I Have Had My CMMI Appraisal… What Do I Do Now? How to Establish a Process Improvement WBS
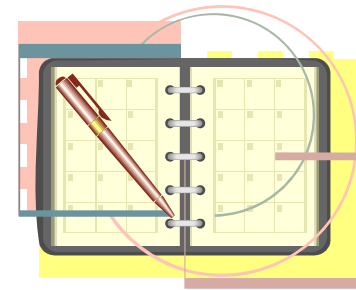
Aldo Dagnino
Director of Manufacturing Solutions

Agenda

- Introduction

- Work Breakdown Structure Characteristics

- Work Packages

- A Practical Example

Problem Statement

- Creating a work breakdown structure (WBS) that will serve as a basis to create a process improvement plan utilizing the Final Findings obtained after a CMMI Appraisal

Assumptions

- A CMMI Appraisal has been recently conducted focusing on specific CMMI process areas (PAs)

- Findings from the appraisal provide details on strengths and weaknesses on the PAs in scope

- Details on weaknesses are actionable

- The Process Improvement team has experience developing plans

CMMI Project Planning Process Area

- ■ SG 1 – Establish Estimates
  - • SP 1.1 - Estimate the Scope of the Project
    - − **Establish a top-level Work Breakdown Structure (WBS) to estimate the scope of the project**
  - • SP 1.2 – Establish Estimates of Work Product and Task Attributes
    - − **Establish and maintain estimates of the attributes of the work products and tasks**
  - • SP 1.3 – Define Project Lifecycle
    - − Define the project life-cycle phases on which to scope the panning effort
  - • SP 1.4 – Determine Estimates of Effort and Cost
    - − **Estimate the project effort and cost for the work products and tasks based on estimation rationale**

# CMMI Project Planning Process Area

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  - SP 1.1 - Estimate the Scope of the Project
    - **Establish a top-level WBS to estimate the scope of the project**
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    - **Estimate the project effort and cost for the work products and tasks based on estimation rationale**

Sub-practices
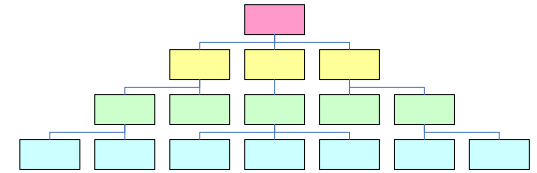
- Develop a Work Breakdown Structure

- Identify work packages to specify tasks, estimates, responsibilities, and schedule

The Work Breakdown Structure – 1 –
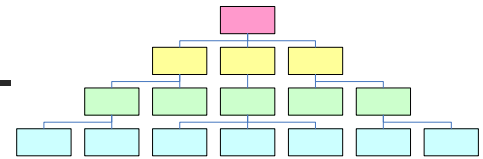
- Serves to identify the work components needed to complete the development project

- It is the basis for size estimates

- The WBS is structured according to the way in which the work will be performed in the project

- The WBS reflects the way the project will be planned and tracked

- The WBS organizes the work into a hierarchical set of work relationships needed to accomplish the objectives of a project

The Work Breakdown Structure – 2 –
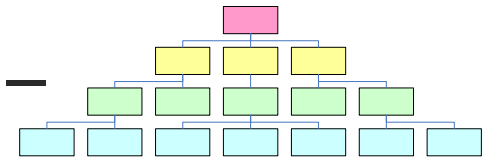
- A top-level WBS serves to structure the initial estimates

- The WBS divides the overall project into an interconnected set of manageable components

- The WBS provides a scheme for identifying and organizing the logical units of work to be managed, which are called "work packages"

- The WBS provides a mechanism for assigning effort, duration, schedule, and responsibility

- The WBS is used as the underlying framework to plan, organize, and control the work done on the project

