



**There is a Method to this Madness:
Transforming Appraisal Findings into a
Process Improvement Plan**

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Our Organization

Raytheon

Network Centric Systems, Fullerton, CA

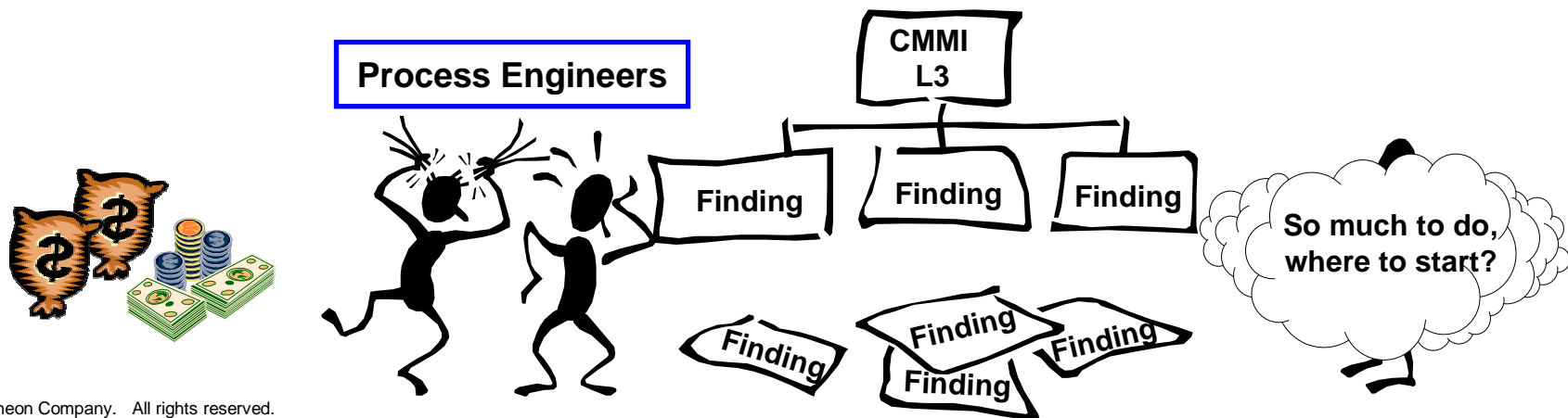
- ★ **Achieved SW-CMM Level 5 in October 1998**
- ★ **Achieved SW-CMM Level 5 in September 2002**
- ★ **Achieved SE CMMI Level 2 in October 2002**



So much to do and where to start?

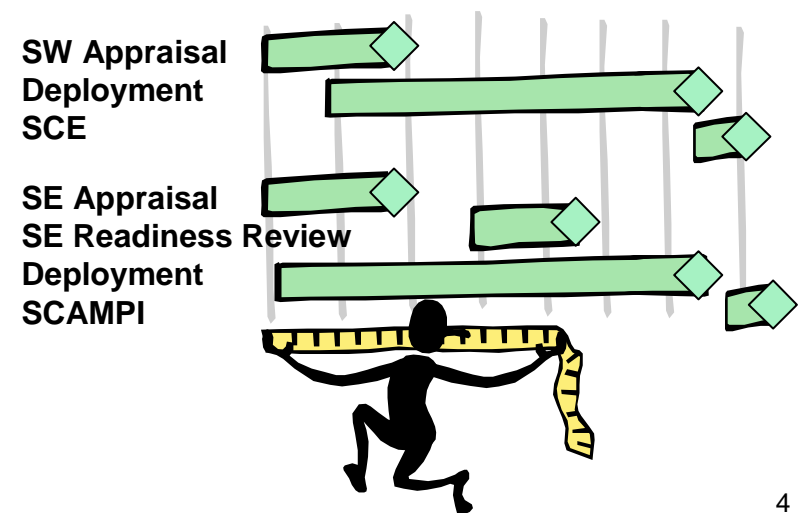
- Long list of findings from appraisals?
- Management wants to be Level 'x' by when?
- Where to get started?
- Can it be done with limited resources within time frame?
- How to develop a plan of action?
- How to manage to plan?

Is there a method to this madness?!?

