



**How applying the
Team Software ProcessSM (TSP)
and Personal Software ProcessSM (PSP)
can increase Software Supportability**

**Prepared For:
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NAVAIR Systems/Software Support Center (NSSC)**



Objective

- What is PSP/TSP¹?
- Organization Background
- Some NAVAIR results using TSP

¹Personal Software Process, PSP, Team Software Process, and TSP are service marks of Carnegie Mellon University



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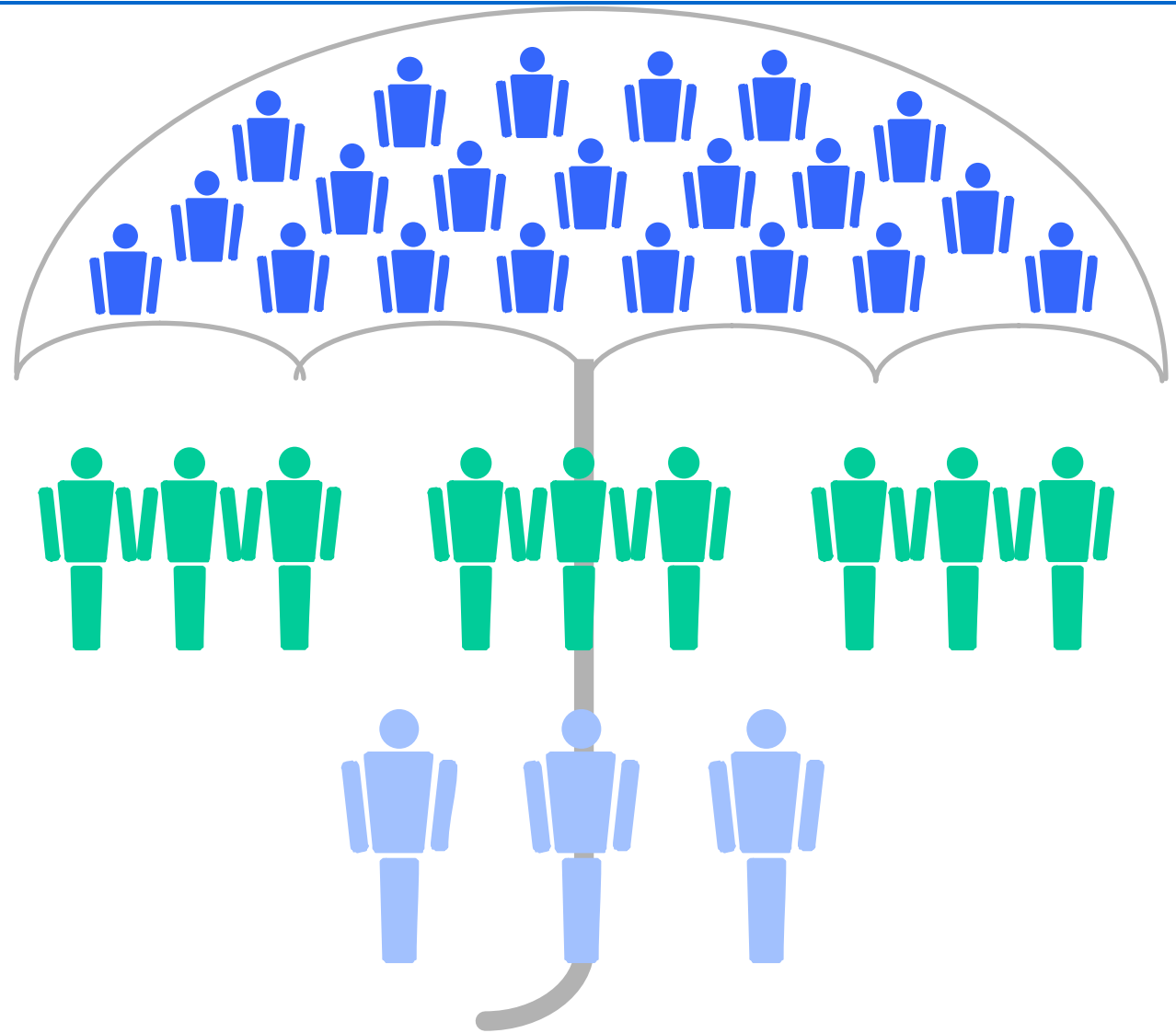


