



# ESTABLISHING THE PERFORMANCE MEASUREMENT BASELINE (PMB)



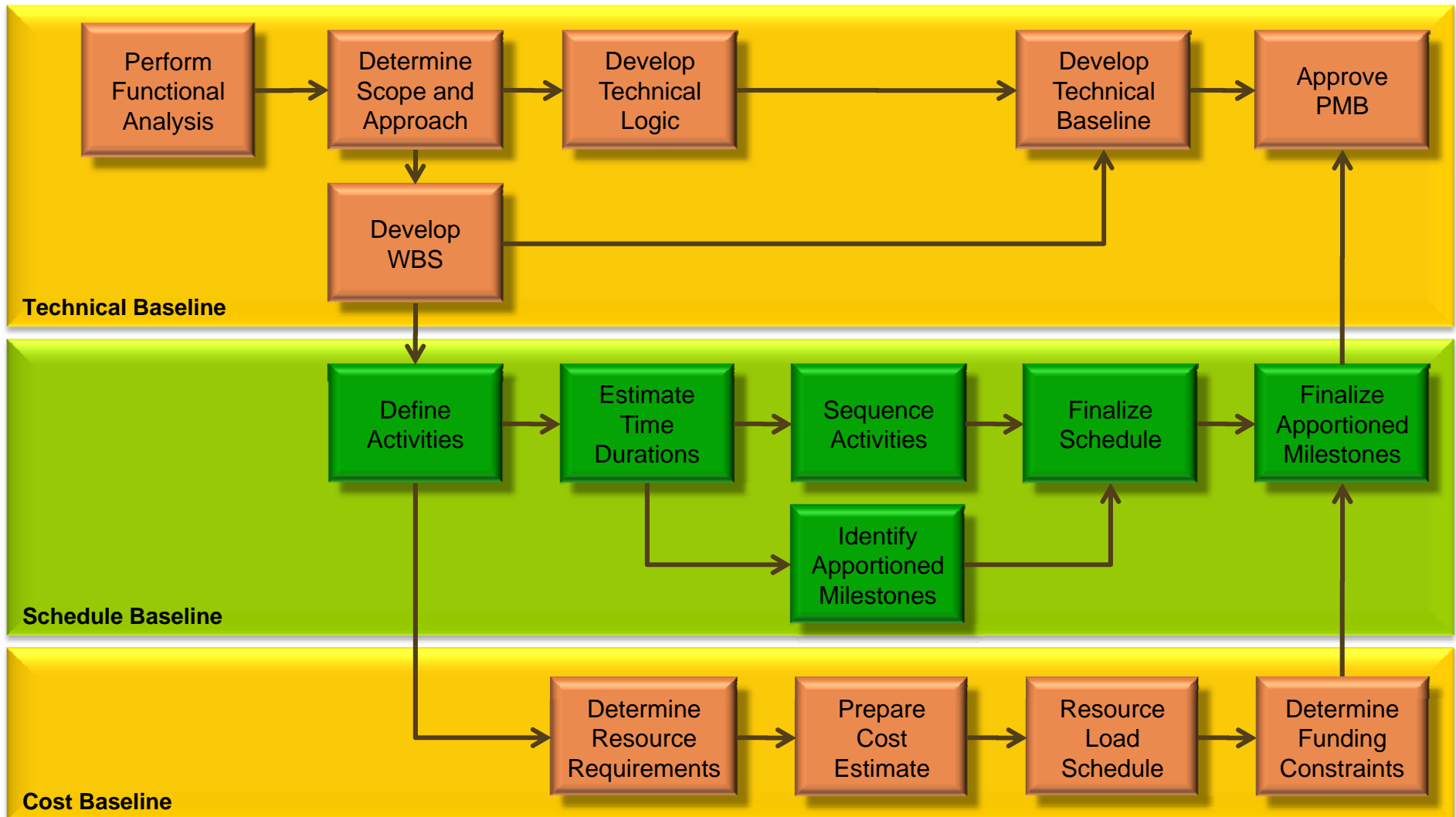
Glen B. Alleman  
Niwotridge Consulting

The Performance Measurement Baseline is a time-phased schedule of all the work to be performed, the budgeted cost for this work, and the organizational elements that produce the deliverables from this work.

# The Performance Measurement Baseline is really 3 baselines – Technical , Schedule, and Cost.

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# The core element of the Performance Measurement Baseline (PMB) ...