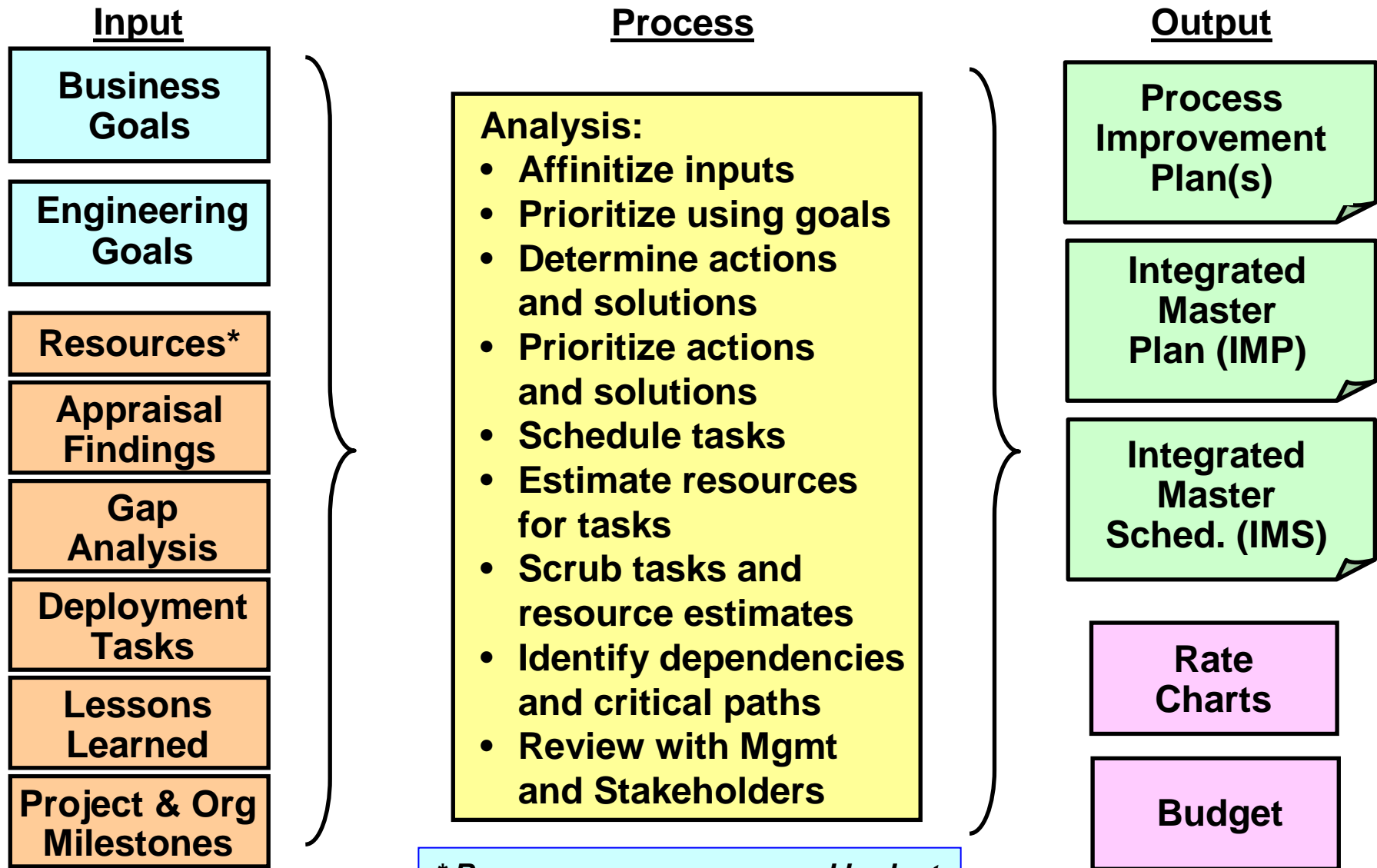


The Method is Proven

- This method has worked for both implementation of the SW-CMM and CMMI at Fullerton
- SW and SE Maturity Goals and plans were established in April 2001
- Fullerton achieved goals as planned
 - SW-CMM Level 5 in 9/02
(twice in a row)
 - SE CMMI Level 2 in 10/02



