Effective Schedule and Cost Management As a Product Development Lead

Instructor: Cynthia Simmons, Code 550

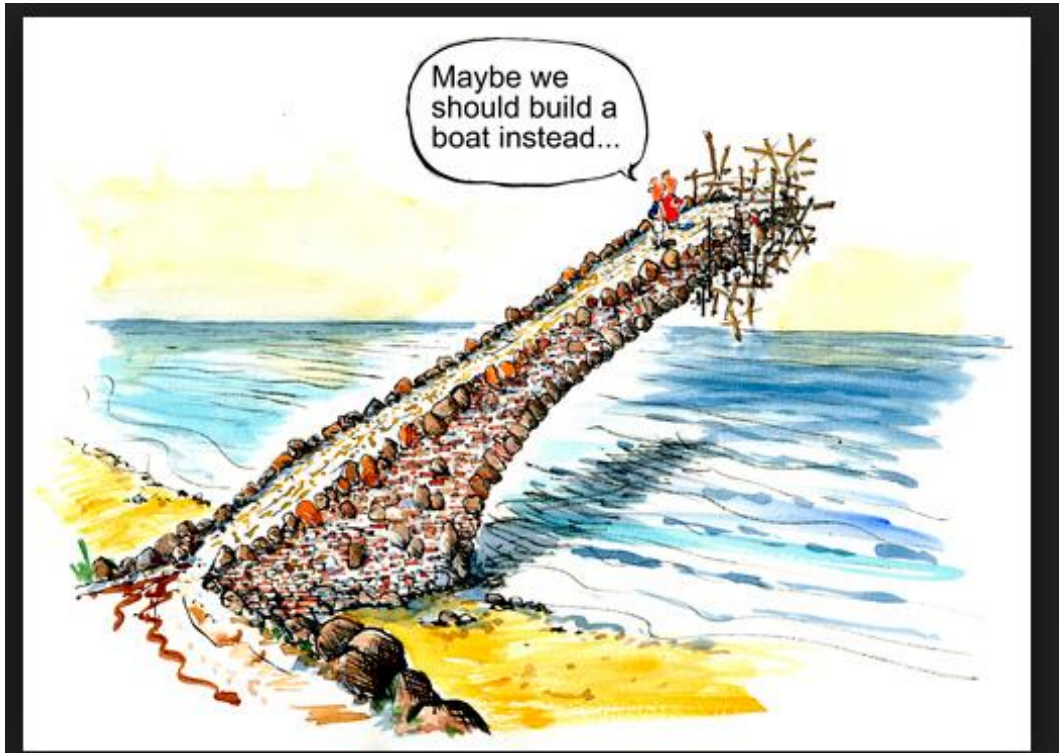
The PDL is ultimately responsible for successful execution of their product: on time, within cost, meeting all specifications with acceptable risks.

Source: GSFC Product Development Lead Training Program – Leadership

A Bridge Not Too Far?

We have learned how to do the job when everything goes right,

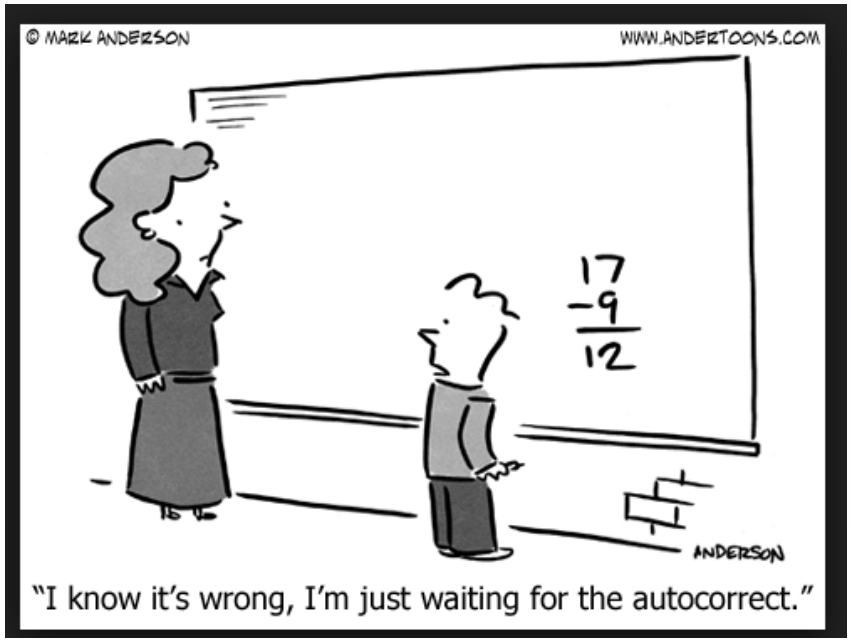
but…



Managing to Your Commitment

How do we ensure that everything will go as planned?

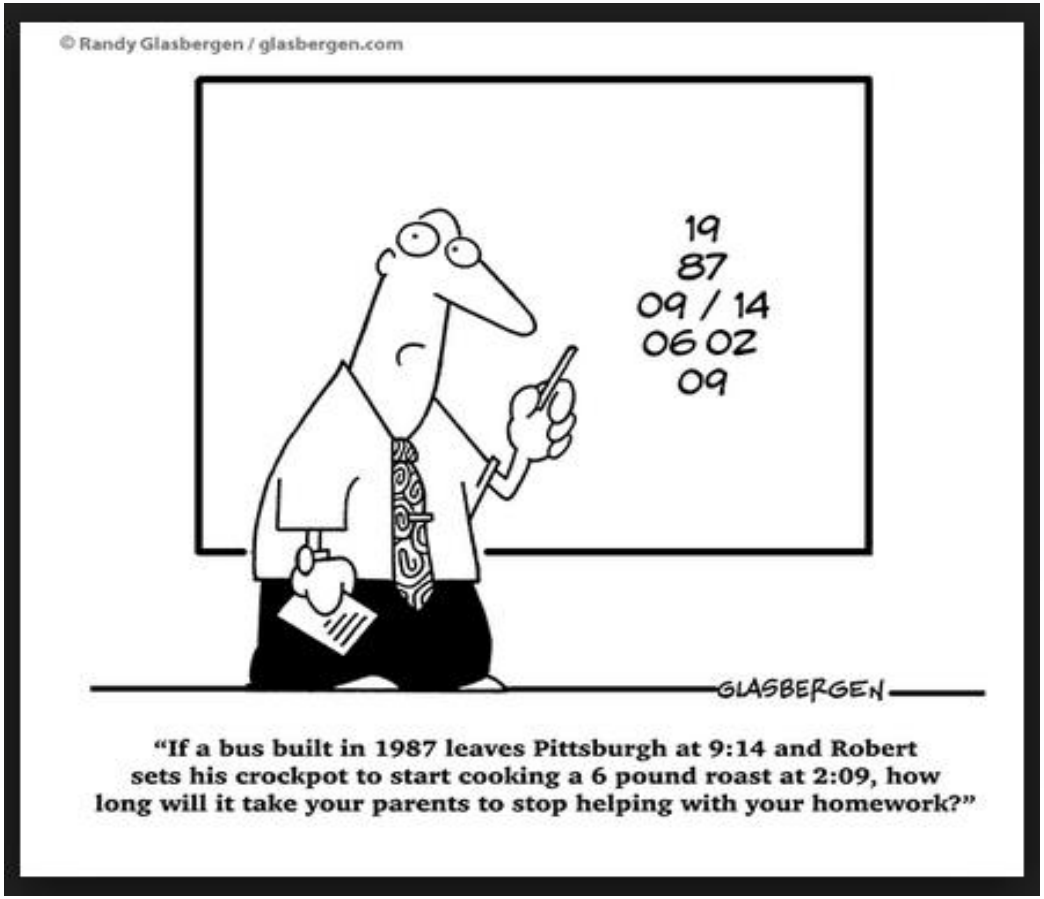
What do we do when something goes wrong?