- The WBS allows to hierarchically organize the project

- The WBS provides a framework to track progress in the project

The Work Breakdown Structure – 3 –
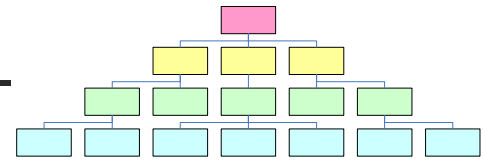
- The WBS allows to identify:
  - Tasks associated with deliverables and supporting activities
  - Tasks for skill and knowledge acquisition
  - Tasks for development
  - Tasks for integration
  - Tasks for management of the project
  - Risks and associated mitigation strategies
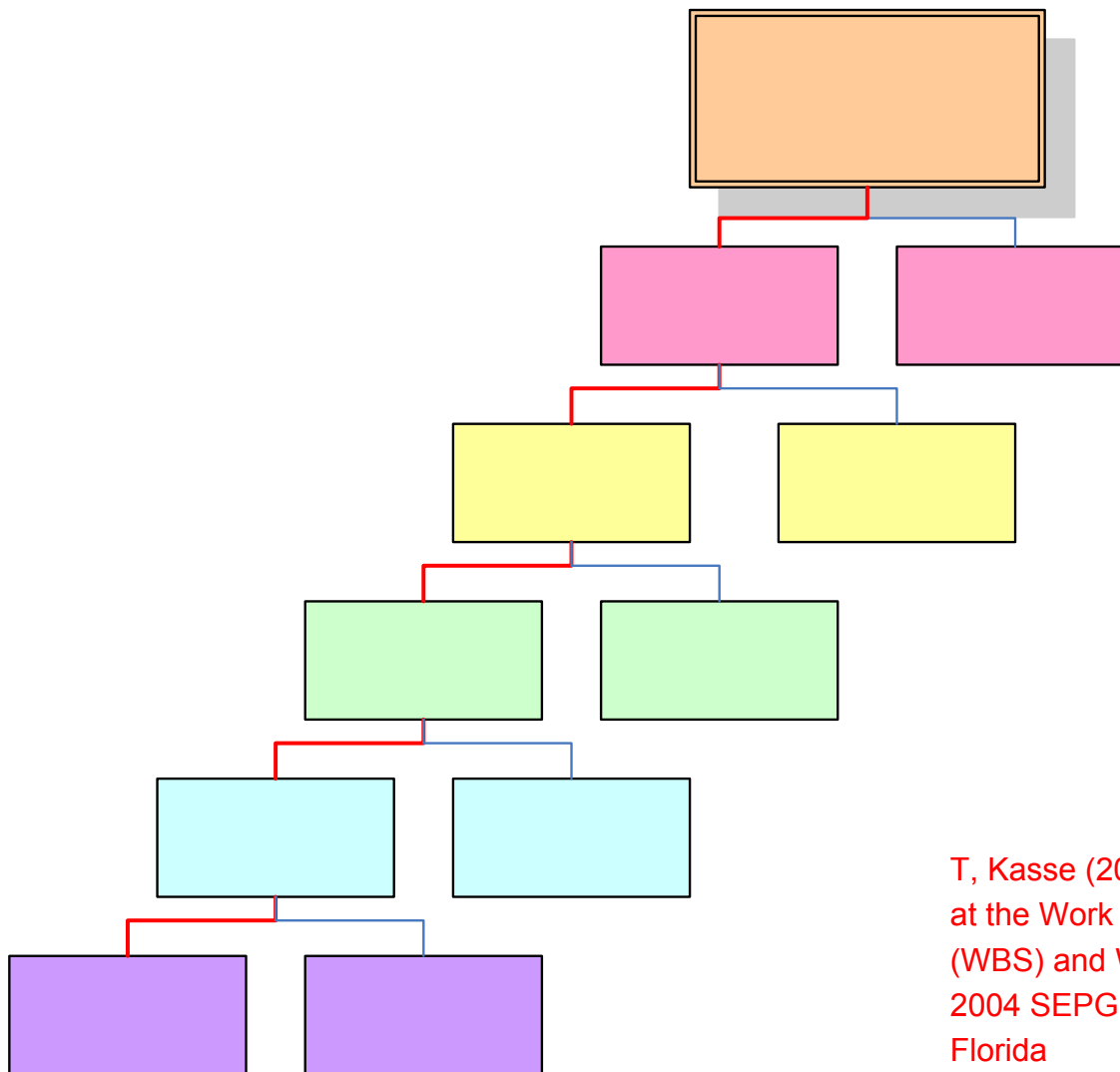
The WBS and Work Packages – 1 –