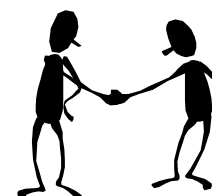
Transform Findings to Plan



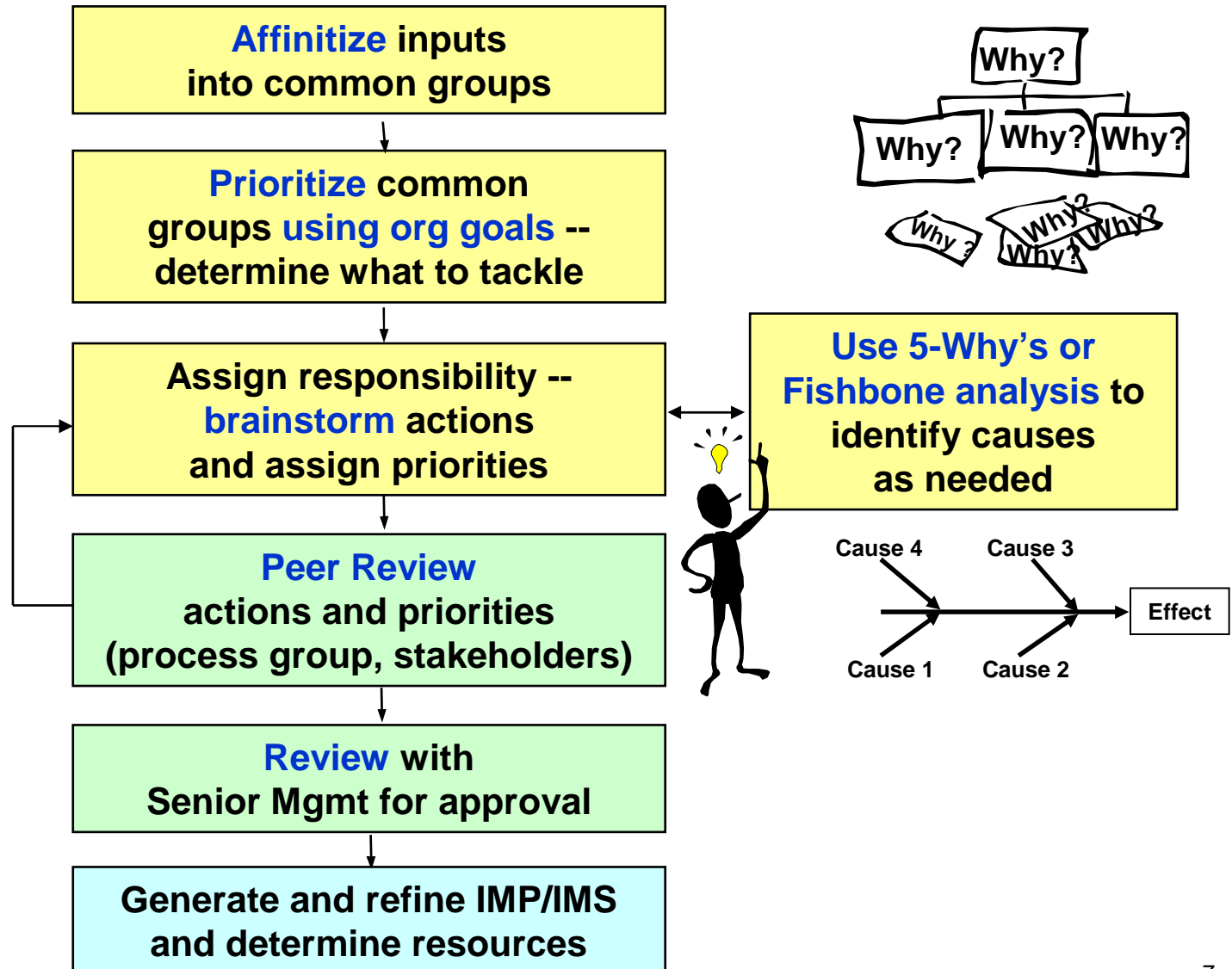
* Resources = manpower and budget

Work with Management

- Review Business and Engineering Goals with Management - understand perspective
- Cultivate sponsorship
- Get management support to get project and stakeholders commitment and buy-in
- Ensure process improvements support goals
- Provide facts to support when goals can be achieved
 - Tasks in IMP/IMS
 - Resource loading - manpower & cost
 - Risks
- Provide alternate solutions & review risks