SOME BASICS…

EFFECTIVE SCHEDULE AND COST MANAGEMENT

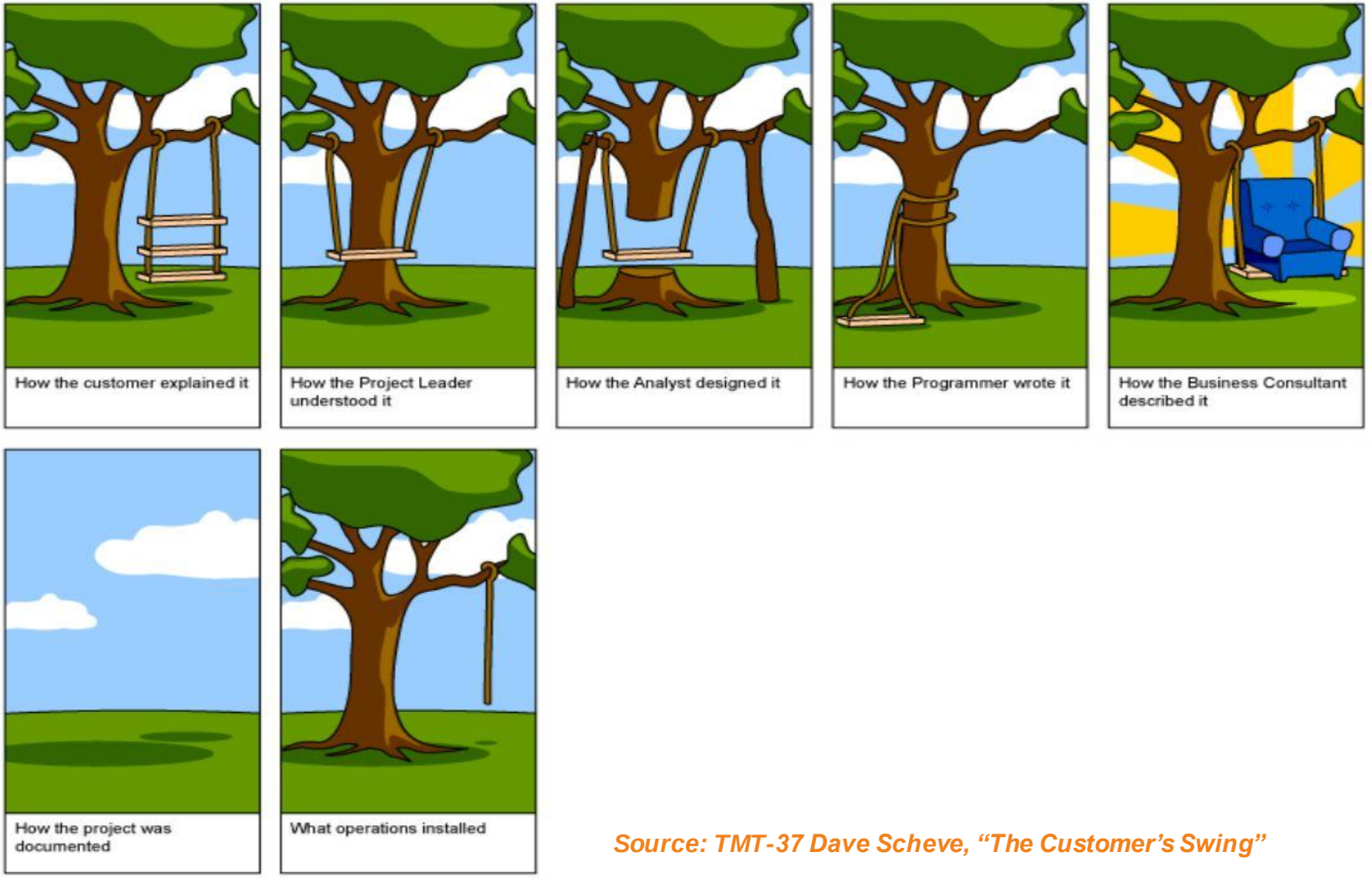
Do I Know What Problem I Am Solving…?



The Customer's Swing

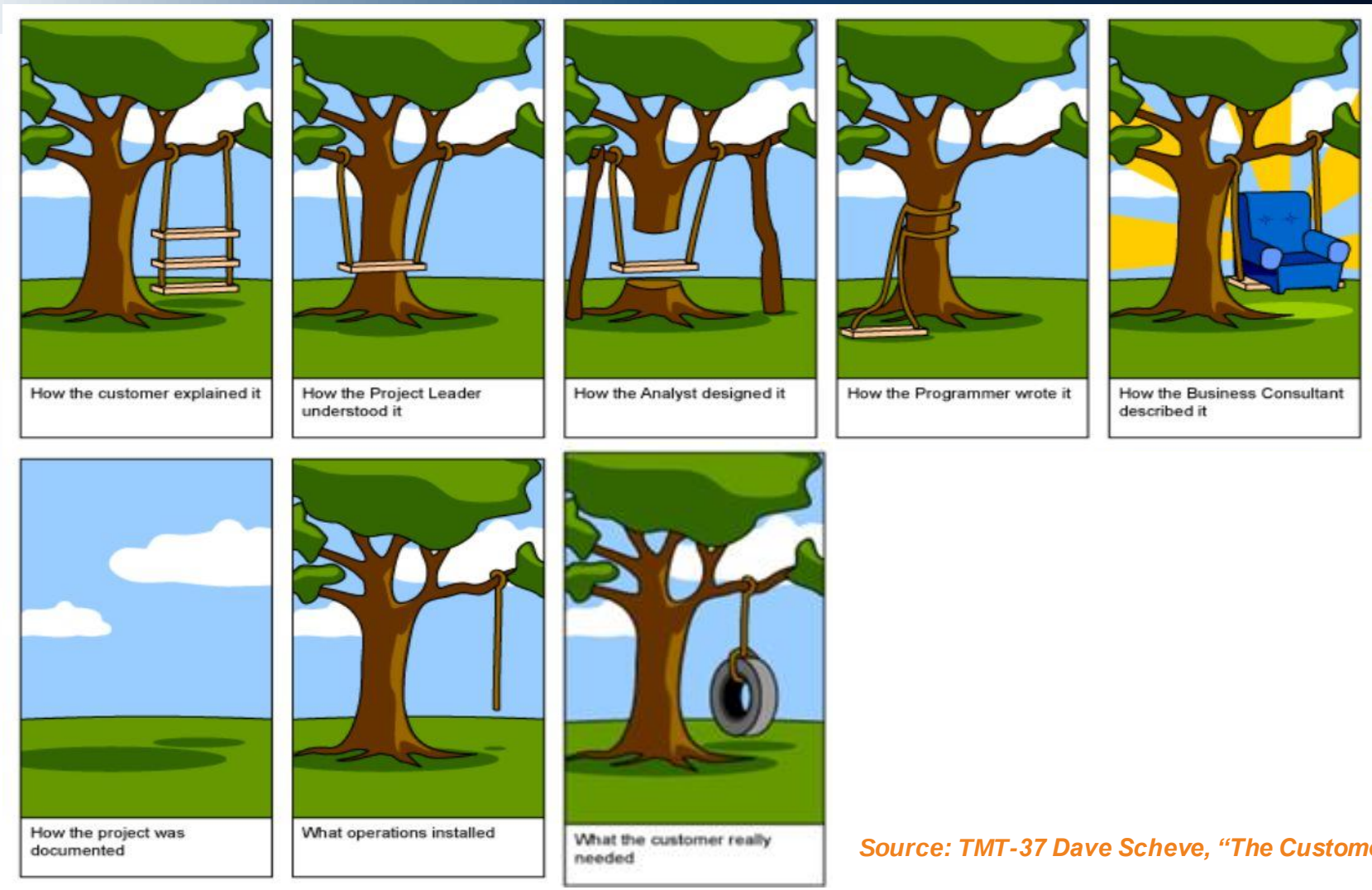
Source: TMT-37 Dave Scheve, "The Customer's Swing"