- The WBS identifies at the lowest level of the tree hierarchy "work packages" (WPs)

- WPs are units of work that can be assigned to a sub-team and can be individually tracked

- WPs is assigned a unique ID to be tracked in the Process Improvement Project Plan

The WBS and Work Packages – 2 –

- **The WBS Contains, at its lowest level, information related to:**
  - The scope of the work to be performed
  - A list of deliverables associated with the work packages
  - A list of required resources to complete the work
  - Required skills and knowledge to complete the work

Six-level WBS Tree Hierarchy

T, Kasse (2004) " A Detailed Look at the Work Breakdown Structure (WBS) and Work Packages", 2004 SEPG Conference in Orlando, Florida

Work Package Template

|	

Project Name

An Example: Geographically Dispersed SW Development at SAS

- Sister development organization in India

- Often remote collaborative software development

- Management of remote development often based on personal relations

- Certain projects require more structured approach to manage remote software development, especially for newly formed groups

Findings CMMI Internal Class B Appraisal – 1 –
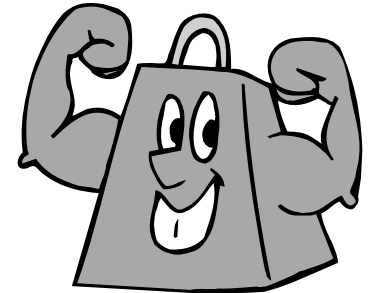
- ▪ Strengths

  - • **Organizational policy to manage external suppliers exist**

  - • **Supplier Agreements for COTS products are developed**

  - • **COTS products are evaluated against requirements**

  - • **Supply Chain Management handles the purchasing of commercial components for HW, SW and contractors**

  - • **Remote sister Development organization uses same RE, CM, and defect tracking tools as Cary team**