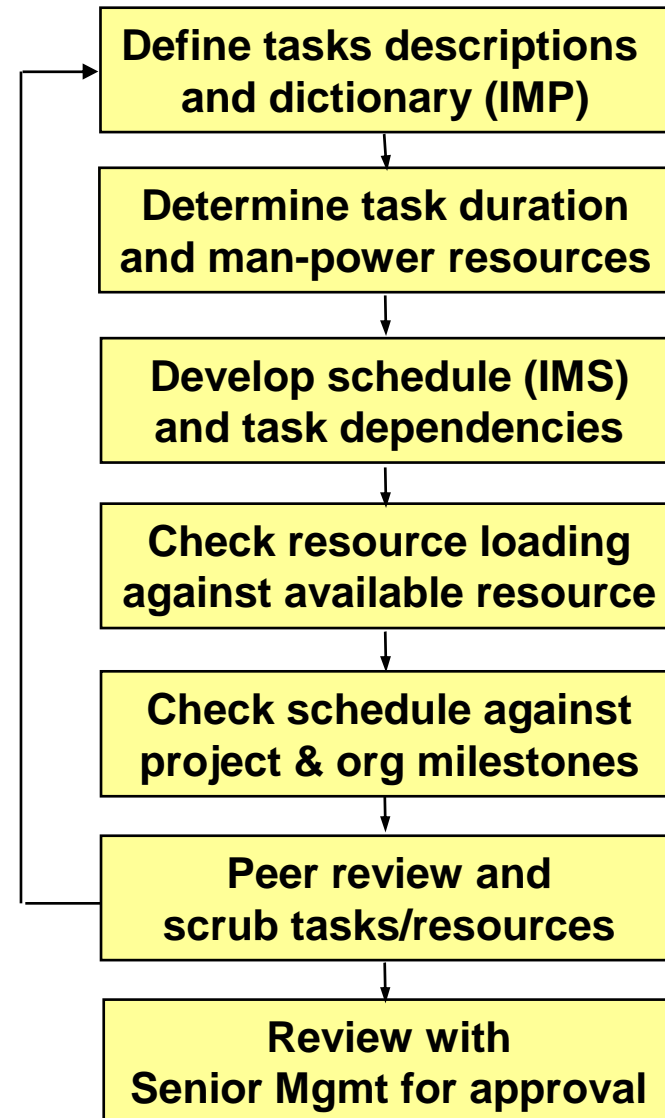


Use Analysis Tools



Generate and Refine IMP/IMS

- **Use historical data and engineering judgement**
 - May need to define process, e.g., directive development:
 - Write directive & change requests
 - Engineering Process Group (EPG) peer review
 - Revise directive
 - Stakeholder review
 - Revise directive
 - Release directive
- **Scrub tasks and activities to essentials**



Develop Process Improvement Plan (PIP)

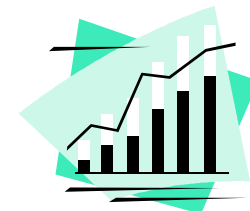
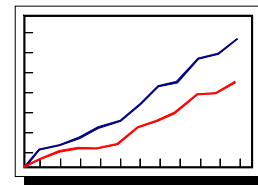
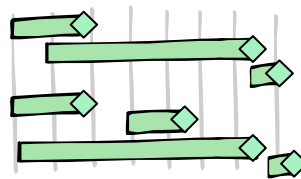
- Use IMP and IMS as input
- Flow down Business and Engineering goals
 - Identify long term strategic goals
 - Identify near term goals
- Describe operational concepts, roles and responsibilities
- Describe process improvement objectives, activities, and tasks
- Identify risks and man-power resources
- Include high level schedule
- Trace process improvement activities to Business goals, Engineering goals, and appraisal findings
- Peer review PIP and get approval from senior management
- Review PIP activities with project mgmt & stakeholders



Managing to Process Improvement Plan (PIP)