We Can Do It!



Source: TMT-37 Dave Scheve, "The Customer's Swing"

Isn't It Just a Matter of Semantics?

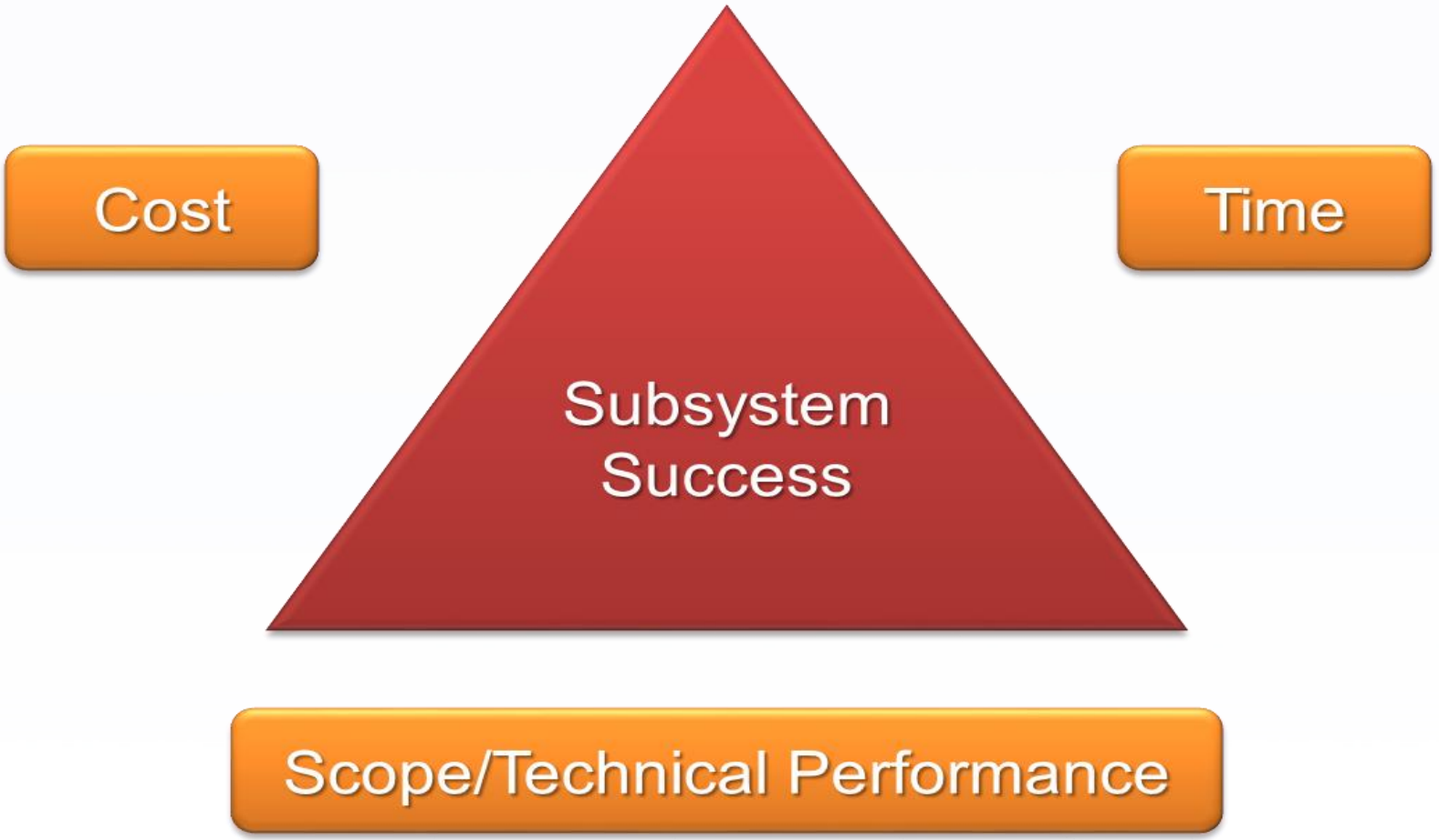


Source: TMT-37 Dave Scheve, "The Customer's Swing

Do I Know Who Knows What?

Source: GSFC Product Development Lead Training Program – Managing to Your Commitments

Which Is Most Important?



Source: GSFC Product Development Lead Training Program – Schedule Matters

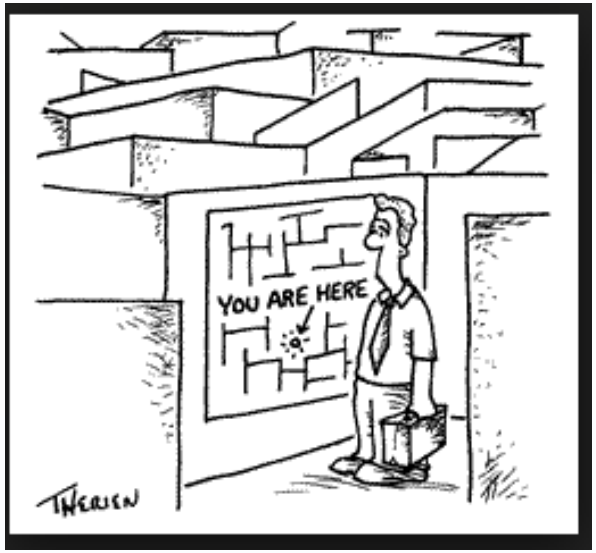
What Are The Risks?

Does the plan make sense?

Do I need to wait for somebody to do something?

What could reasonably go wrong?

