became part of contracting process (bureaucratic) rather than design oriented
  - Impossible to negotiate realistic targets on sole-source contracts
  - No central guidelines → reinvented the wheel with each program
  - Most contractors didn't have DTC processes

## So, when has DTC been successful?

**Project controls: Cost/schedule/progress management of the NASA Wind Tunnel restoration project**

Yu, Kelvin

*Cost Engineering*; Apr 1996; 38, 4; ProQuest Central

**Aerospace Construction Cost Estimating**

Brown, Joseph A

*American Association of Cost Engineers. Transactions of the American Association of Cost Engineers*; 1992; 2,

ProQuest Central

**An Aerospace Component Cost Modelling Study for Value Driven Design**

J.M.W Cheung, J.P Scanlan, S.S Wiseall

*CIRP IPS2 Conference 2009*

**A case study on TATA NANO**

Vikas Minhas

**Saving an Estimated \$1.2 Billion with a Design-to-Cost Methodology**

Raytheon Systems

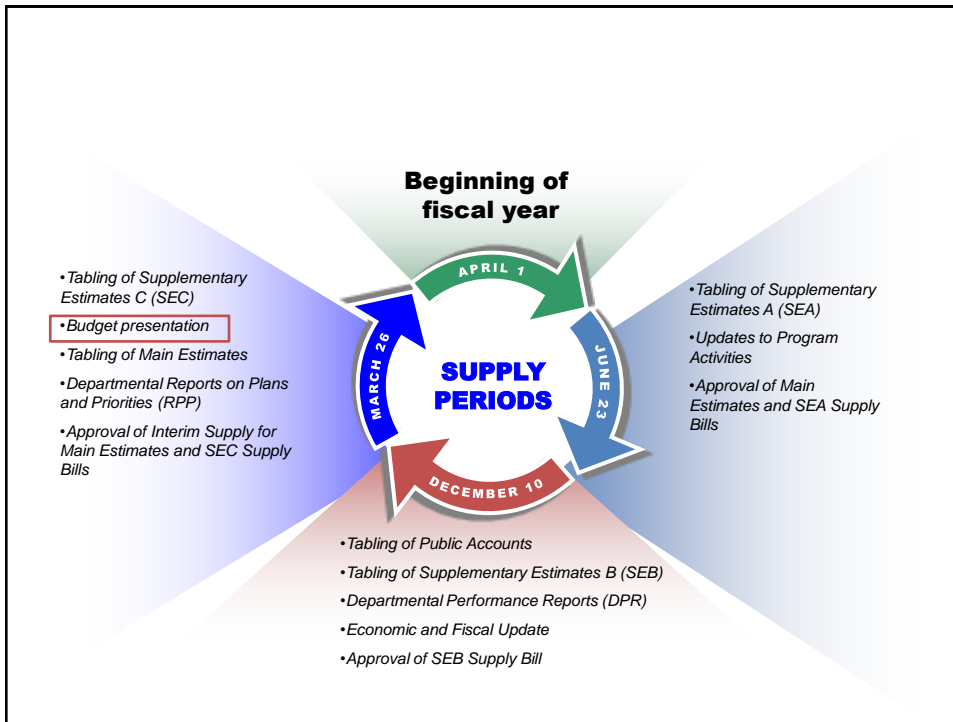
What do these successes have in common?

Project	For profit enterprise
NASA	
Rolls Royce	✓
TATA	✓
Raytheon	✓
Loral Electronic Systems	✓