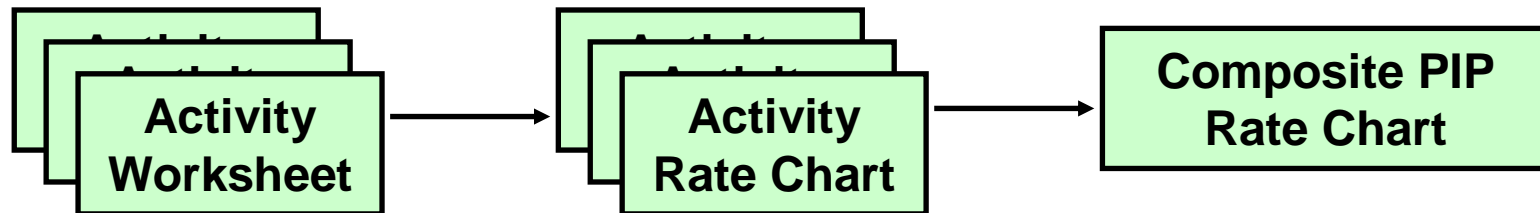
- Manage process improvement activities as a project
- Develop Monitoring and Control metrics and reports
 - Schedule Gantt Charts
 - Rate Charts - status of task completion
 - Budget - man-power
 - Risk Management
- Status progress weekly within Engineering Process Group
- Review project status at project process meetings
- Conduct periodic project review of progress against PIP status with senior management (include stakeholders)

Status Reporting	
G Y	Proc Improvement 1
G G	Proc Deployment 1
G G	OPD - directives released

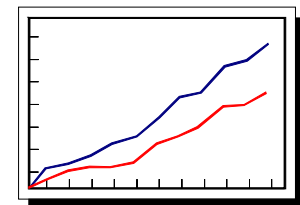


Rate Charts

Effective Tool for Measuring Progress



- **Rate Charts measure if the right amount of work is accomplished as planned**
- **Progress feeds into Earned Value**
- **Define inch stones and weight for taking completion credit, e.g., Building evidence notebooks**
 - Kickoff KPA notebook building activities
 - Redline review of evidence matrix
 - Built notebook with evidence
 - Peer review notebook
 - Update notebook evidence
 - etc.



Sample Rate Chart

Activity Worksheet Excerpt

Inch stones

KPA	POC	Kickoff	Redline Review	Notebook Built	Peer Review	Update Books	CMM Compliance Matrix	EPG Peer Review	Update Books	In pound Books	Action Plan Inputs	% Complete
Plansbook -Plan		06/21	N/A	07/16	07/19	07/26	N/A	08/09	08/23	08/30	N/A	
Plansbook -progress		100%	100.00%	90.00%			100.00%				100%	49.0%
Rptbook -Plan		06/28	N/A	07/19	07/26	08/02	N/A	08/16	08/23	08/30	N/A	
Rptbook -progress		100%	100.00%	20.00%			100.00%				100%	28.0%
SEN book -Plan		06/21	N/A	07/19	07/26	08/02	N/A	08/16	08/23	08/30	N/A	
SEN book -progress		100%	100.00%	100.00%			100.00%				100%	52.0%
Level 2												
RM -Plan		06/21	06/28	07/15	07/22	08/01	08/08	08/16	08/23	08/30	08/30	
RM -progress		100%	100.00%	100.00%			50.00%					47.5%
SPP -Plan		06/21	07/03	07/19	07/22	08/01	08/09	08/16	08/23	08/30	08/30	
SPP -progress		100%	100.00%				50.00%					17.5%
SPIO -Plan		06/21	07/03	07/24	07/31	08/07	08/14	08/21	08/28	08/30	08/30	
SPIO -progress		100%	100.00%				50.00%					17.5%
SQA -Plan		06/28	07/03	07/26	08/02	08/09	08/16	08/23	08/30	08/30	08/30	
SQA -progress		100%	100.00%	100.00%			50.00%					47.5%
SCM -Plan		06/21	06/28	07/26	08/02	08/09	08/16	08/23	08/30	08/30	08/30	
SCM -progress		100%	100.00%	90.00%			50.00%					44.5%
Level 3												
EM -Plan		06/21	07/03	07/24	07/31	08/07	08/14	08/21	08/28	08/30	08/30	
EM -progress		100%	100.00%				50.00%					17.5%
SPE -Plan		07/03	07/03	07/26	08/02	08/09	08/13	08/16	08/23	08/30	08/30	
SPE -progress		100%	100.00%				50.00%					17.5%
IC -Plan		06/21	07/10	08/01	08/09	08/15	08/20	08/23	08/30	08/30	08/30	
IC -progress		100%	100.00%				50.00%					17.5%
PR -Plan		06/21	07/10	07/24	07/31	08/07	08/14	08/21	08/28	08/30	08/30	
PR -progress		100%	75.00%				50.00%					15.0%
Total Progress %	15	100.0%	93.3%	33.3%	0.0%	0.0%	60.0%	0.0%	0.0%	0.0%	20.0%	27.7%

