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The Project Manager, Systems Engineer, and the Conflict over Project Resources

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It's all about hidden reserves.
Study all about them.
Benefit.

The Mission of a Project Team is Deliver

The Specified System

Performance, Reliability, Quality, Cost…

Within Allocated Schedule

And Allocated Budget

Comply with Customer needs and Performing Organization goals

Responsibility and Authority

Systems engineers focus on:
System characteristics
Their interest is:
To invest time and money as much as needed

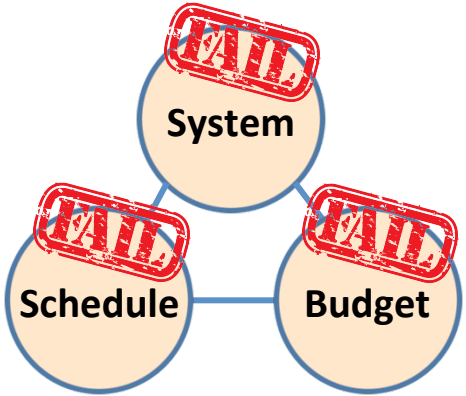
Project Managers focus on:
System, Schedule and Budget
They have a further interest:
Limit time and money expended

This creates a conflict over project resources

Unresolved Conflicts Hurt Performance

In many cases:
Sub-optimal project performance

In extreme cases:
a failure in all three aspects of project goals



Rate of project success (in all three aspects) is lower than acceptable

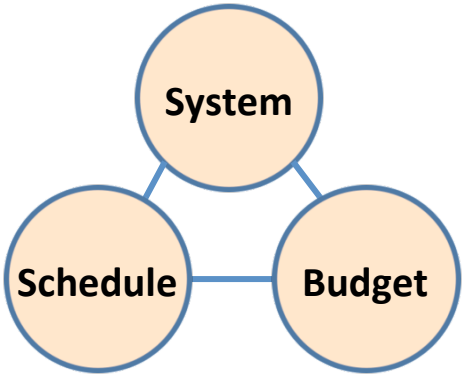
The Conflict is Enhanced by:

- The golden triangle characteristics

- Uncertainties

- Reports on failure to meet project objectives (i.e. the Standish Group Report)

The Golden Triangle



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- More system features shall **always** require more time and/or budget
- Schedule shortening shall **always** entail less features and/or more budget
- Budget cuts shall **always** entail less features and/or cause schedule slips

**"I should fight my colleague in order to defend my interests…
If he wins I will lose"**

Uncertainties

System related uncertainties (i.e. performance)
Schedule uncertainties
Budget uncertainties

Uncertainties invite pressure

Pressure is the Enemy of Balance

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Example:
Stakeholder's pressure directs the project team to stay on the safe side, avoid risk

early decisions (before data is available)
conservative choices (not necessarily the right ones)
innovation avoidance (abandon great potential)

Published Research: Most projects fail to meet at least one of their success goals.

Academia response:

WOW! Great research opportunities!

Project team (project managers, systems engineers) response:

"I may relax now, I am in a good company…"