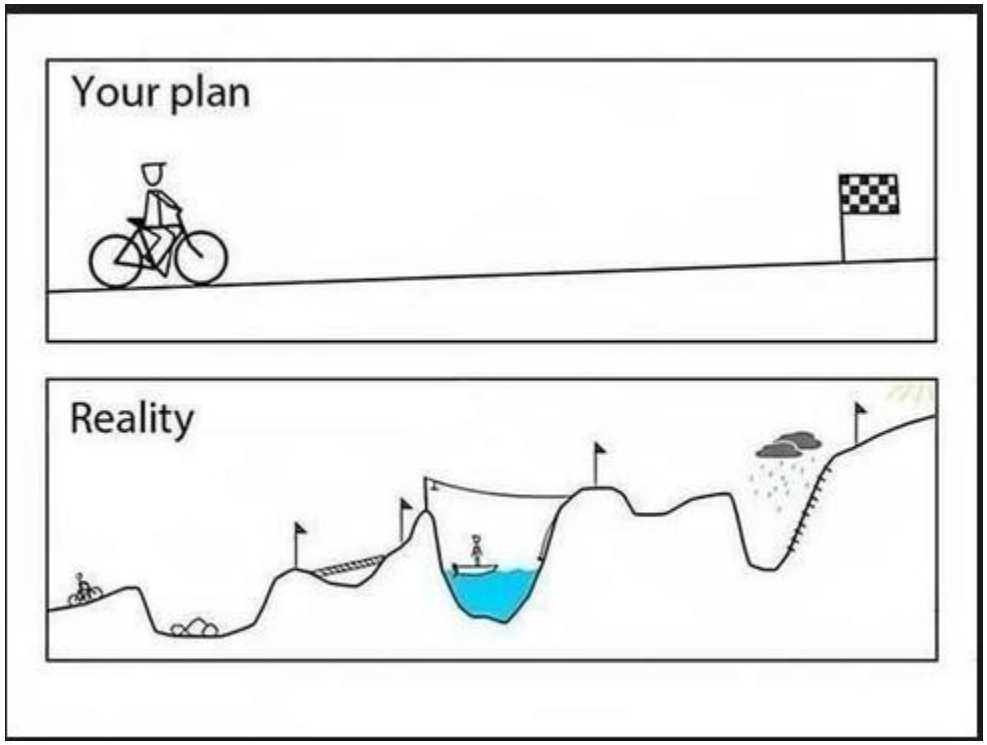
Is the plan a feasible path forward?