Weight	PBA Prep	5%	15%	15%	5%	20%	5%	0%	0%	3%	2%	100.0%
Weight	CBA PI/SC E Prep	5%	10%	30%	5%	20%	5%	10%	10%	3%	2%	100.0%

- Worksheet shows breakout of an activity
- updated weekly - input to Activity Summary rate chart

Weights

% complete

Sample Rate Chart

Activity Summary Excerpt - Tabular Data

- Progress fed into Activity Summary weekly
- Composite progress computed for activity

Weights		% complete										Composite Plan and actual %				
% complete		6/7	6/14	6/21	6/28	7/5	7/12	7/19	7/26	8/2	8/9	8/16	8/23	8/30	9/6	
Composite -Planned		0.0%	0.0%	4.0%	9.5%	16.8%	25.0%	36.2%	46.0%	56.2%	68.7%	79.0%	89.7%	100.0%	100.0%	
Composite -Actual		0.0%	0.0%	7.7%	9.2%	15.7%	27.7%	27.7%								
KPA NBS	Wgt	6/7	6/14	6/21	6/28	7/5	7/12	7/19	7/26	8/2	8/9	8/16	8/23	8/30	9/6	
Level2																
RM -planned		0.0%	0.0%	5.0%	15.0%	25.0%	35.0%	45.0%	50.0%	70.0%	75.0%	85.0%	95.0%	100.0%	100.0%	
RM -actual	0.07	0.0%	0.0%	5.0%	13.8%	17.5%	47.5%	47.5%								
SPP -planned		0.0%	0.0%	5.0%	10.0%	15.0%	30.0%	45.0%	50.0%	70.0%	75.0%	85.0%	95.0%	100.0%	100.0%	
SPP -actual	0.07	0.0%	0.0%	5.0%	5.0%	17.5%	17.5%	17.5%								
SPTO -planned		0.0%	0.0%	5.0%	10.0%	15.0%	25.0%	35.0%	45.0%	50.0%	70.0%	75.0%	85.0%	100.0%	100.0%	
SPTO -actual	0.07	0.0%	0.0%	5.0%	5.0%	17.5%	17.5%	17.5%								
SQA -planned		0.0%	0.0%	0.0%	5.0%	15.0%	25.0%	35.0%	45.0%	50.0%	70.0%	75.0%	85.0%	100.0%	100.0%	
SQA -actual	0.07	0.0%	0.0%	0.0%	5.0%	17.5%	47.5%	47.5%								
SCM -planned		0.0%	0.0%	5.0%	15.0%	22.5%	30.0%	37.5%	45.0%	50.0%	70.0%	75.0%	85.0%	100.0%	100.0%	
SCM -actual	0.07	0.0%	0.0%	5.0%	13.8%	17.5%	44.5%	44.5%								
Level3																
ISM -planned		0.0%	0.0%	5.0%	10.0%	15.0%	25.0%	35.0%	45.0%	50.0%	70.0%	75.0%	85.0%	100.0%	100.0%	
ISM -actual	0.07	0.0%	0.0%	5.0%	5.0%	17.5%	17.5%	17.5%								
SPE -planned		0.0%	0.0%	0.0%	0.0%	15.0%	25.0%	35.0%	45.0%	50.0%	70.0%	85.0%	95.0%	100.0%	100.0%	
SPE -actual	0.07	0.0%	0.0%	0.0%	0.0%	22.5%	17.5%	17.5%								