Lots of failure reports subconsciously do legitimate partial success

We should look for resolution

Act both in cognitive and practical domains

Convert the easy (or hysteric) atmosphere with a calm but challenging one

We need better tools to help address the conflict

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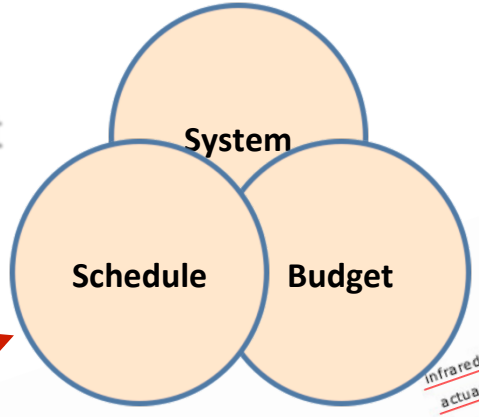
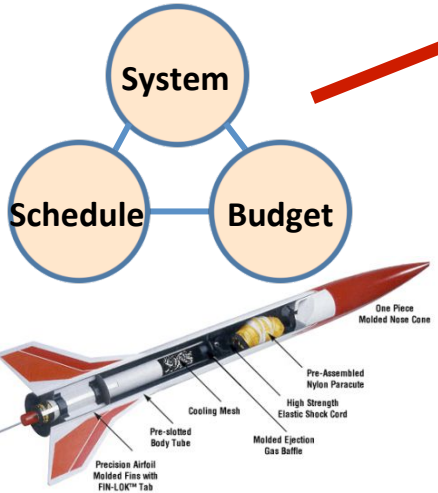
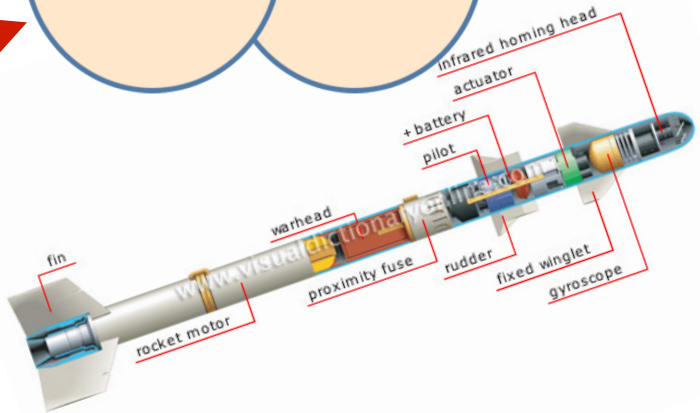
The golden triangle – a typical behavior

Increased scope of system necessitates
an increase in both schedule and budget







Uncertainties affect the golden triangle…

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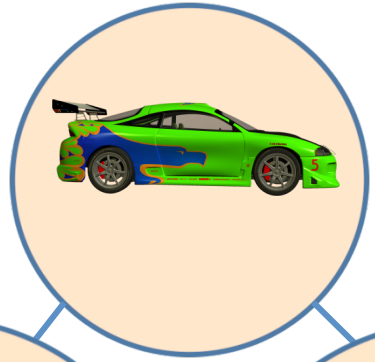

Planning the development of a car (the system)

Schedule

Budget

Uncertainties encourage "rich", safe planning

…"Rich" planning breaks some rules

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Powered by uncertainties, "rich" planning creates schedule and budget reserves

The golden triangle behavior can deviate from classics

Teams need tools and a challenging atmosphere in order to exploit the reserves created

Cross interrogating the “rich planning” idea

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1. How does the “richness” thesis align with reports on failures to meet all project goals?
   Bad managerial decisions “bite” those reserves and final project achievements.
2. Why do we get “rich” planning at all?
   Convenience. Mutual interest of all stakeholders to have reserves in plans. None of them likes to fail.
3. And what happens when planning is “poorly” resourced?
   Back to classics. Results shall be dominated by the classical golden triangle behavior.

The Mission

- Find hidden reserves
- Exploit those reserves to the benefit of project success

The Time Management – Process and Tools

The time management process = Plan + Control
Plan = Create a project Logical Plan
Control = Follow execution and re-plan

A very efficient tool available to the project time and budget manager is the buffer(*)

(*) Dr. Eliyahu Goldratt, the Theory of Constraints (TOC)

Introducing a project buffer into plans

- A single project buffer is introduced into plans of schedule and budget

- We would like to use this buffer to “pump” reserves out of “rich” tasks and reallocate them to tasks in need

How do we “pump-out” the reserves?