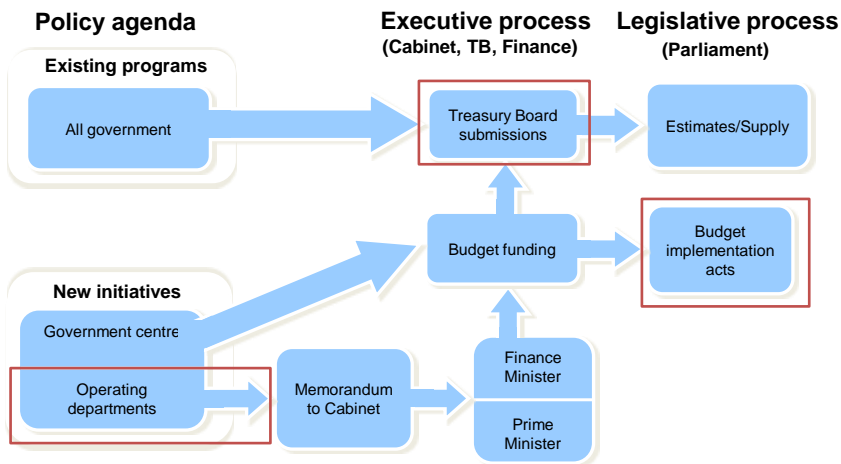
Is DTC the cure for the department's project woes?

- There are two barriers to implementing DTC at DND:
  - Government processes
  - Budget allocation practices

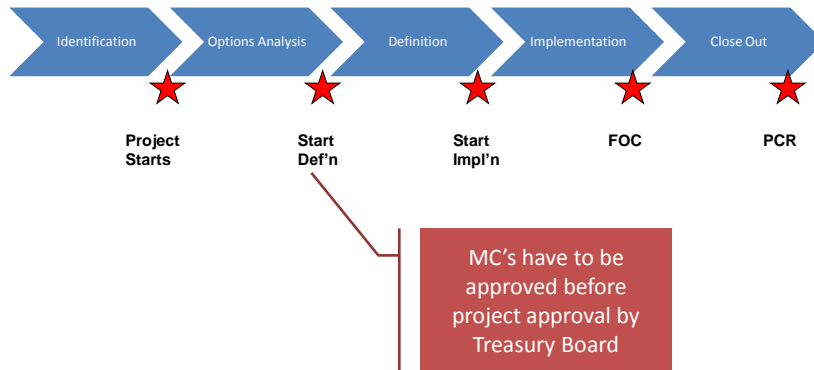
## EV-6 - Design to Cost: Misunderstood and Misapplied



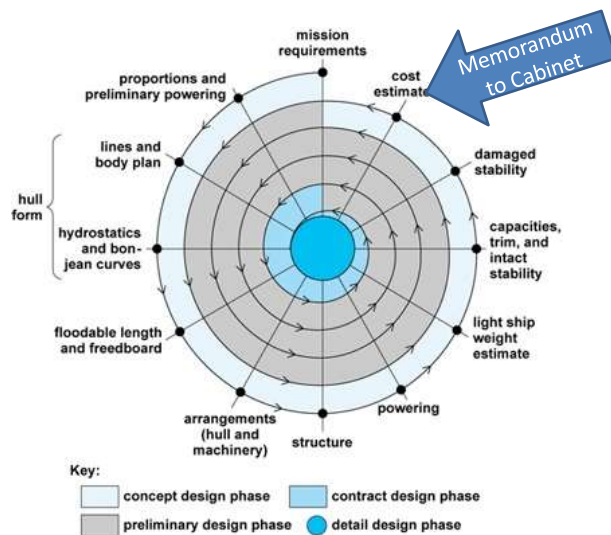
The system that exists makes it tricky to implement DTC