CMM / CMMI, TSP, & PSP Relationship

**CMM / CMMI -
*Builds
organizational
capability***

**TSP - *Builds
quality products
on cost and
schedule***

**PSP - *Builds
individual skill
and discipline***



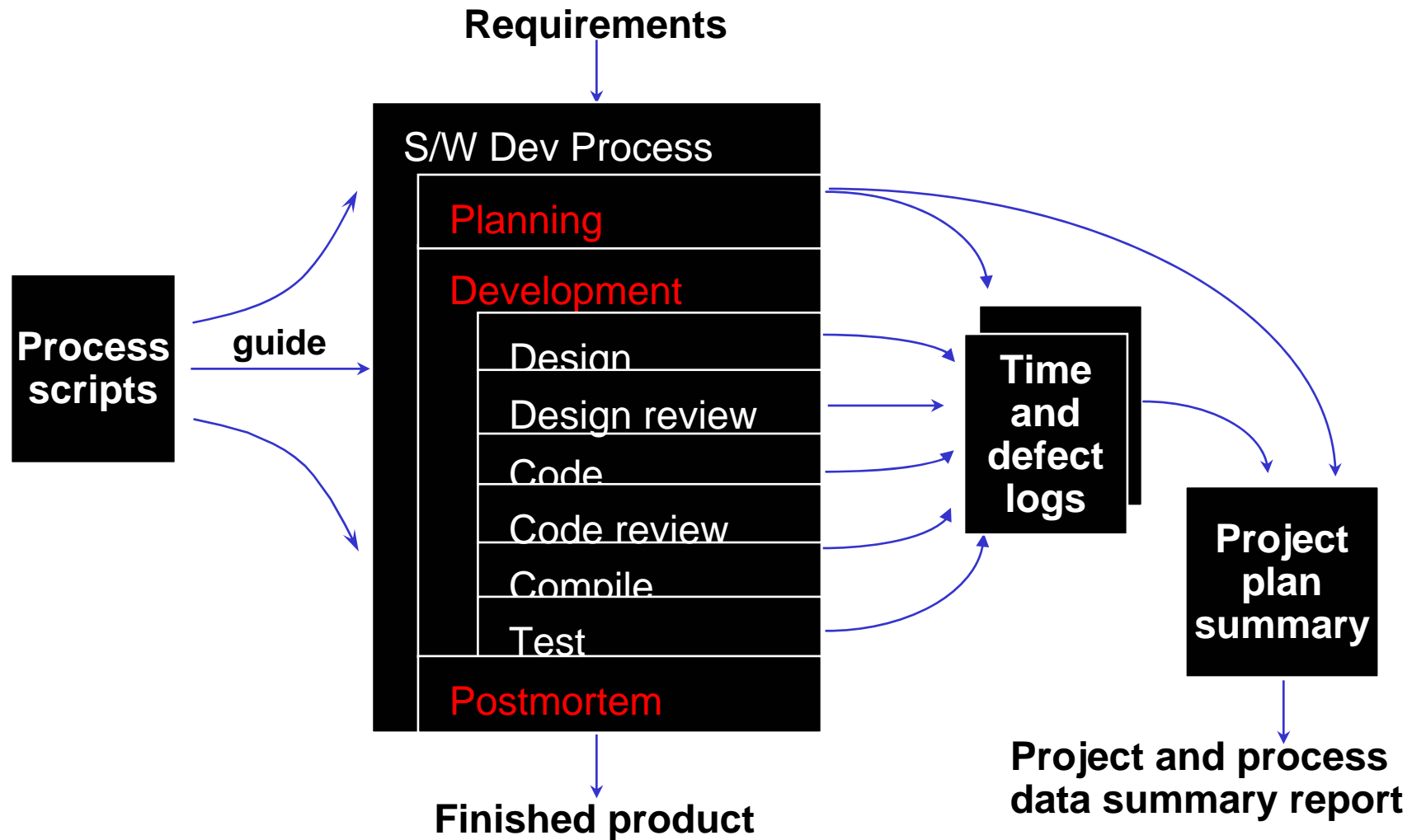


What is Software Process

- Detailed scripts
- Forms and templates
- Checklists
- Data and information
 - Metrics
- Supporting tools
 - Only after the process is understood