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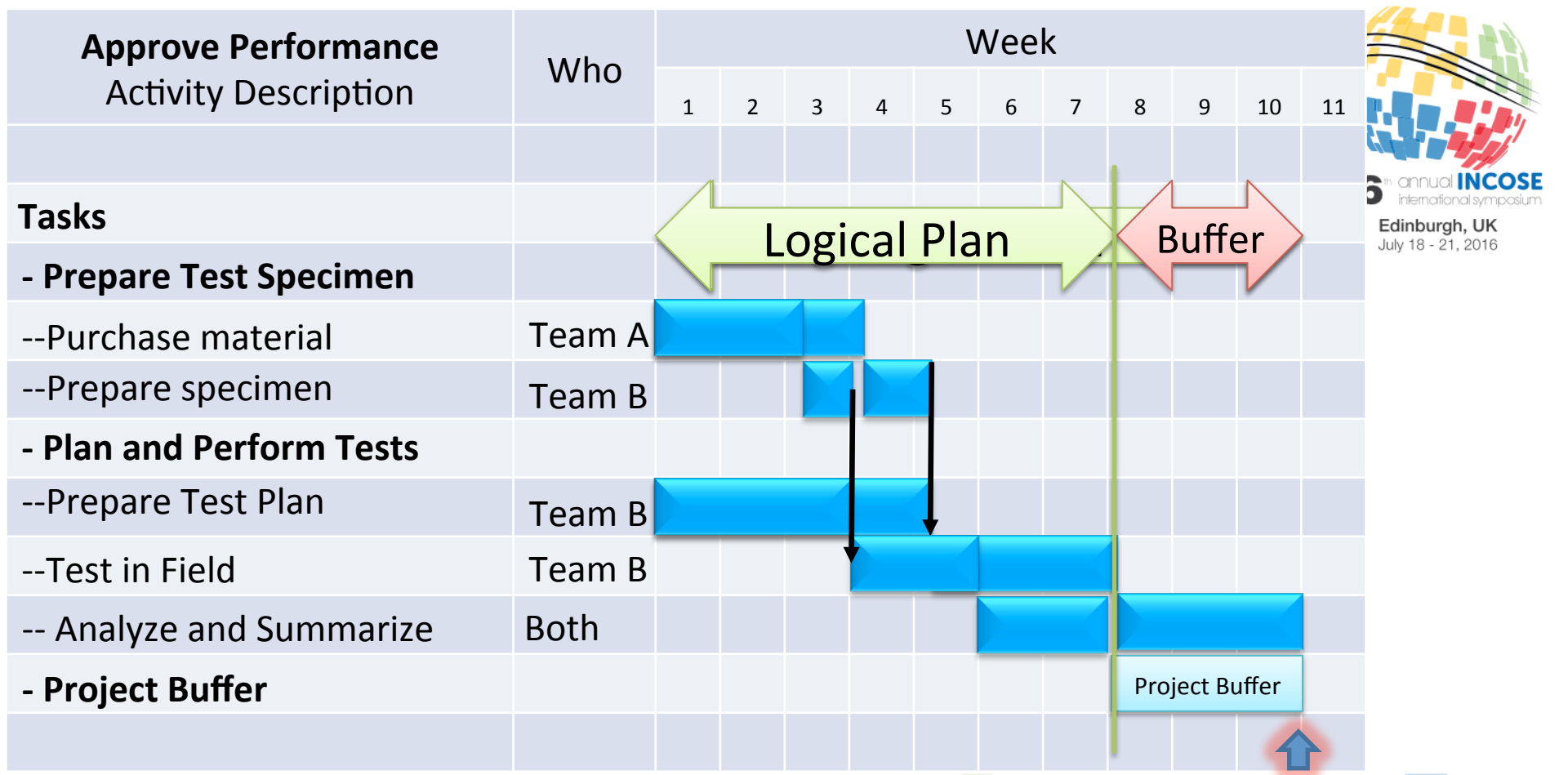
Our agent is the project buffer:

- It decreases time allocation for each of the tasks
- It creates artificial, yet challenging, resource shortage
- It directs team to deepen knowledge of plan details and reveal reserves