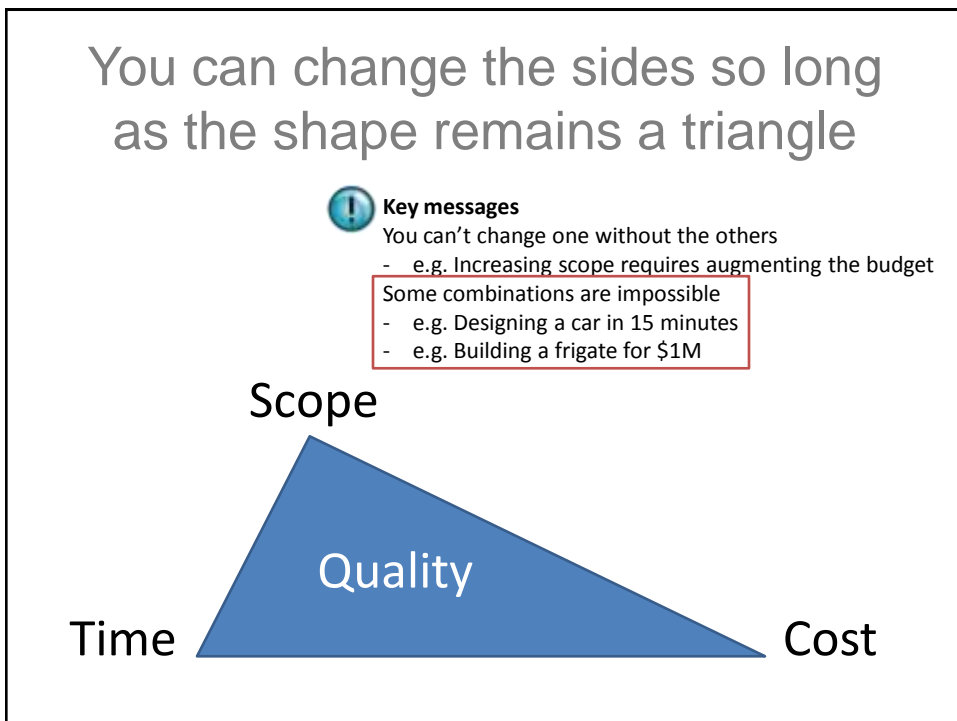
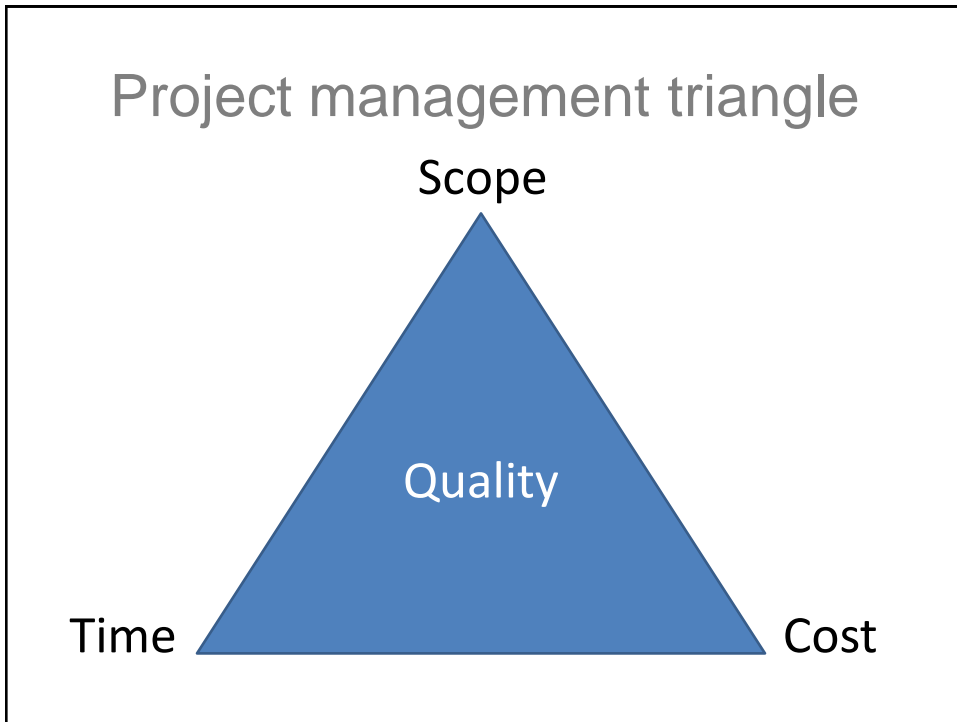


## At the department level...



## So when should the department get their MC approved?







## Summary in three questions

1. What is design-to-cost (DTC)?
  - A way of doing business
2. When should we apply this approach?
  - From the very beginning
3. Is this the cure for the department's project woes?
  - Probably not.

## Implications

- Objective: to avoid “sausage making”
- Ideally: Cost estimators must be engaged earlier in the approval process
- Realistically: Need to create simple models, tests of reasonableness that can be used by policy wonks

**THANK YOU**