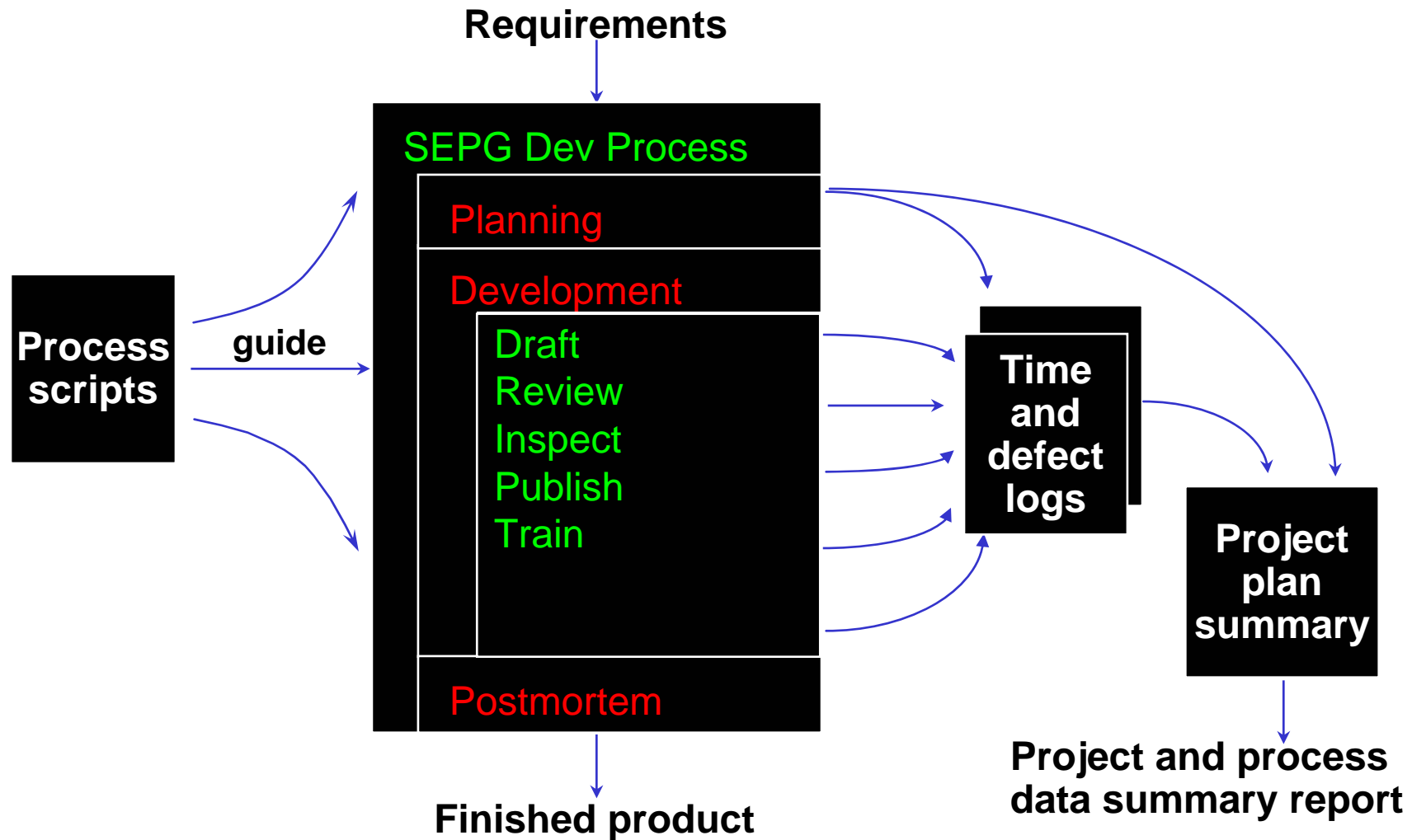


Process Flow



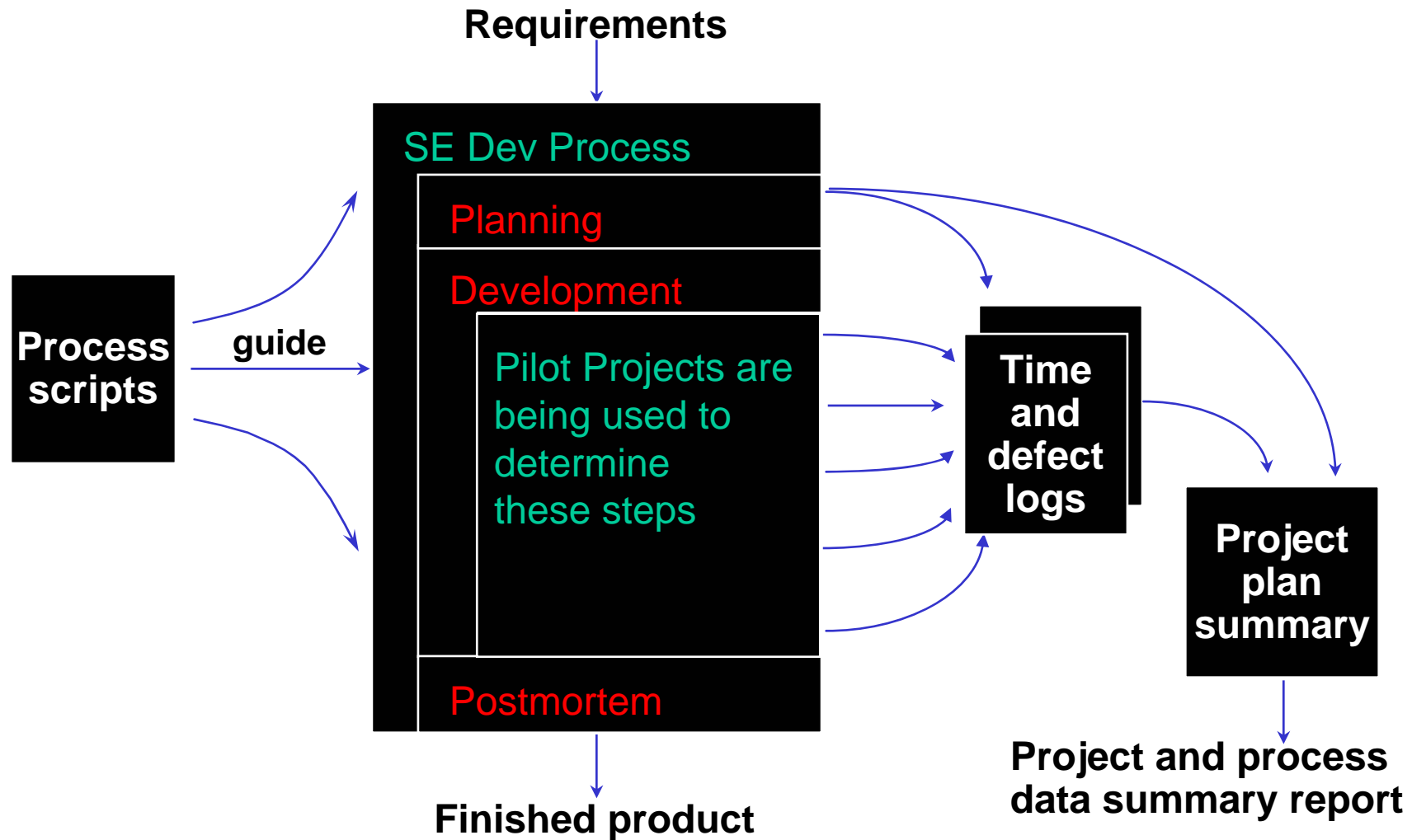


Process Flow



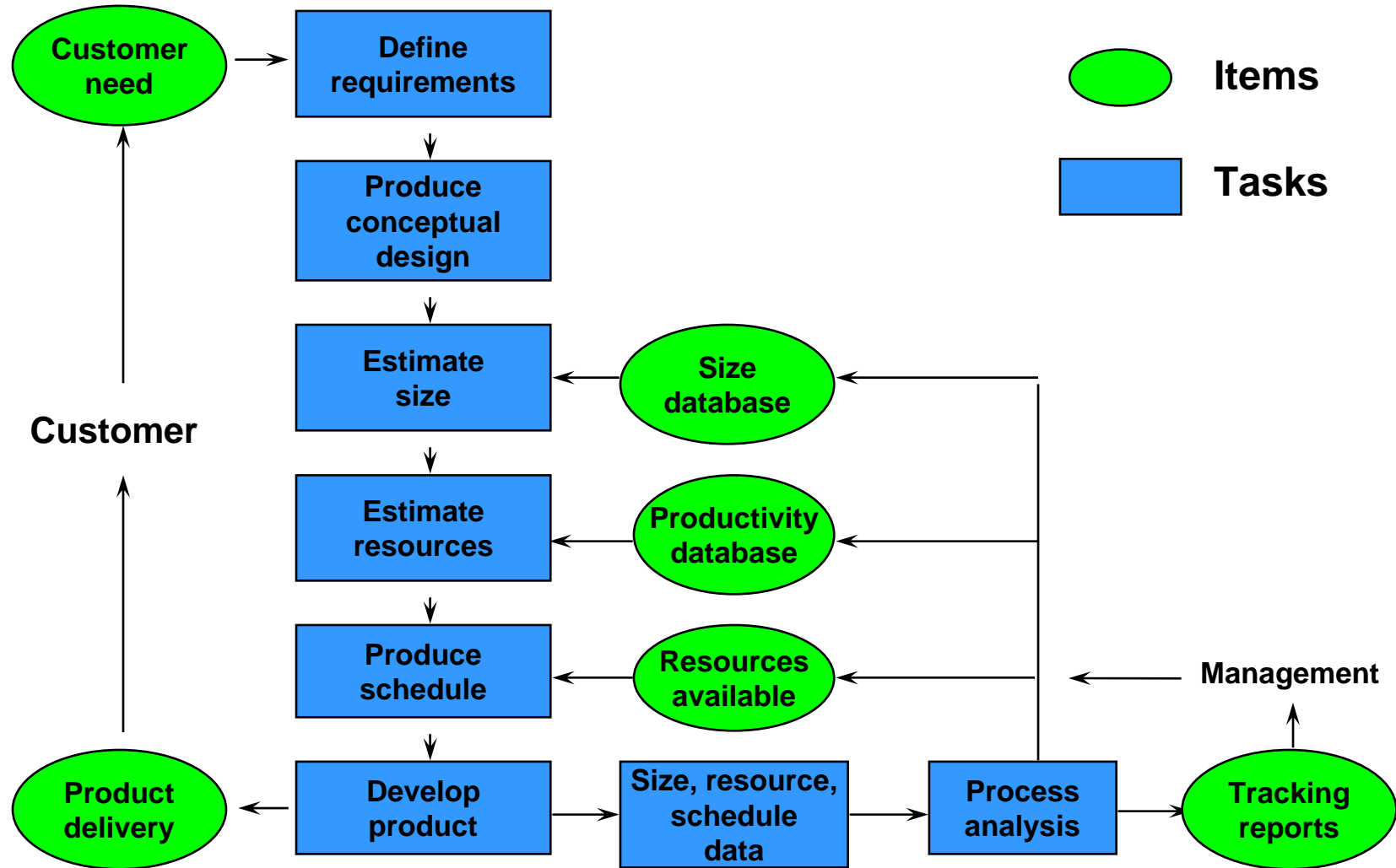


Process Flow



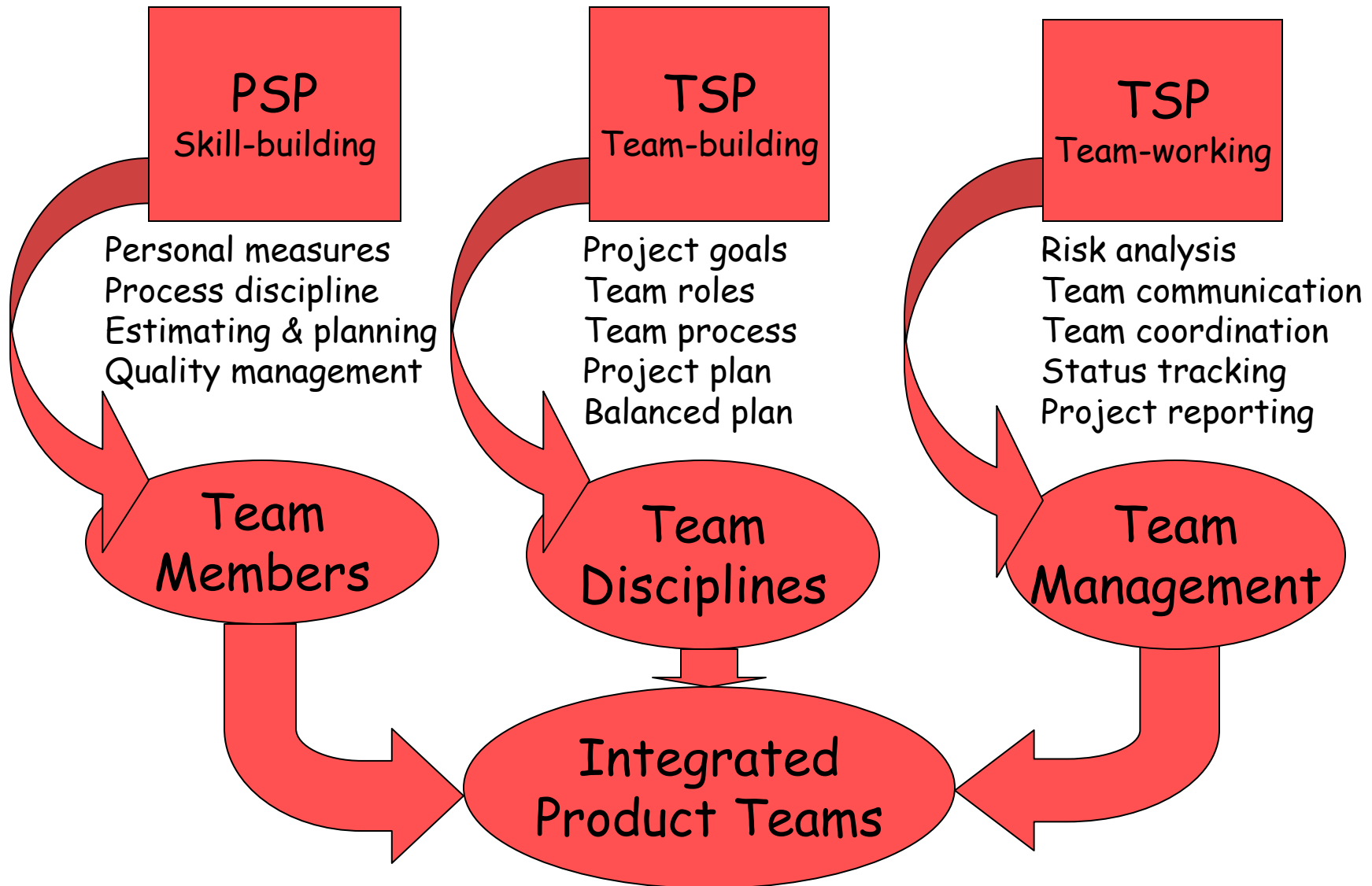


The Planning Framework



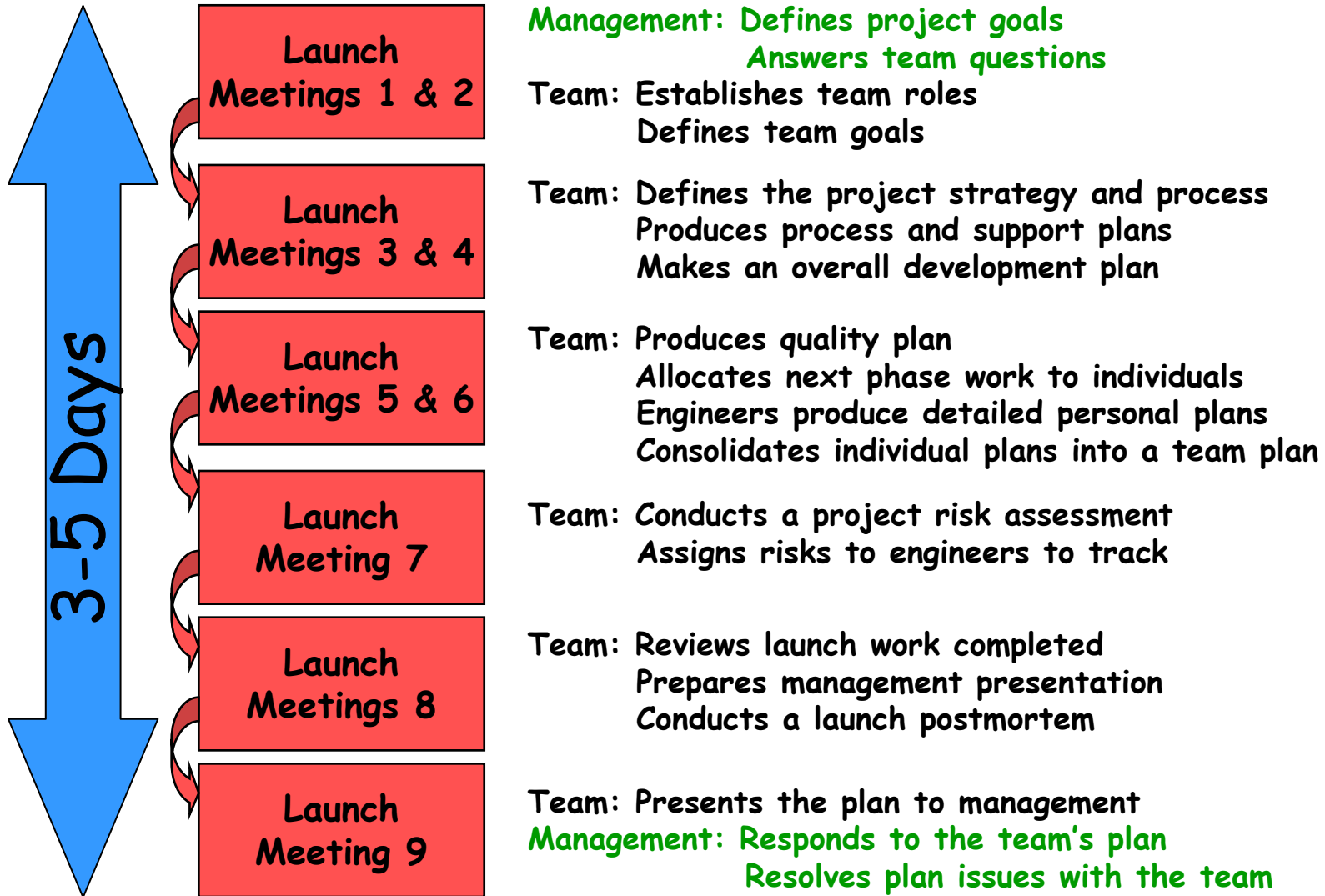


TSP Builds Effective Project Teams



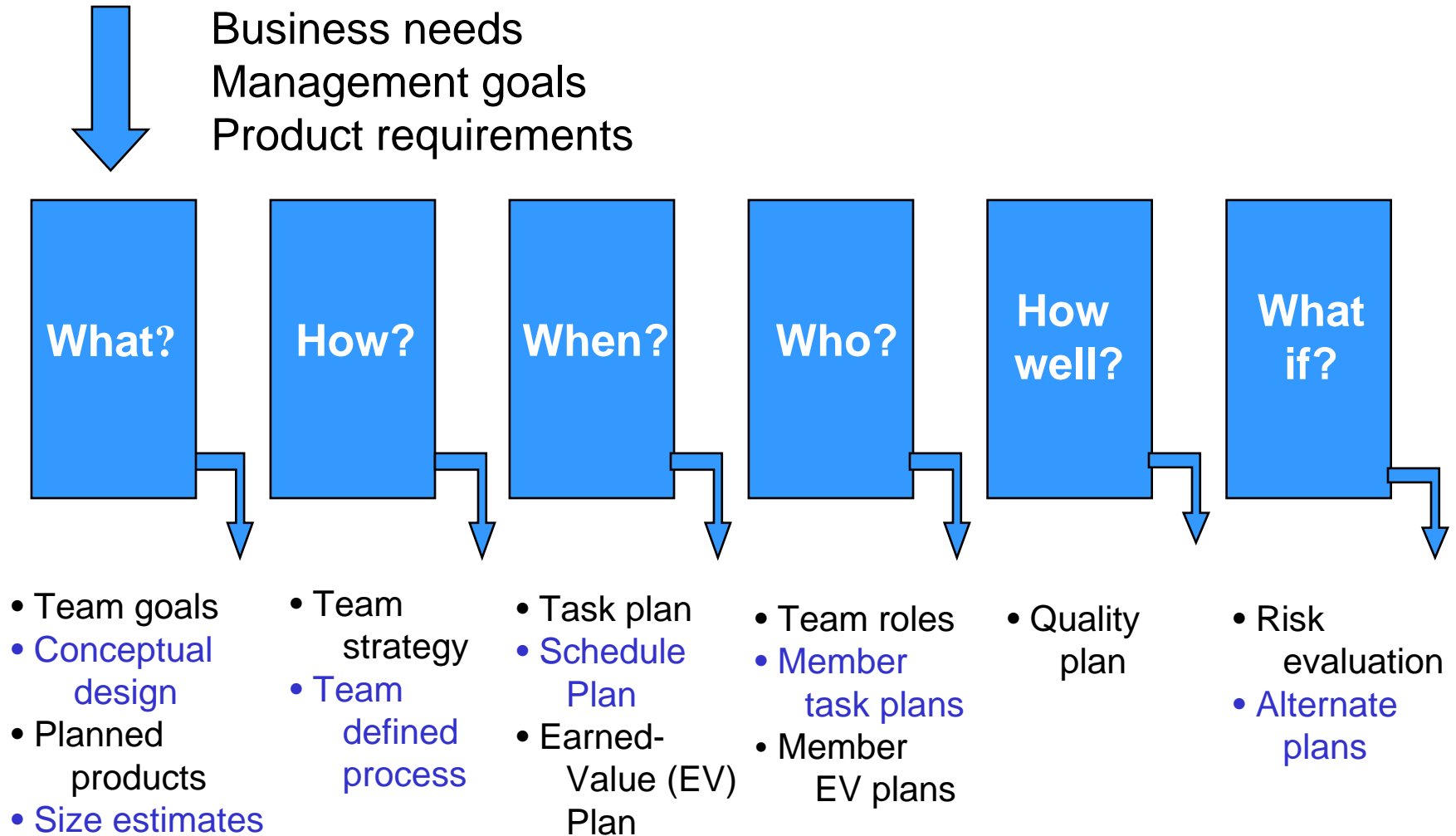


The TSP Launch Process





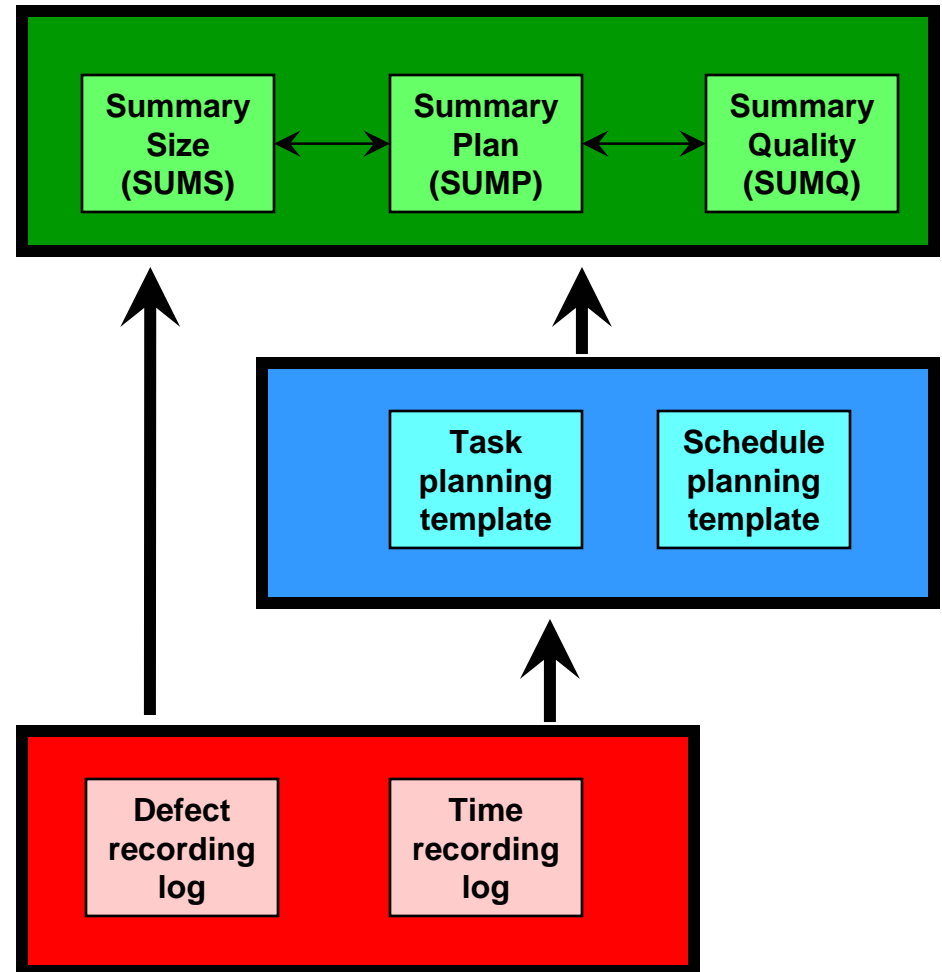
The TSP Launch Products