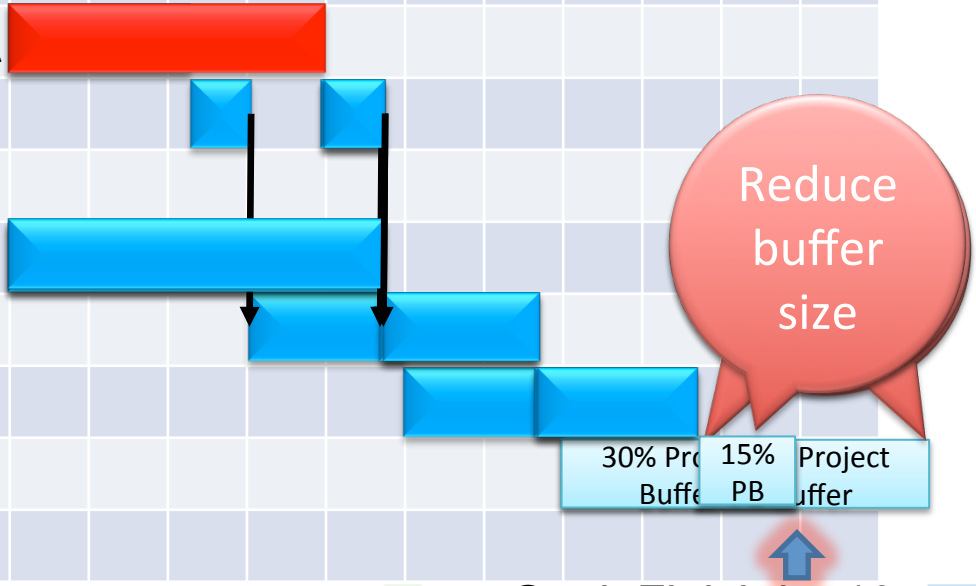
A large buffer early in project life cycle:

- Increases challenge
- Enables early warning and resolution of unexpected needs

Time buffer management

- Ineffective reactions to delays:
  - Allow project schedule slip
  - Consume buffer and react
  - Reduce buffer size