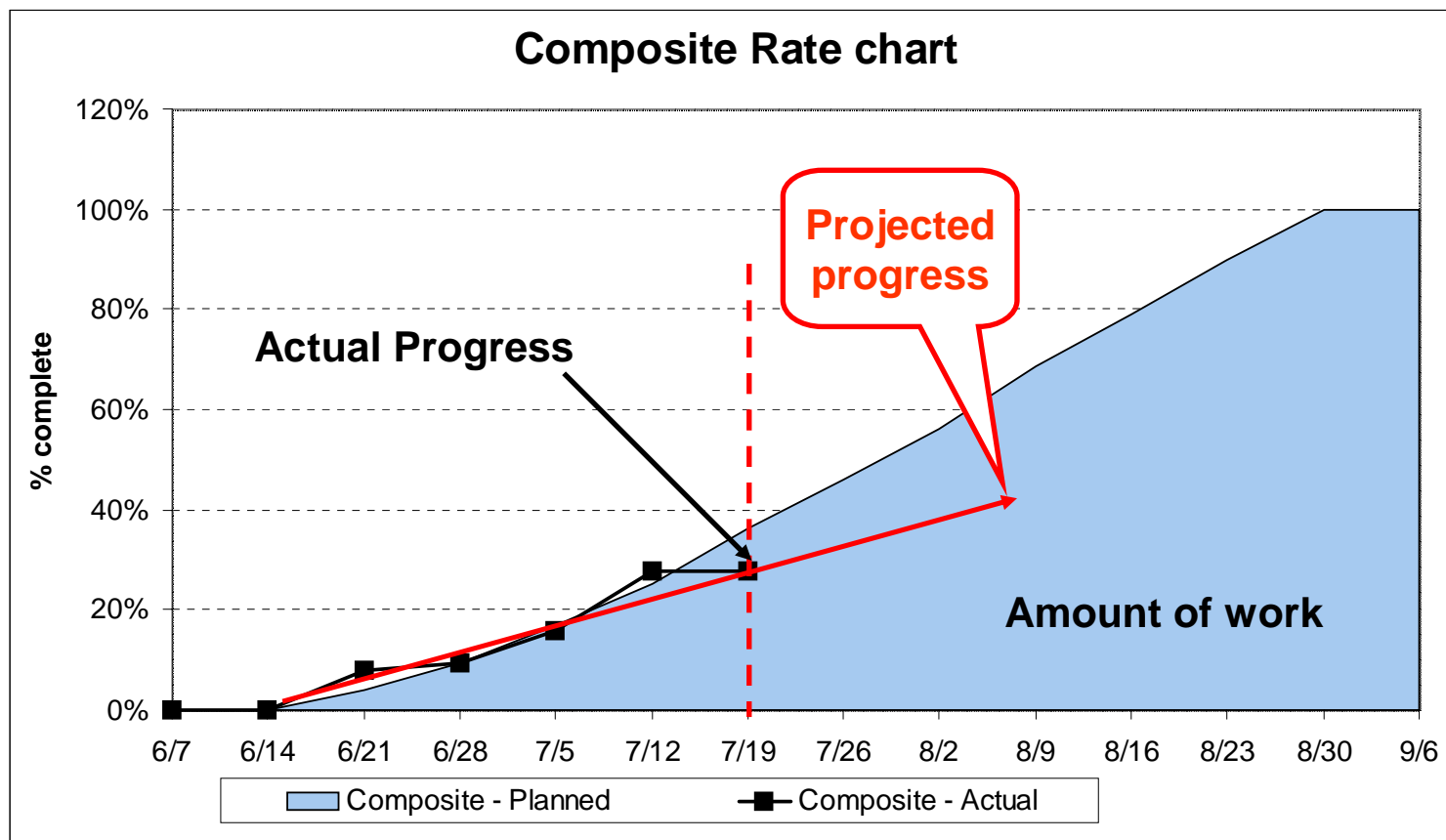
Task behind plan

Task ahead of plan

Sample Rate Chart

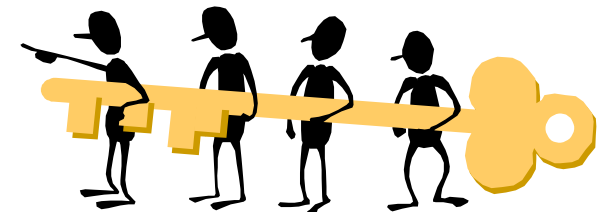
Activity Summary Excerpt - Composite Chart

- Great visual indicator of progress against plan
- Provide leading indicator if progress will be on plan



Key Factors to Organizing Findings into a Manageable PIP

- Collect findings and other input
- Important to map and prioritize process improvement activities to fulfill Business and Engineering Goals
- Systematically analyze and prioritize inputs
- Brainstorm solutions and prioritize
- Develop IMP/IMS and allocate resources (use historical data when available) - scrub
- Develop PIP and obtain senior management approval
- Work with projects and stakeholders, be cognizant of their schedule and demands
- Accountability - manage progress against PIP, period review with senior management





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