FIRST THINGS FIRST

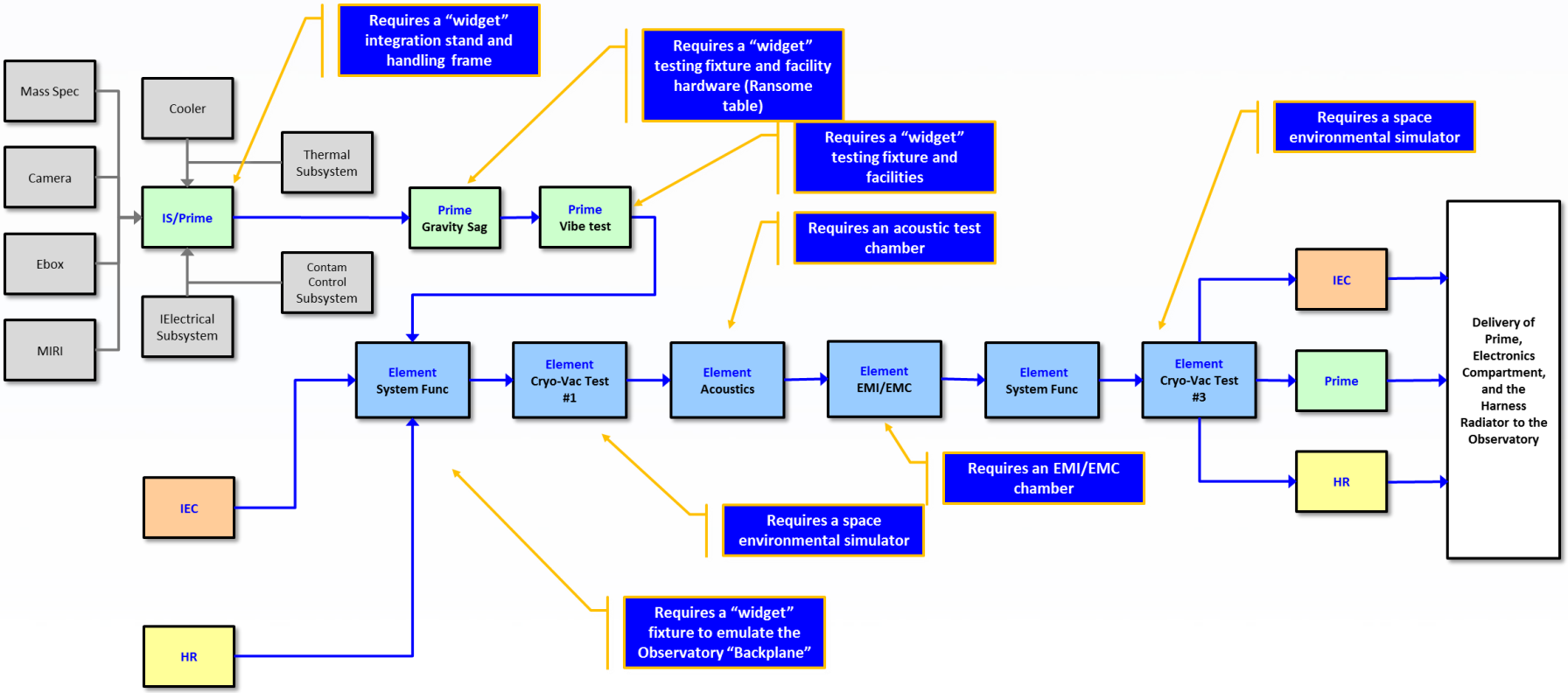
Develop a Credible Plan

Credible = Executable



Make an Executable Schedule

Map out what needs to be done



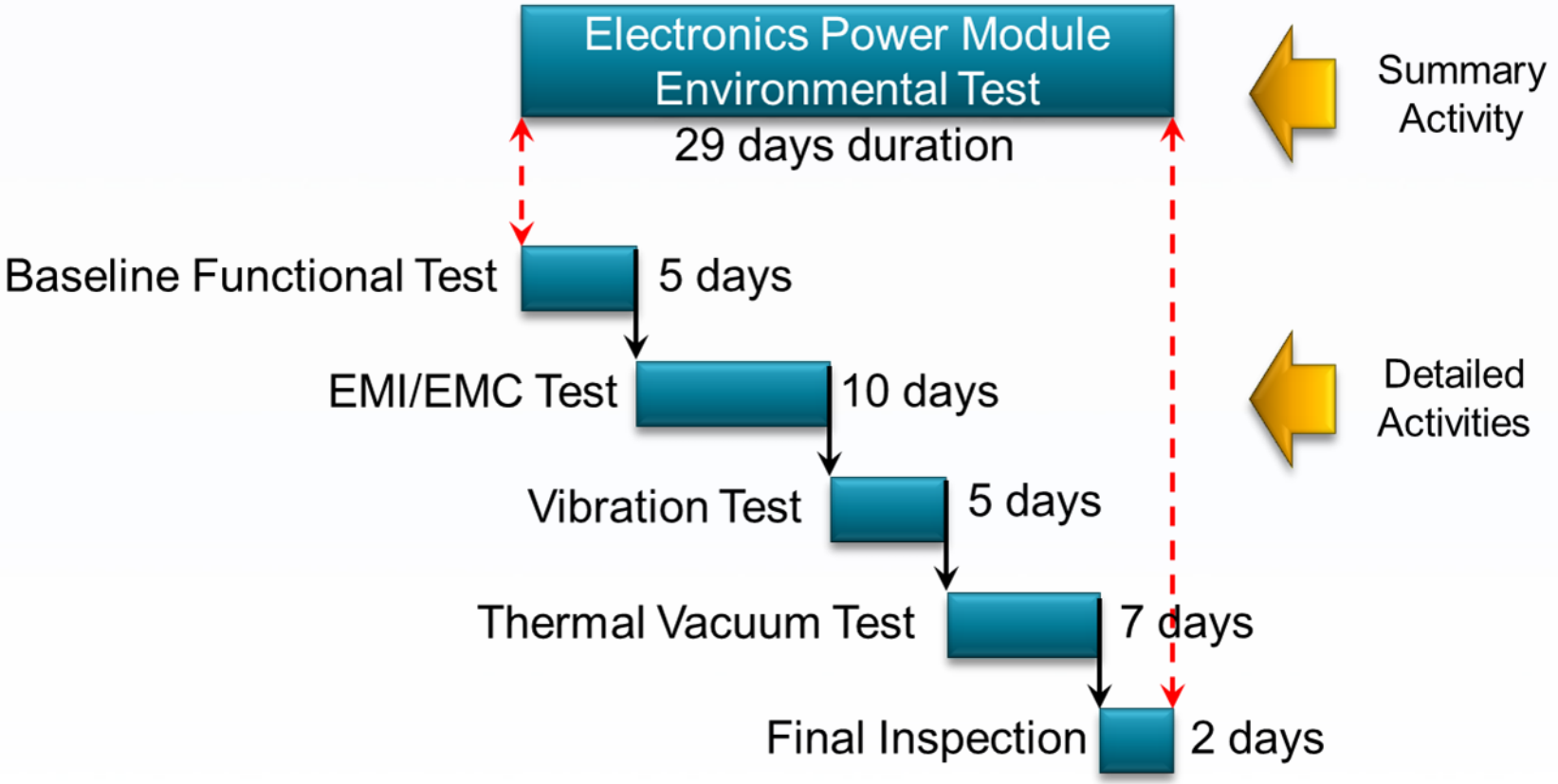
Make a List….Check It Twice

- Itemize activities and associated tasks
  - Capture critical information and risks for each task

	A	B	C	D	E	F	G	H	I	J
1										
2		SAMPLE								
3			*PDL Tool to assist with creating an executable schedule and budget plan*							
4										
5										
6										
7		**Event**	**Tasks needed to get done**	**Staffing skill set required**	**Key interim milestone**	**Duration**	**Facilities needed**			
8		Flight TVAC test								
9			design mounting plate	mid-level mech designer						
10			fabricate mounting plate	Building 5 fabrication shop	X					
11			fabricate harnesses	mid-level EE technician	X					
12			procure fasteners							
13			schedule TVAC chamber with 549				Chamber 235			
14			generate mounting plate drawings							
15			install mounting plate							
16			acquire test power supplies							
17			create Labview data displays							
18			obtain data acquisition system							
19			create 24/7 shift staffing plan							
20			create list of required materials & supplies							

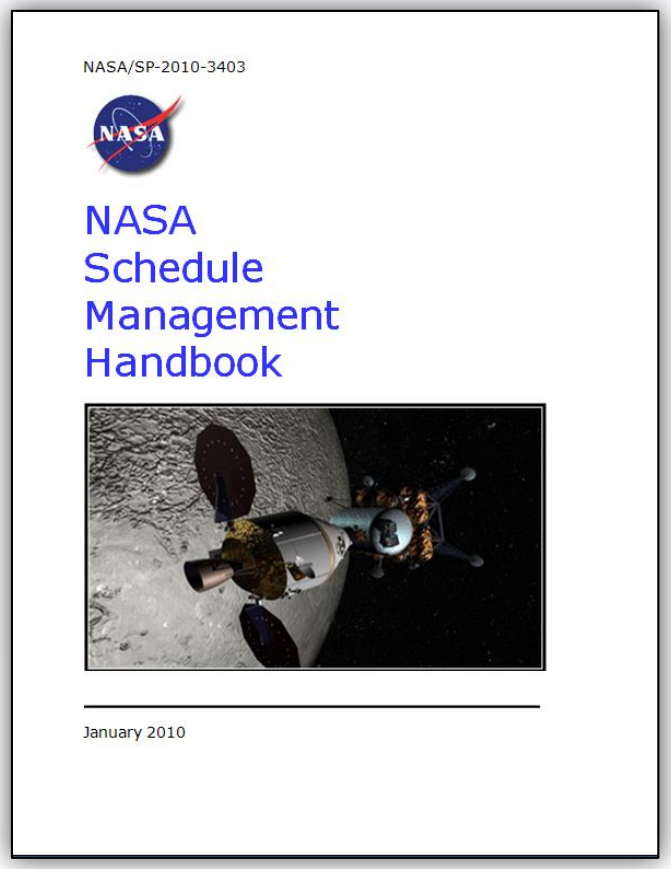
List of Things To Do | **Flight TVAC Test** | Fabricate Flight Panels | Flight Vibe Test | Risks

Schedule Enough Time



Source: GSFC Product Development Lead Training Program – Schedule Matters

Resource: Schedule Management



Chapters

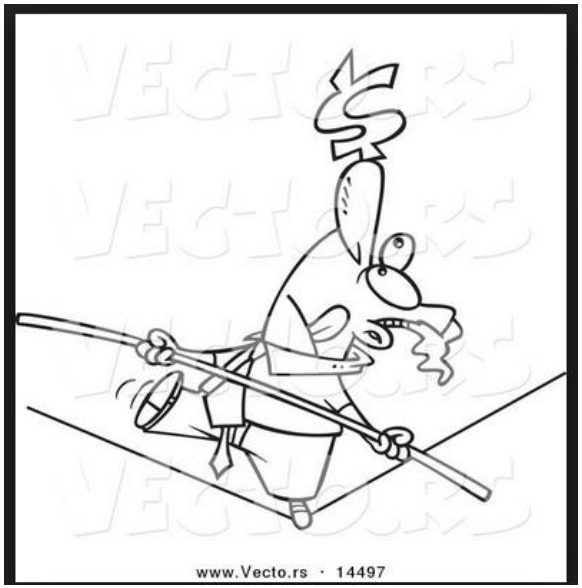
1. Introduction
2. Schedule Management Overview
3. Schedule Management Tool Considerations
4. Pre-Schedule Development Activity
5. Integrated Master Schedule Development
6. Status Updates and Schedule Maintenance
7. Schedule Assessment and Analysis
8. Schedule Control
9. Schedule Reporting
10. Schedule Data & Lessons Learned Archival