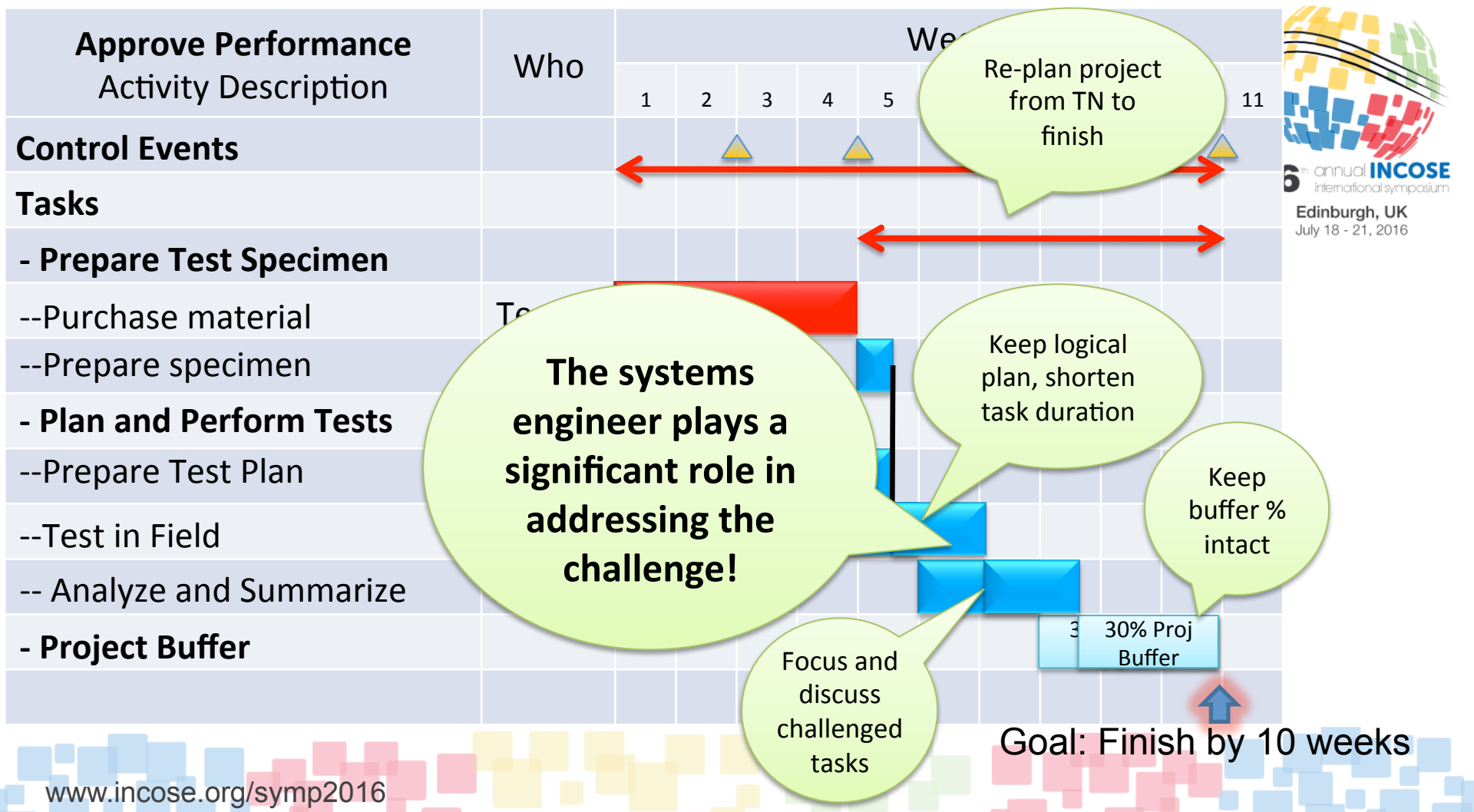
Approve Performance Activity Description	Who	Week 1	2	3	4	5	6	7	8	9	10	11
Tasks												
- Prepare Test Specimen												
--Purchase material	Team A											
--Prepare specimen	Team B											
- Plan and Perform Tests												
--Prepare Test Plan	Team B											
--Test in Field	Team B											
-- Analyze and Summarize	Both											
- Project Buffer												



Goal: Finish by 10 weeks

Time buffer management

- Ineffective reactions to delays:
  - Allow project schedule slip
  - Consume buffer and react
  - Reduce buffer size
- Effective reaction:
  - Stick to project schedule (finish date)
  - Keep buffer size fixed in terms of percentage out of the time left till project scheduled finish
  - Focus on and discuss resolution to challenged tasks


Approve Performance
Activity Description
Who
We
1
2
3
4
5
11
Control Events
Tasks
- Prepare Test Specimen
--Purchase material
--Prepare specimen
- Plan and Perform Tests
--Prepare Test Plan
--Test in Field
-- Analyze and Summarize
- Project Buffer
Re-plan project from TN to finish
The systems engineer plays a significant role in addressing the challenge!
Keep logical plan, shorten task duration
Keep buffer % intact
30% Proj Buffer
Focus and discuss challenged tasks
Goal: Finish by 10 weeks