Final Findings   – 2 –

- Weaknesses
  - **No organizational policy to manage remote development with sister organizations**
  - **No organizational procedure to manage development activities with sister organizations**
  - **No formal agreements are established with remote development teams in sister organizations**
  - **Transition of work products provided by sister organizations performed in informal manner**
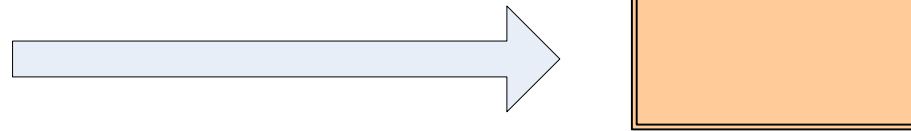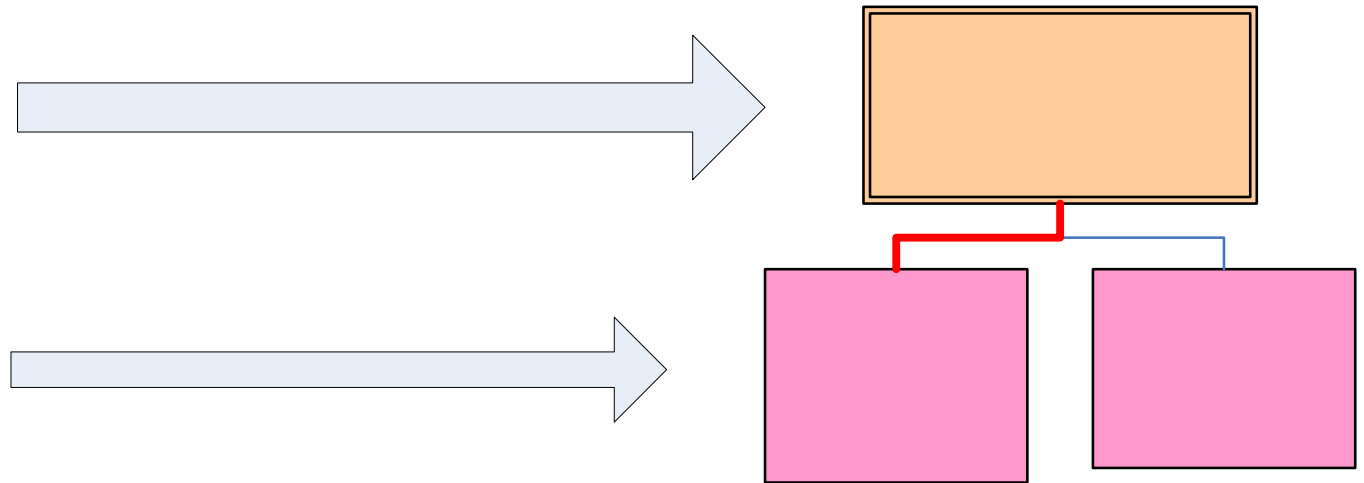
Final Findings   – 3 –
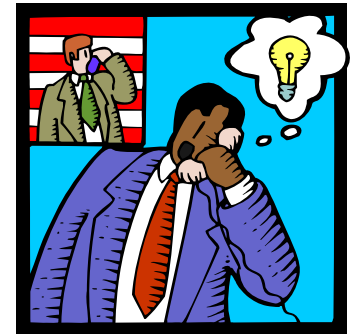
- ■ Recommendations
  - • **Develop SAM Procedure and Process Map for remote development**
  - • **Pilot SAM procedure**
  - • **Integrate R&D SAM and Supply Chain Management procedures**
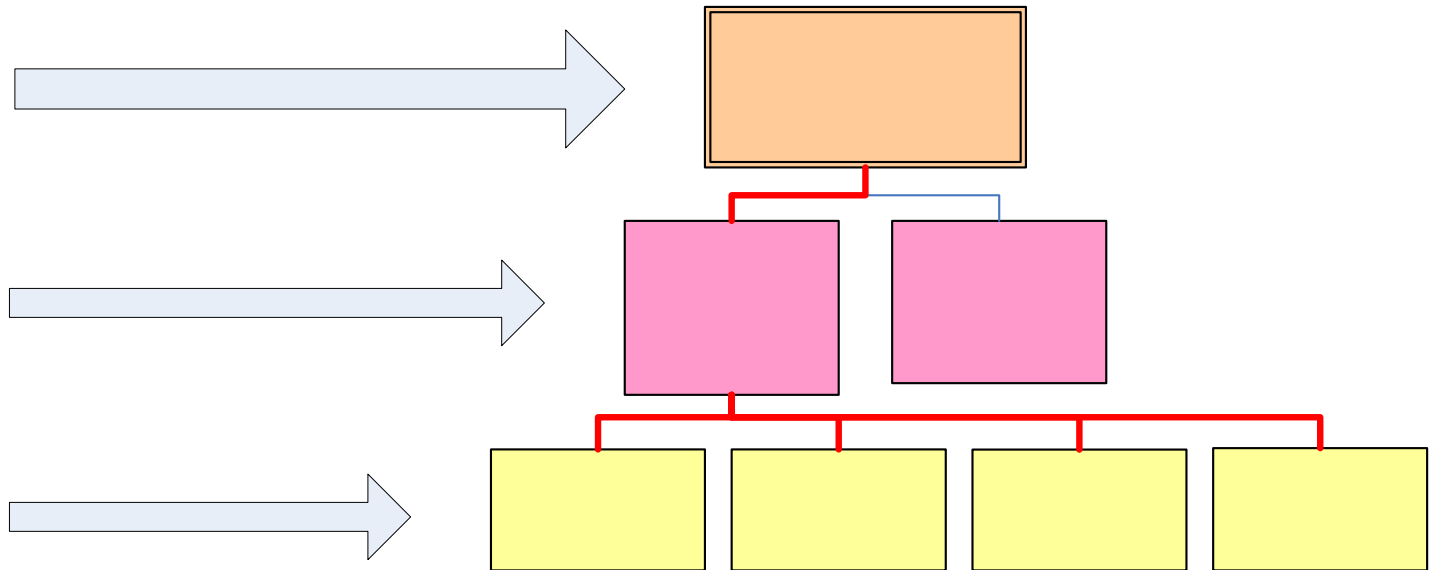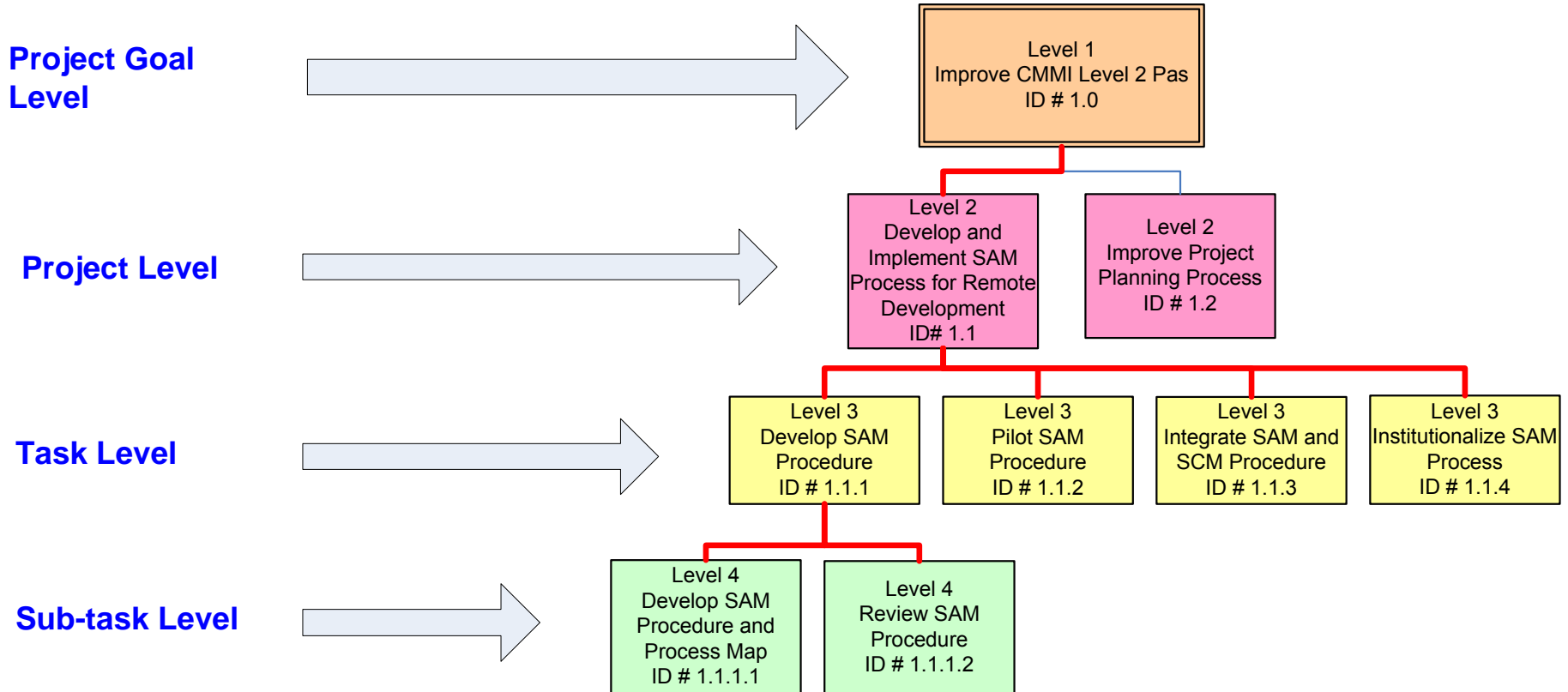 - • **Institutionalize SAM Process**