Download the NASA Schedule Management Handbook at:
http://evm.nasa.gov/handbooks.html

Develop a Realistic Spending Plan

If you have to do it…it will cost $$

Take time to itemize the spending plan – ensure it includes an estimated cost for each and every activity and task



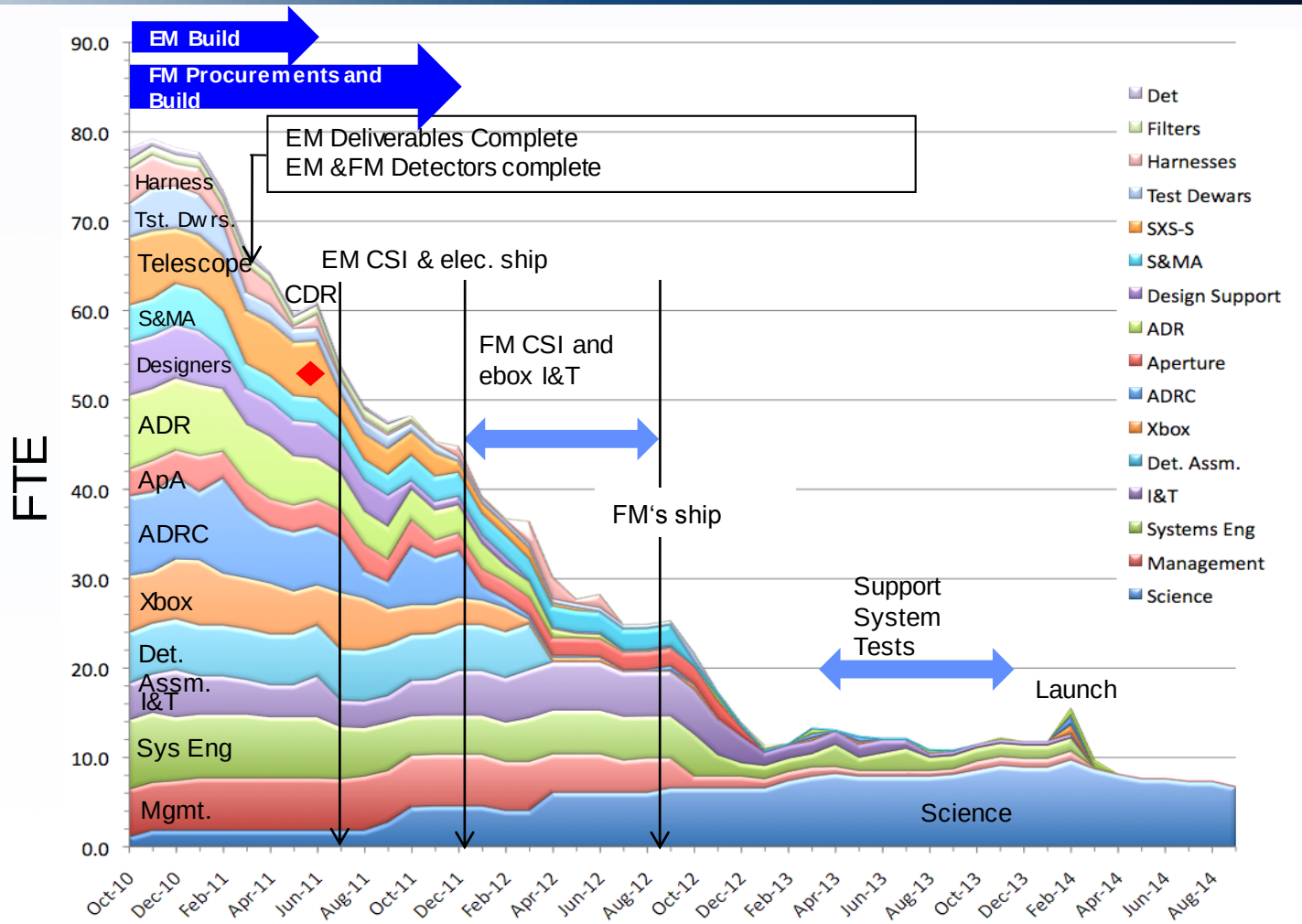
STAYING WITHIN YOUR COMMITMENT

Staying On Plan

1. Evaluate plan against the Commitment

Is it real…or is it Memorex?

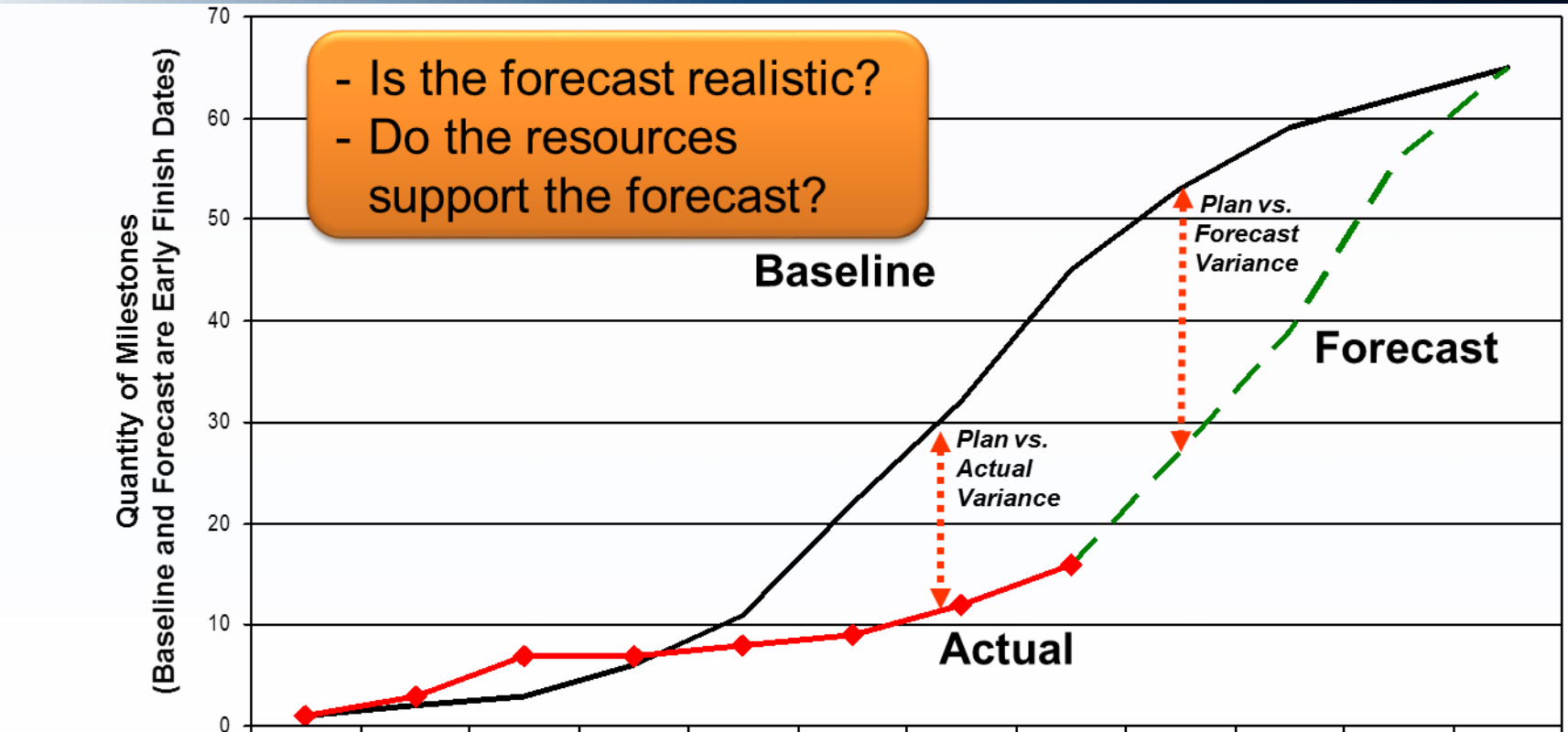
Examine the Profile – Does It Make Sense?