Personal Tracking

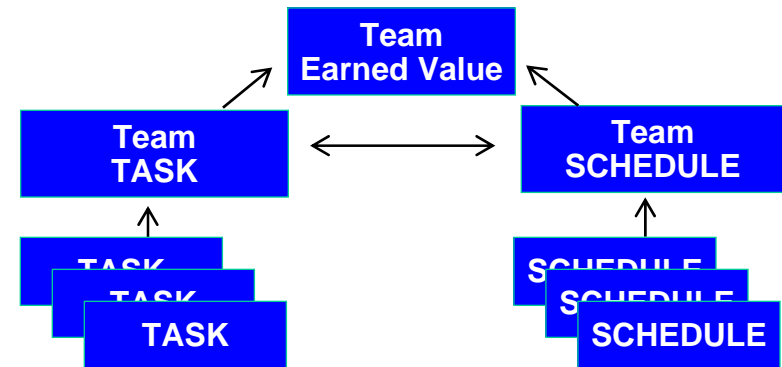
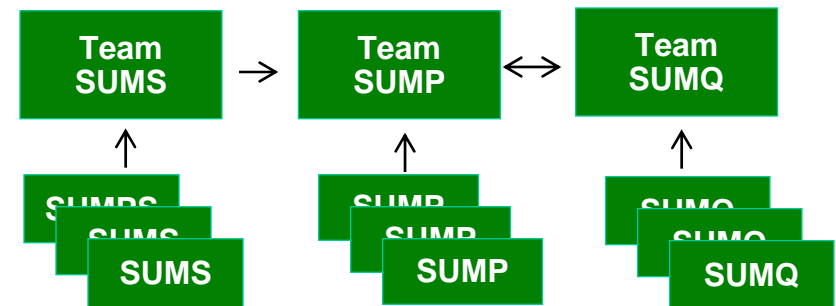
- Each team member gathers data on size, time, defects and schedule.
- These data are used for tracking at the personal level.
 - plan vs. actual hours
 - plan vs. actual product size
 - plan vs. actual product and process quality
 - plan value vs. earned value
 - predicted earned value





Team Tracking

- Summary data from team members is rolled-up to produce team status.