Project Goal Level WBS

Project Level WBS

Task Level WBS

Sub-task Level WBS

Project Goal Level ➡️

Level 1
Improve CMMI Level 2 Pas
ID # 1.0

Project Level ➡️

Level 2
Develop and Implement SAM Process for Remote Development
ID# 1.1

Level 2
Improve Project Planning Process
ID # 1.2

Task Level ➡️

Level 3
Develop SAM Procedure
ID # 1.1.1

Level 3
Pilot SAM Procedure
ID # 1.1.2

Level 3
Integrate SAM and SCM Procedure
ID # 1.1.3

Level 3
Institutionalize SAM Process
ID # 1.1.4

Sub-task Level ➡️

Level 4
Develop SAM Procedure and Process Map
ID # 1.1.1.1

Level 4
Review SAM Procedure
ID # 1.1.1.2

Work Package Level WBS

Effort Level WBS

Project Goal Level

Work Package and Effort

Project Name	Revision # and Date
Develop and Implement Supplier Management Process for Remote Development Activities	*V 3.1 June 12, 2006*
Work Package Name	**Work Package #**
Brainstorm R&D SAM Procedure	*1.1.1.1.2*

Work Package Description

A group of selected domain experts in managing remote development in the past will brainstorm a viable process to follow in order to better manage remote development activities. An initial process map document will be created as the brainstorming session is carried out. Minutes of the meeting will be taken. The brainstorming session will begin with a presentation of the CMMI SAM PA by the SAM EPG

Deliverable(s)
Deliverable includes a first draft of the SAM process map and minutes of the brainstorming meeting that will be used as input to WP # 1.1.1.1.3

Guidelines for Work
Follow the organizational standards required in the development of new processes in the organization and process maps

People	Skills	Size Estimate	Time Estimate
SAM EPG Lead	CMMI SAM PA and facilitation expertise	2 page process map with medium level of difficulty	8 hours per person
Project Manager 1	Project Mgmt expertise		
Project Manager 2	Project Mgmt expertise		
Development Manager in India	Development expertise		
Development Manager in Cary	Development expertise		
Scribe	Mapping expertise		

WBS in Detail Created by SAM EPG

- **Develop and implement SAM process (policy, procedure, and process map) for remote development**
  - **Develop SAM Procedure and Process Map for remote development**
    - **Design and Develop SAM Procedure and Process Map**
      - **Review Supply Chain Management Policy and Procedure**
      - **Brainstorm among SAM team new R&D SAM procedure**
      - **Document SAM process map**
      - **Document SAM procedure**
    - **Develop few relevant SAM metrics**
      - **Metrics required within the SAM procedure**
      - **Metrics to measure effectiveness of SAM procedure**
    - **Document required SAM templates**
      - **Remote Development Agreement**
      - **Metrics template**
  - **Pilot SAM procedure**
    - **Identify two pilot projects**
    - **Implement pilot projects identified**
    - **Implement pilot SAM metrics**
    - **Monitor pilot projects**
    - **Document lessons learned**
    - **Refine and finalize SAM procedure**
  - **Integrate R&D SAM and Supply Chain Management procedures**
    - **Identify all of the supply chain processes**
    - **Review R&D SAM and SCM processes jointly.**
    - **Identify interface points**
    - **Ensure that SCM representatives participate on the contract management team**
  - **Institutionalize SAM Process**
    - **Develop SAM Policy**
    - **Develop SAM Process training materials**
    - **Train organization relevant stakeholders**
    - **Implement new SAM process in all new development projects**
    - **Monitor SAM process in all projects**
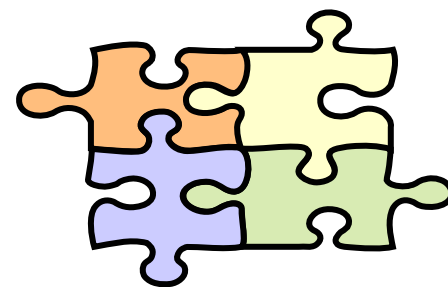
Conclusions

- It is necessary to go deeper than the information typically obtained in the Appraisal Final Findings

- Carry the work breakdown structure tree to the level at which you can define self-contained and measurable tasks that can be assigned to specific individuals or smaller team

- Decide on how you want to track your Process Improvement project

- Make sure you involve the people that are and will be directly involved in the specific process being improved