Know Where You Are Headed…

2. Metrics, tracking, controls, forecasting

Can You Really Do It?



	Oct '05	Nov '05	Dec '05	Jan '06	Feb '06	Mar '06	Apr '06	May '06	Jun '06	Jul '06	Aug '06	Sep '06
Cum Baseline	1	2	3	6	11	22	32	45	53	59	62	65
Cum Actual	1	3	7	7	8	9	12	16				
Cum Forecast								16	27	39	56	65

Source: GSFC Product Development Lead Training Program – Schedule Matters

Know the Risks…

3. Mitigate, mitigate, mitigate…!

Before it rains…

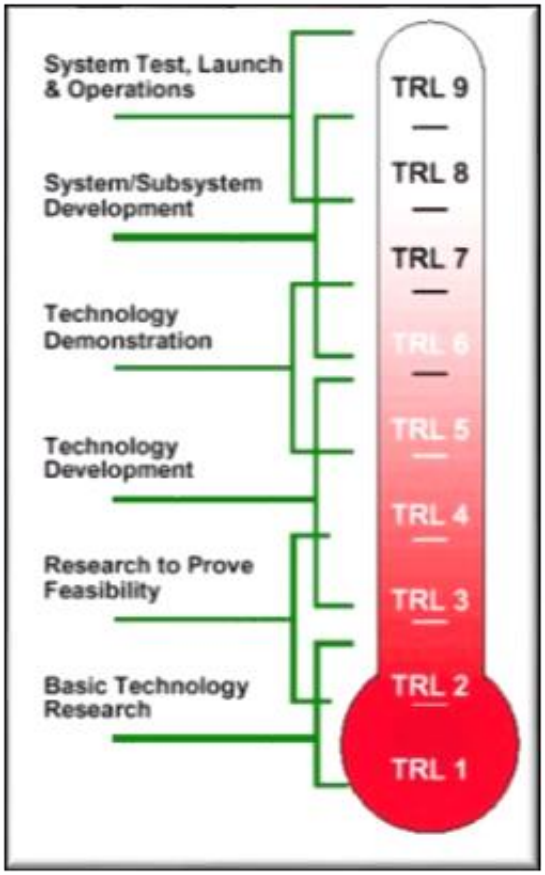
"I always try to live within my means but I have to borrow money to do so."

OUT OF THE BOX?

CONTRIBUTORS TO OVERRUNS

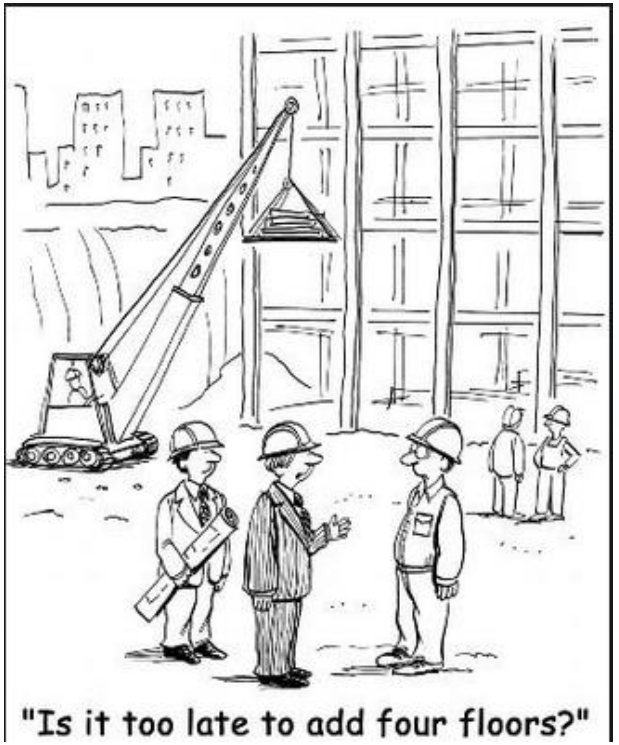
Lower Than Expected Technology Maturity

- Ensure the development/demonstration plan is well thought-out
- Fully cost the development/demonstration plan, independently verify appropriateness, secure adequate funding, provide some contingency
- Properly bound what needs to be demonstrated: hardware, interfaces, environmental exposure
- Develop clear performance requirements to demonstrate technology readiness (maturity)
- Identify key milestones and track progress