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...Is a collection of Work Packages, that define:

- The deliverables that fulfill the needed business capabilities,
- The estimated duration and work effort for each Work Package,
- The resources needed to produce these deliverables within the needed time period, and
- Any dependencies – internal or external – needed to start a Work Package.

It's the deliverables that the customer bought. These deliverables contain the *Business Value* of the project. Connecting the Deliverables with the needed capabilities is the basis of a credible project execution process – then we can answer *Why* we are doing something.

# 6 STEPS TO ESTABLISHING THE PERFORMANCE MEASUREMENT BASELINE



Glen B. Alleman  
Niwotridge Consulting

Building the Performance Measurement Baseline requires six straightforward steps. Each must be performed. Each is critical. Each cannot be skipped.



Never tell people how to do things. Tell them what needs to be done and they will surprise you with their ingenuity. – Gen. George Patton

*I need the capability to disengage from offense activities and move a brigade of 3,000 to 5,000 troops 100 miles in ten hours, and arrive at Bastogne Holland before General Rommel does to rescue the 101<sup>st</sup> Airborne Division*

Capabilities-based planning specifies the outcome but does not specify how to do that cause that outcome to appear.

Action	Outcome
Implement	Strategy
Ensure	Capabilities
Prioritize	Problems And Solutions
Identify	Redundancies
Deliver	Solutions

**3.0 Establish the Performance Measurement Baseline**

Build a time–phased network of schedule activities describing the work to be performed, the budgeted cost for this work, the organizational elements that produce the deliverables, and the performance measures showing this work is proceeding according to plan.

*A Baselined Schedule that Creates the Services or Products to Meet The Requirements*

**3.1 Decompose Scope into Work Packages**

Decompose the Project Scope into a product based Work Breakdown Structure (WBS), then further into Work Packages describing the production of all deliverables traceable to the requirements

**3.2 Assign Responsibility for Deliverables**

Assign Responsibility to Work Packages (the groupings of deliverables) for the named owner accountable for the management of resource allocation and cost baseline and technical delivery

**3.3 Arrange Work Packages in Logical Order**

Arrange the Work Packages in a well formed network with defined deliverables, milestones, internal and external dependencies, appropriate schedule and cost margin.

**3.4 Develop BCWS for Work Packages**

Develop a Time–Phased Budgeted Cost for Work Scheduled (BCWS) from labor and material costs in each Work Package and the Project as a whole. Assure proper resource allocations can be met and budget profiles match expectations of the project sponsor

**3.5 Assign WP Measures of Performance**

Assign object Measure of Performance (MOP) and Measures of Effectiveness (MOE) for each Work Package and summarize these for the Project as a whole

**3.6 Set Performance Measurement Baseline**

Establish a Performance Measurement Baseline (PMB) used to forecast Work Package and Project ongoing and completion cost and schedule metrics