- The team reviews status at the weekly team meeting.
 - plan vs. actual hours
 - plan vs. actual product size
 - plan vs. actual product and process quality
 - plan value vs. earned value
 - predicted earned value
 - risks and issues





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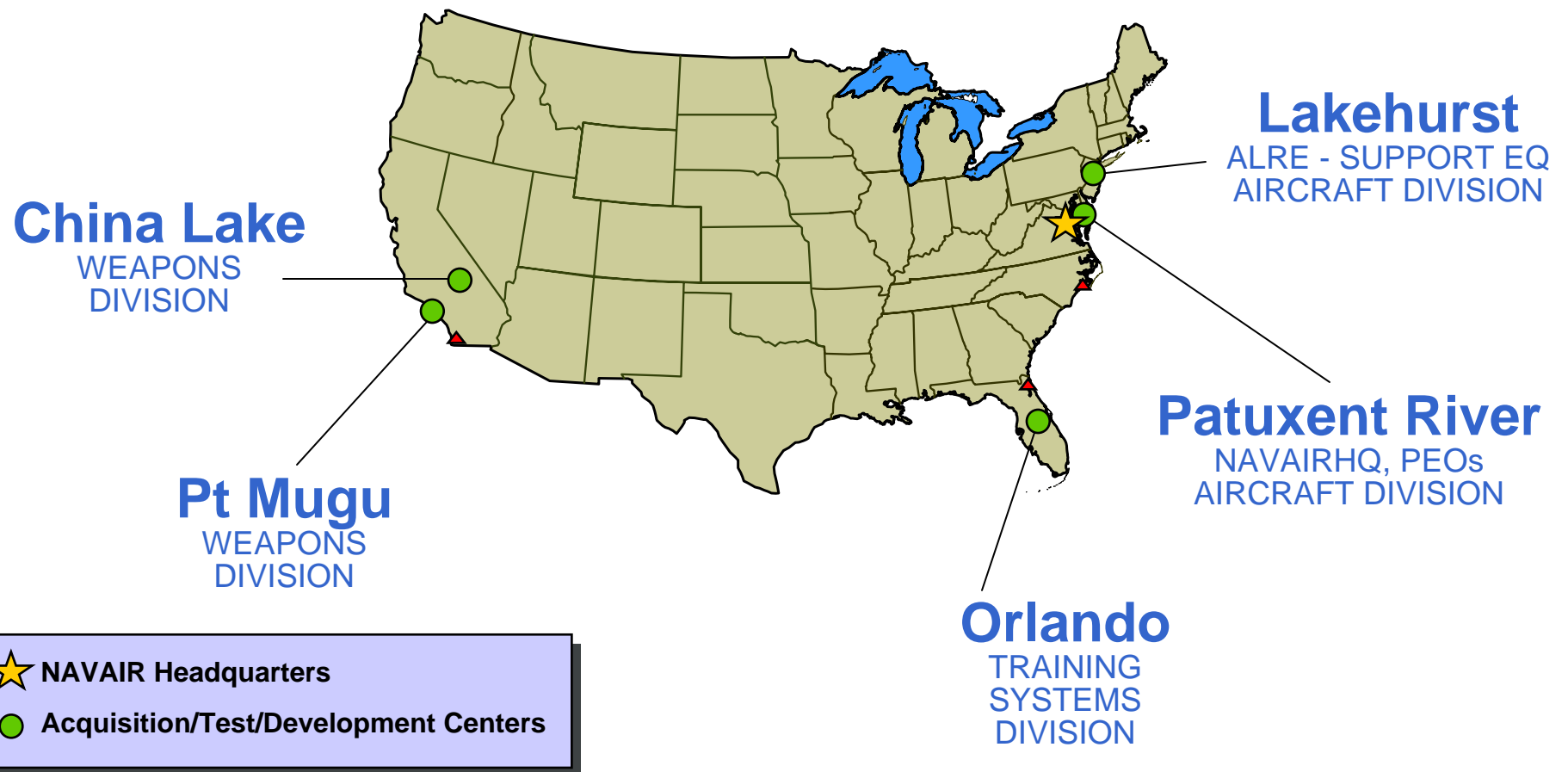


What is NAVAIR?

- NAVAIR is the Naval Air Systems Command.
- We **develop, acquire, and support the aircraft and related weapons systems** used by the U. S. Navy and Marine Corps.
- We translate the needs of the Navy and Marine Corps into the technical and financial requirements needed by industry to actually produce an aircraft or other weapon system.
- Our goal is to **provide the fleet with quality products** that are both affordable and available when they are most needed.
- Our **support extends across the entire life span of a product**, including all upgrades and modifications to that product.