Achieving Project Goals - Major Factors

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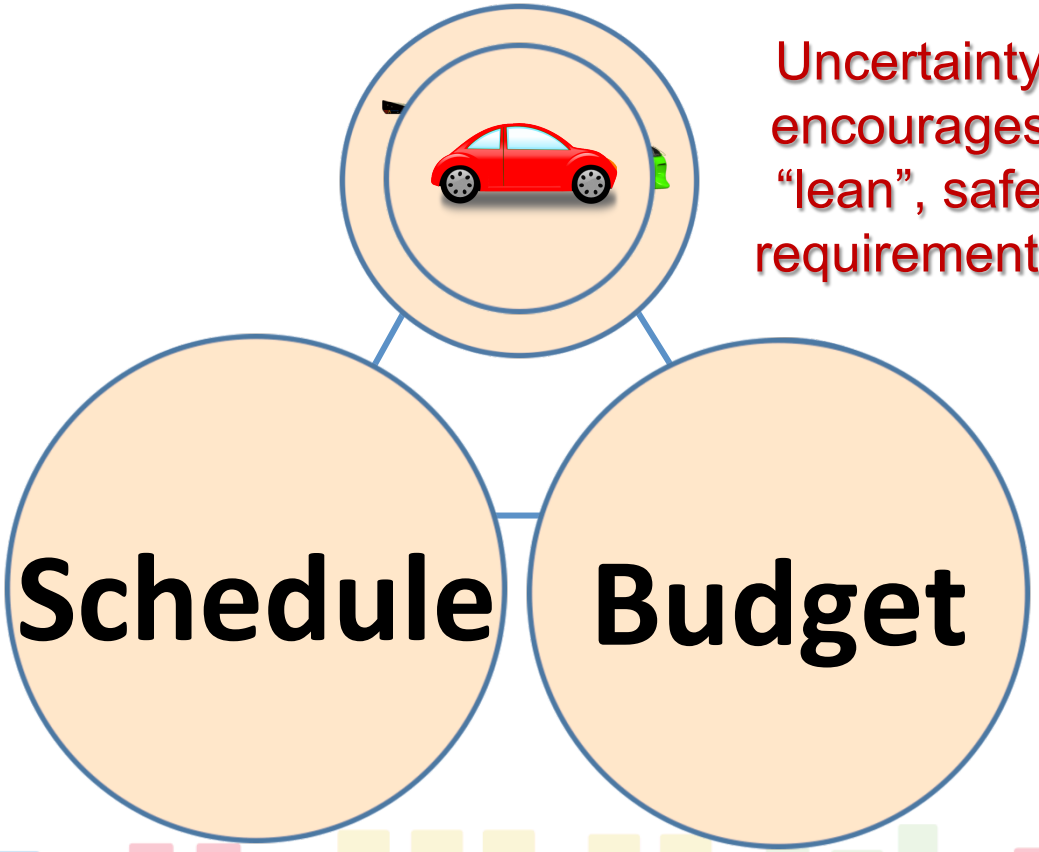
Introduce a buffer to project plans

- Introduce a significant buffer
- Use it to “pump” reserves out of plans
- Redistribute reserves to needy tasks during project execution

Re-plan project at control events

- Create control intervals
- Assess project execution up to the control point
- Make it a basis for project re-planning

Uncertainties affect system scope as well



Uncertainty encourages "lean", safe requirements

Uncertainties encourage "rich", safe planning

System Scope Management Process

Plan & Control
the conversion of requirements into a system

Uncertainty,
pushes project team towards a “realistic” requirement allocation

A “realistic” requirement allocation means “lean and safe”
Omits potential features and abilities of components
and on the other hand
Cannot guarantee ability to meet requirements

The requirements buffer concept

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Introduce a requirements buffer into plans

- Create a challenging allocation of requirements.
  Ask for more!
- Challenge all scope aspects:
  - Key performance parameters,
  - Physical properties (weight, volume, reaction time),
  - And production cost.

Use requirements buffer to reveal over-spec components and transfer it to under-spec components

Why should it work for us?

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- Creates a challenging (rather than intimidating) atmosphere
- Calls to deepen study of physical and technological limits
- Enables optimal design
- Encourages use of advanced and innovative technologies
- Pushes towards a thorough examination of pre-assumptions and changes the irrelevant ones

SUMMARY

It was all about hidden reserves in scope, schedule and budget.
Find and study those reserves.
Benefit.

Thank You