## 3.1 DECOMPOSE THE PROJECT SCOPE INTO WORK PACKAGES EACH WITH A SINGLE DELIVERABLE



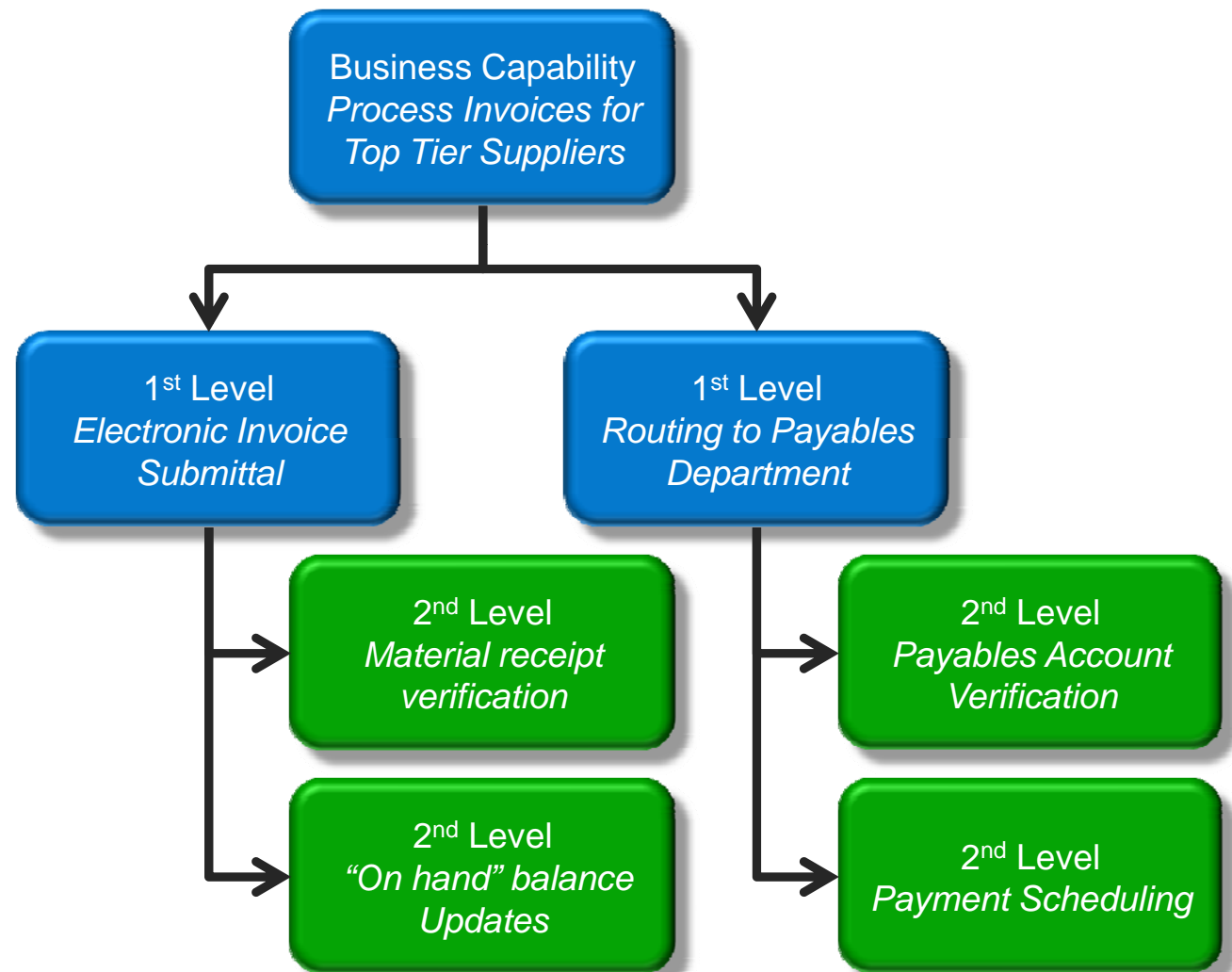
# Business Capabilities, WBS, and Work Packages are connected to define what “Done” look like.

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*There is likely no factor that would contribute more to the success of any project than having a good and complete definition of the project's scope of work*

– Quentin Fleming and Joel Koppelman, *Earned Value Project Management*





# What does a good WBS NOT look like?

The whole notion of spending time building the WBS may seem odd.

How hard can this be?

It turns out of course that any definition of “done” can be traced back to the definitions of “what are we providing to the customer in terms of deliverables?”

That’s the contents of the WBS.