NAVAIR Major Sites



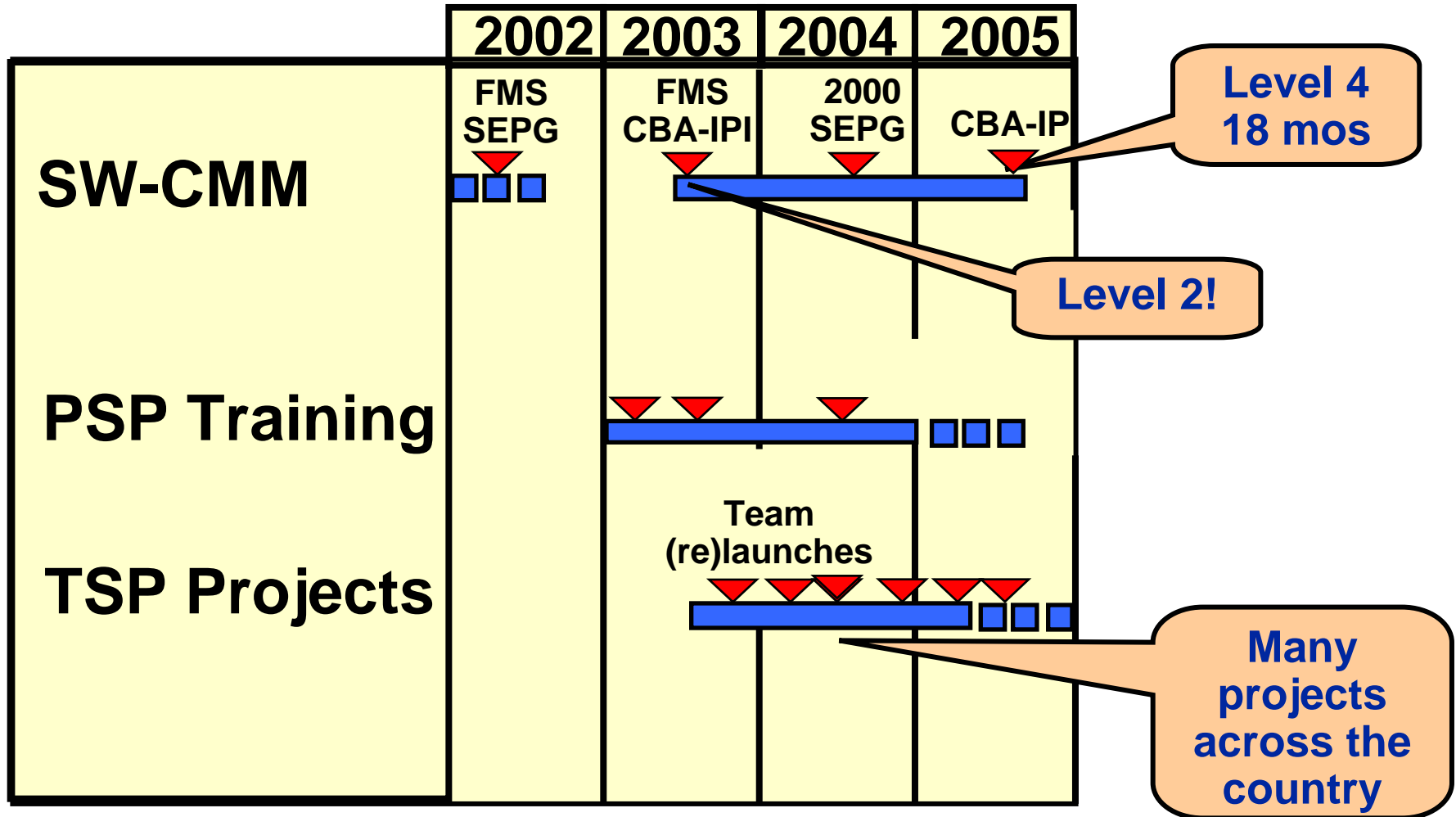


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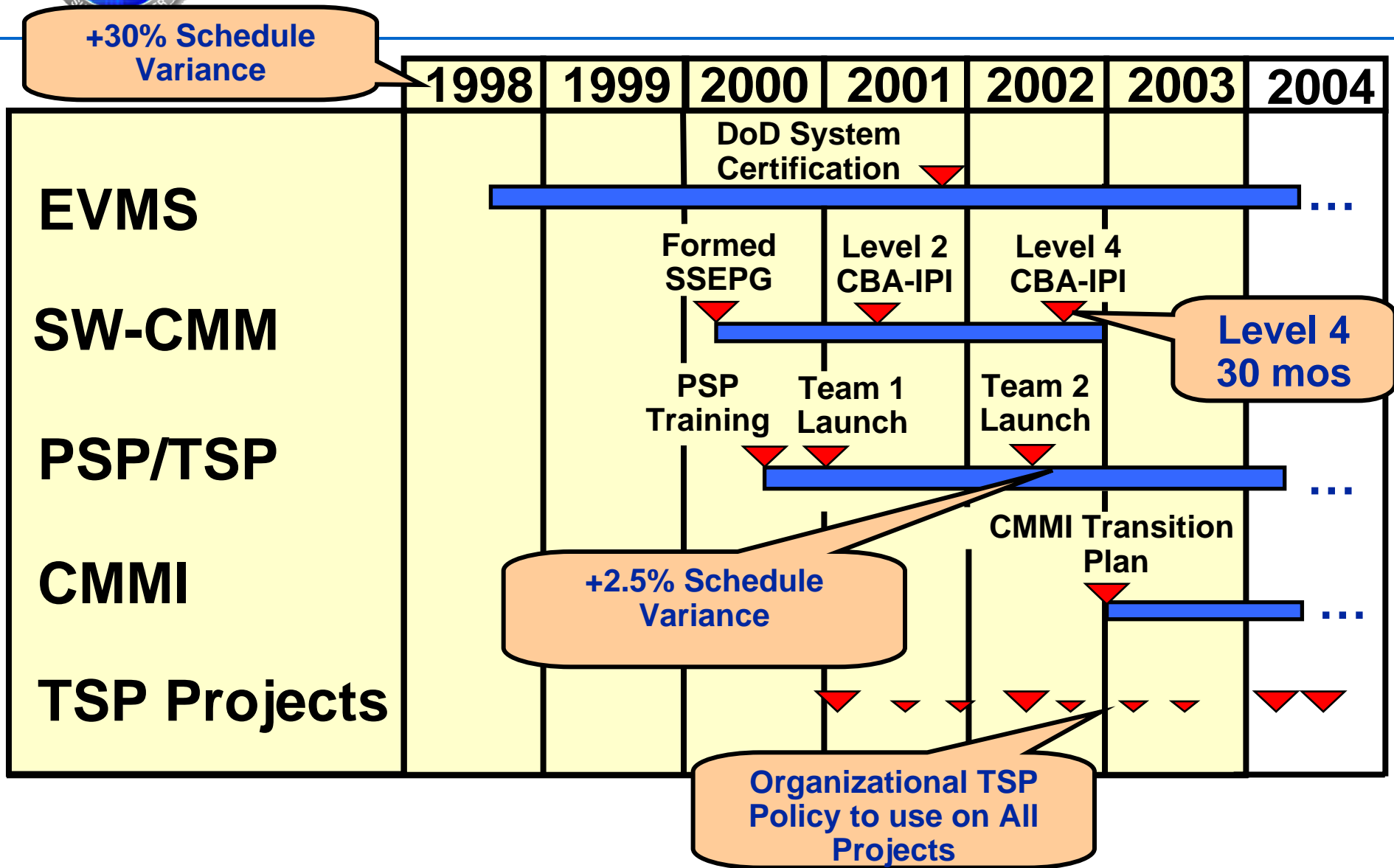