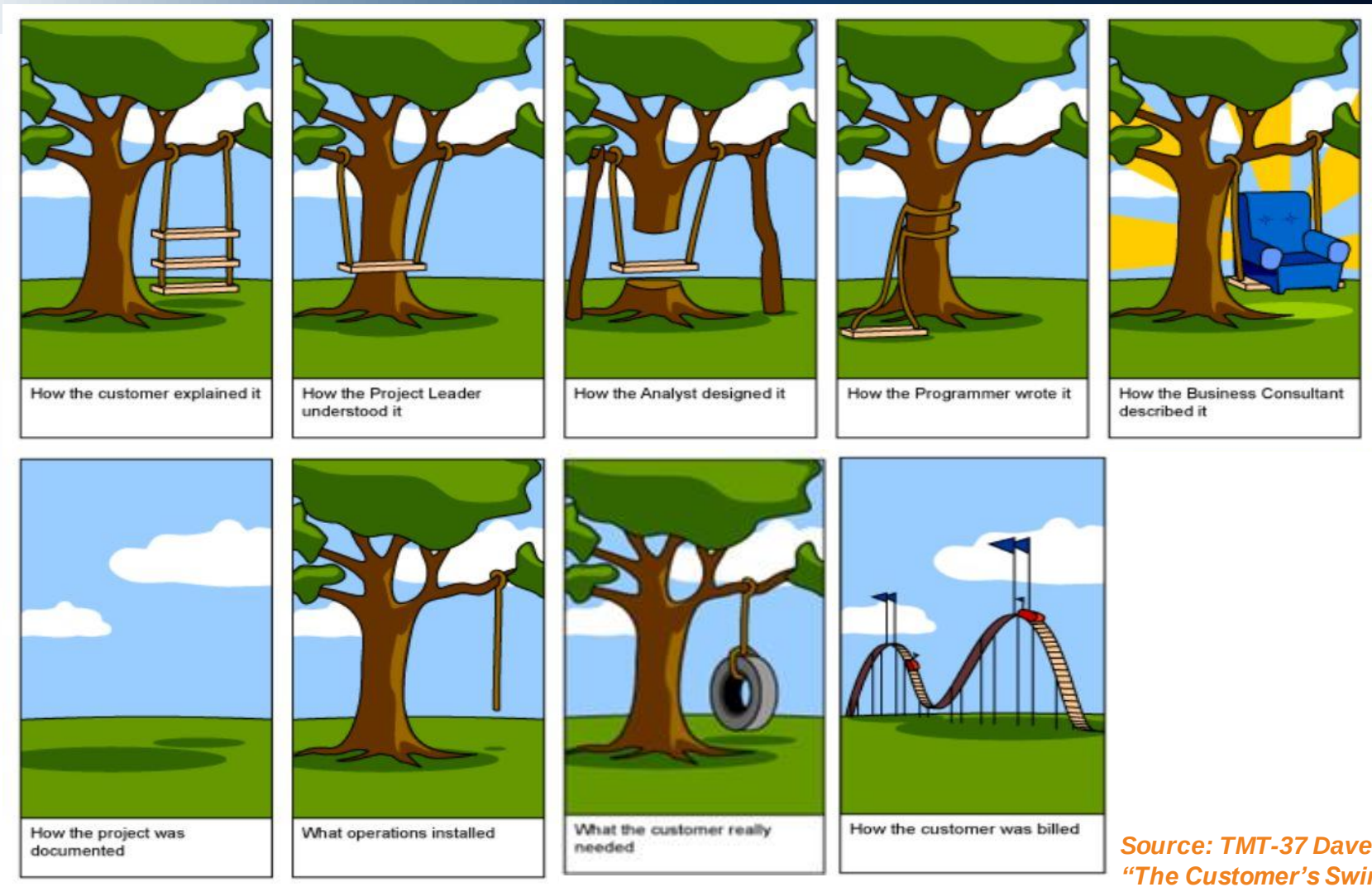


Requirements / Scope Creep

- Ensure requirements and scope are well understood, well-defined and documented
- Understand science/mission objectives with respect to subsystem hardware performance
- Follow formal control process for requirements and scope changes
- Realistically assess design complexity and technology maturity
- Work to meet requirements; not to exceed expectations
  - 'Better is the enemy of good enough'



Better Than What You Wanted!



Source: TMT-37 Dave Scheve, "The Customer's Swing"

Paralysis…


ESSENTIALS OF RISK MANAGEMENT:
1. DON'T DO ANYTHING WRONG TODAY.
2. DON'T DO ANYTHING WRONG TOMORROW.
3. REPEAT.
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25 Hours In a Day…

- Develop executable build/test flow
  - Use past experience to determine realism of activity durations and de-scope options
- Plan the most cost-effective path forward applying resources efficiently
  - Ensure there is adequate funding to complete required activities according to plan
- Eliminate activities rather than reduce activity durations
  - Use risk-based decision making
- Know key receivables required to meet critical milestones

"It's not easy fitting 60 minutes of exercise into my busy schedule. Today I took 360 ten-second walks."

Holding On a Little Too Long…

Know when it's time to cut

De-scope early and before it's a life or death situation

It Costs How Much…?

- Use most current fully-loaded labor rates for contractor engineering support
  - Use actual labor rate tables
- Include fees (lab, calibration, software licenses, etc.), taxes and miscellaneous costs (consumables, computer equipment, lab supplies, etc.) in spending plan
- Use current vendor ROMs and bids
- Assume inflation for costs in 'out years'
- Ensure spending plan includes cost estimates for every activity planned in the schedule

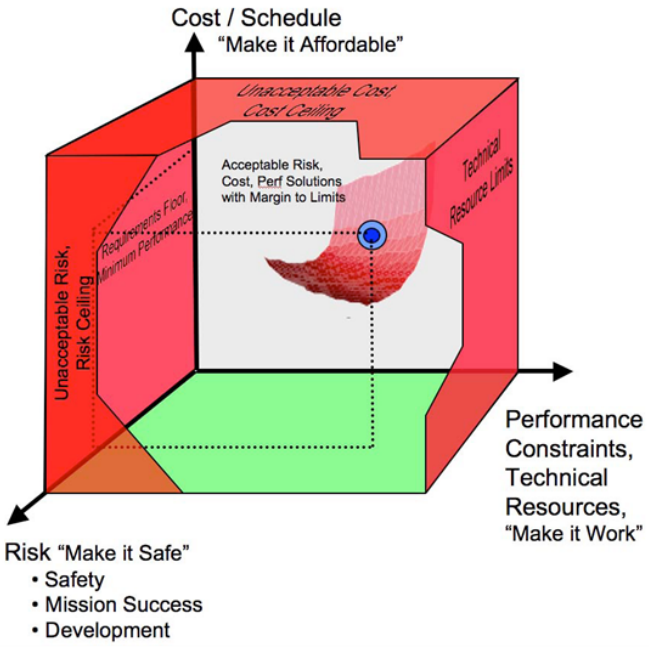
GOOD, BETTER, BEST

HELPFUL TIPS

Communicate Problems…Early!

"So what you're saying is that we've been defunct and out of business for over two years and you've just been waiting for the right time to tell me?"

Anything Can Be Engineered, But…



"Make it work"

Does my product meet customers needs and objectives?

- Ensure the design meets required performance
- Ensure the constraints and technical resources are acceptable

"Make it safe"

How will my product fail and how can it be improved?

- Ensure the design has appropriate level of margin, predictable and sufficiently reliable to meet mission success

"Make it affordable"

How will my product impact costs?

- Ensure to understand the schedule and cost impact for all design decisions

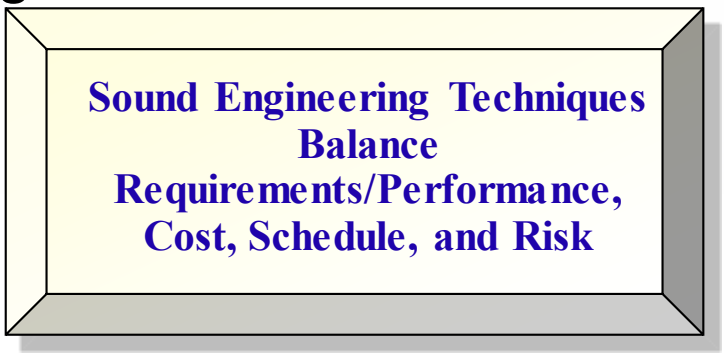
Any decision resulting in the design solution being out of the box is potential risk

Guiding Principles

- Is it good enough?
- Are the right people doing the right thing?
- Work not done today means higher cost tomorrow

Never catch up in I&T phase

- Delays are not automatic withdrawals from the contingency/reserve bank account
- "Can do" means we can implement the right engineering solution within schedule and cost



Got To Be Real…!

Conservatism and optimism must be balanced with programmatic expediency, but only realism is your friend