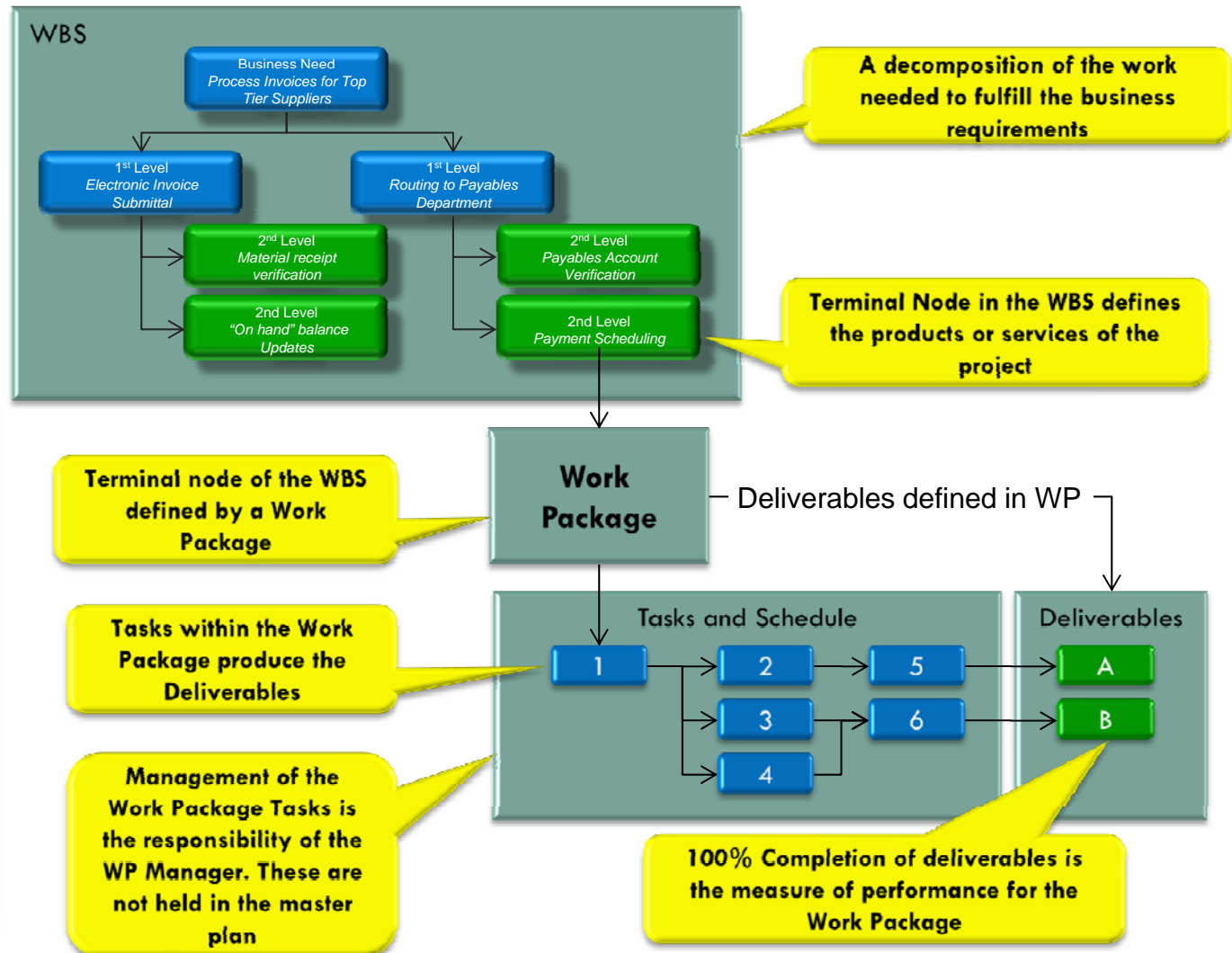
- ❑ It’s not a laundry list of work to be done.
- ❑ It’s not a functional decomposition.
- ❑ It’s not a direct map of the requirements.
- ❑ It’s not a reflection of the underlying software partitioning.
- ❑ It’s not the first structure we might think of, it takes several iterations to get it right.

# Connect the WBS to Work Packages, then define the Tasks for the Deliverables to produce Value.

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The WBS is derived from the breakdown of the business capabilities and their stated requirements. From this WBS Work Packages are defined with their deliverables. The tasks that produce these deliverables are not explicitly stated in the Performance Measurement Baseline, but rather are held by the Work Package Manager. Physical percent complete performance is measured through apportioned milestones or a 0%/100% outcome for the Work Package



# Steps in Building the Work Packages.

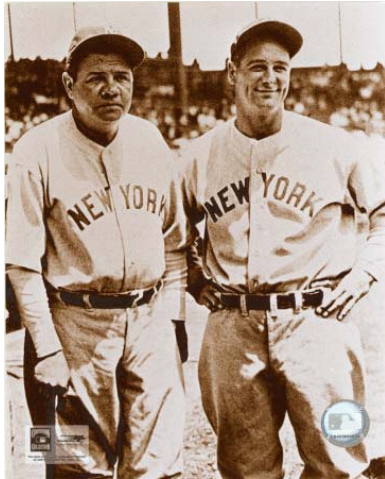
- **Step 1** – define what is going to be delivered to produce business value
  - ▣ One Deliverable produced within a Work Package
  - ▣ Try not to have more than one deliverable per Work Package
- **Step 2** – define the effort and duration along with the confidence levels
  - ▣ Only effort and total duration
  - ▣ Level of confidence for effort and duration