E-2C PI Success Story





AV-8B PI Success Story





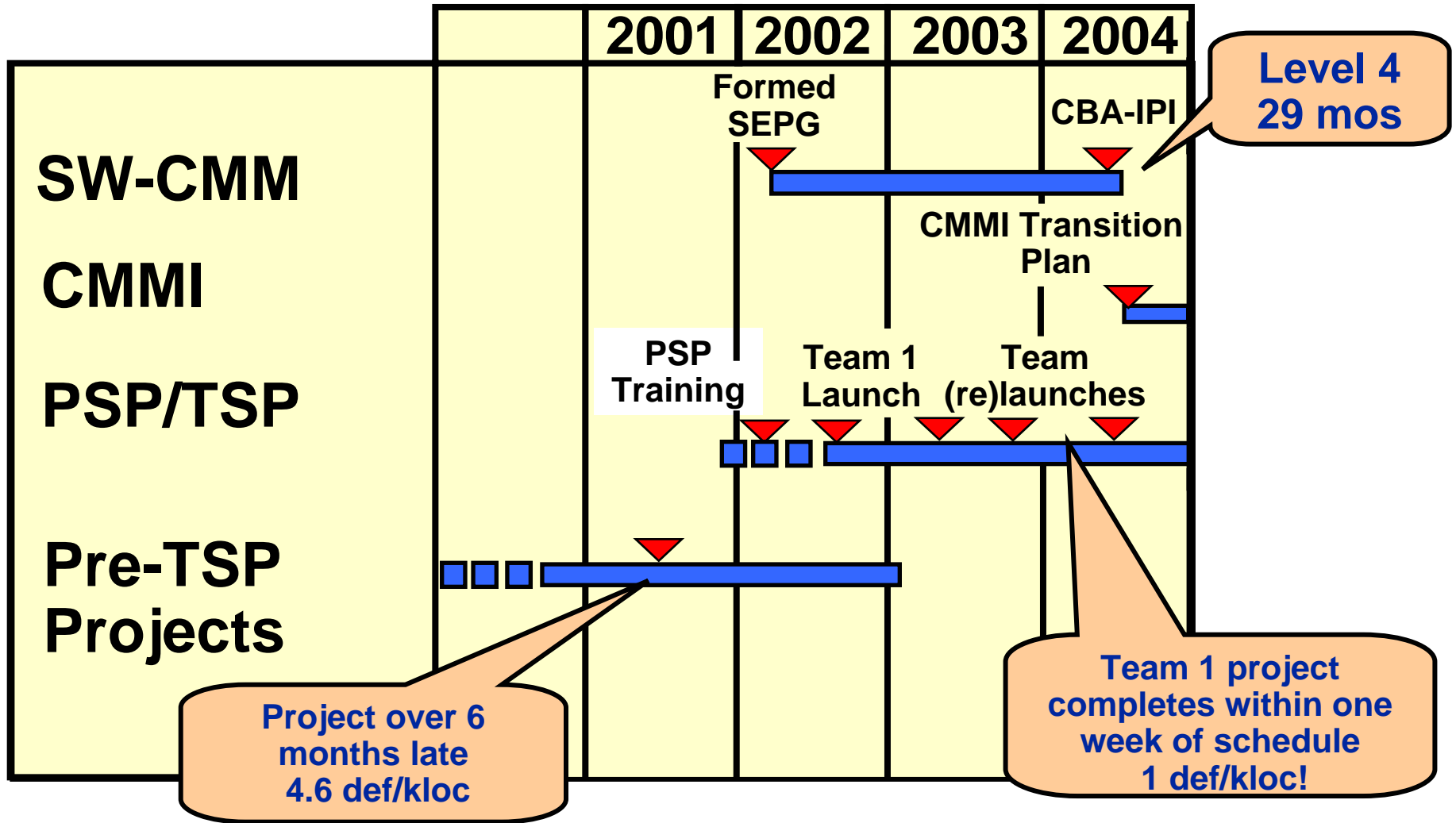
Return on Investment within NAVAIR - 1

	Product size (KSLOC)	Defect density (defects/KSLOC)	Number of defects	Cost of addressing one defect	Cost of addressing all defects
WARP (before TSP)	443	1.13	501	\$8,330	\$4,169,831
AVJMPS (after TSP)	443	0.59	261	\$8,330	\$2,177,169
Cost saving from reduced defects					\$1,992,663
Cost of TSP training & support					\$225,300
Total cost savings from reduced defects					\$1,767,363

AV-8B Return-on Investment Using PSP & TSP



P-3C PI Success Story





Return on Investment within NAVAIR - 2

: The Return on the investment in TSP after one project at P-3C.

	KSLOC added/changed for a project	Defect Density KSLOC	Number of SPRs	Avg SPR Fix Cost	Total SPR Fix Cost	Productivity (KSLOC/Hr)	Developer Hrs	Code Dev Cost
Before TSP	27.8	4.6				2.7		
Hypothetical Dev costs Before TSP	38.3	4.6	176	\$8,432	\$1,486,843	2.7	14,198	\$1,334,568
Baseline Dev costs After TSP	38.3	0.6	23	\$8,432	\$193,936	4.3	8,915	\$837,984
Cost Saving					\$1,292,907			\$496,583
Combined Cost Saving					\$1,789,490			
TSP Training & Support					\$311,247			
Cost Saving on 1st Product					\$1,478,243			

P-3C Return on Investment Using PSP & TSP



Questions?

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- References:
 - WWW.SEI.CMU.edu
 - Mapping TSP to CMMI, CMU/SEI-2004-TR-014
 - Relating the Team Software Process (TSP) to the Capability Maturity Model for Software (SW-CMM), CMU/SEI-2002-TR-008



Abbreviations

- CBA-IPI – CMM Based Appraisal for Internal Process Improvement
- CMM – Capability Maturity Model - Software
- CMMI – Capability Maturity Model – Integrated
- DoD – Department of Defense
- EVMS – Earned Value Management System
- NAVAIR – Naval Air Systems Command
- NSSC – NAVAIR Systems/Software Support Center
- PI – Process Improvement
- PSP – Personal Software Process
- SEI – Software Engineering Institute
- TSP – Team Software Process