# Naming Work Packages may seem simple, but it's not

## *What's in a Name? Juliet (Romeo and Juliet II, ii 1-2)*

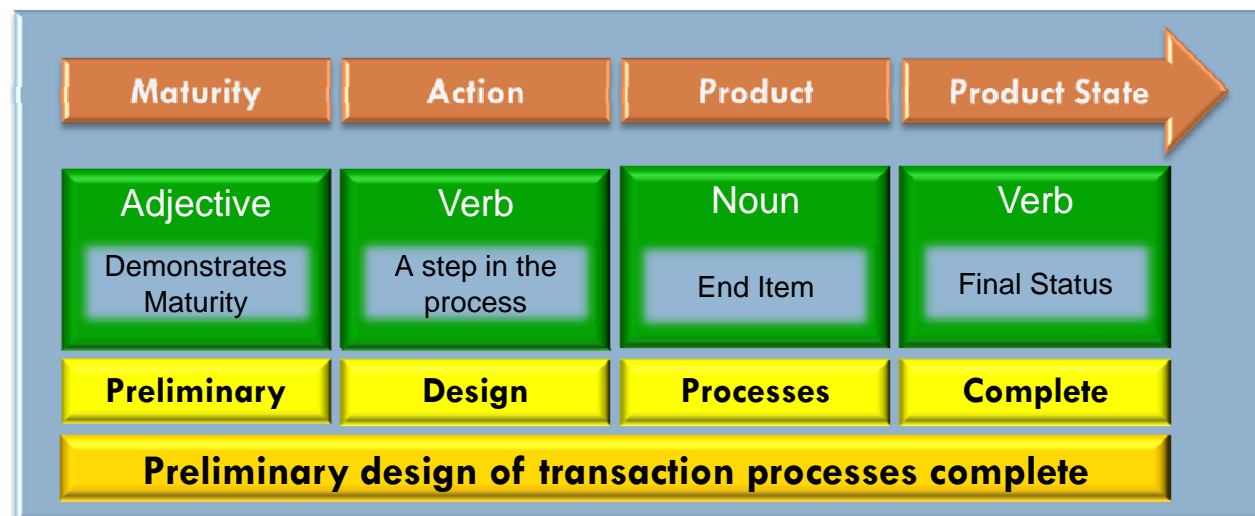
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The Bambino  
and Iron Horse  
Famous names  
that carried  
meaning to the  
reader

- Turns out there is a lot in a name
  - ▣ The name should convey not only the work activities but also the delivered result of these activities
- There is a powerful result from this effort
  - ▣ The project plan and the list of Work Packages is the concise *statement of the work* for the project – all held in a single place – the Project Plan



The Basis of Estimate (BOE) must be recorded, reviewed and approved.

- A short description of how we got to the estimate of effort and the duration of the work
  - ▣ *I've done this before*
  - ▣ *I asked someone who has done this before*
  - ▣ *I ran an experiment to determine how long it would take*
  - ▣ *I took a guess and multiplied it by 2*

Remember we're filling out worksheets for the Work Packages. No project management tools. Resist skipping to the end, until we have some notion of the total effort and duration.

*Committing too soon is just as bad as committing too late*

## Completion Criteria for each Work Packages is used to measure physical progress to Plan.

- ❑ The completion criteria for the Work Package are the Exit Criteria describing the Work Package's 100% complete measures.
- ❑ There is no “partial” completion of the Work Package, no “almost done.”
- ❑ The deliverable may be partially complete, but the Work Package is 0%/100% complete.
- ❑ Either we are done or we are not done – no partial done allowed.

## 3.2 ASSIGN RESPONSIBILITIES



Identify the single person accountable for the Work Package. This person is accountable for the duration, effort, and resource requirements for the Work Package.

## Responsibilities – Actually Accountability for the Work Package is written and visible to everyone.

- Each Work Package has one and only one person *Accountable* for the successful delivery of the Work Package
  - ▣ Put that person's name on the Work Package
- Build a Responsibility Assignment Matrix (RAM) from the HR files for the project team
  - ▣ Naming the person is a start
  - ▣ It's better to start what this person does and how they contribute to the project



## Assign accountability for each component of the Work Package.

- Each Work Package has a single owner who is accountable for:
  - ▣ Defining the deliverables
  - ▣ Assigning resources
  - ▣ Balancing the resource usage
  - ▣ Defining the Earned Value measurement criteria
  - ▣ Identifying any apportioned milestones
  - ▣ Reporting physical percent complete
- Name this person in the Work Package and the Master Schedule

## 3.3 ARRANGE WORK PACKAGES WITHIN EACH WORKSTREAM



## Identify the Predecessors and Successors between Work Packages to sequence the work effort.

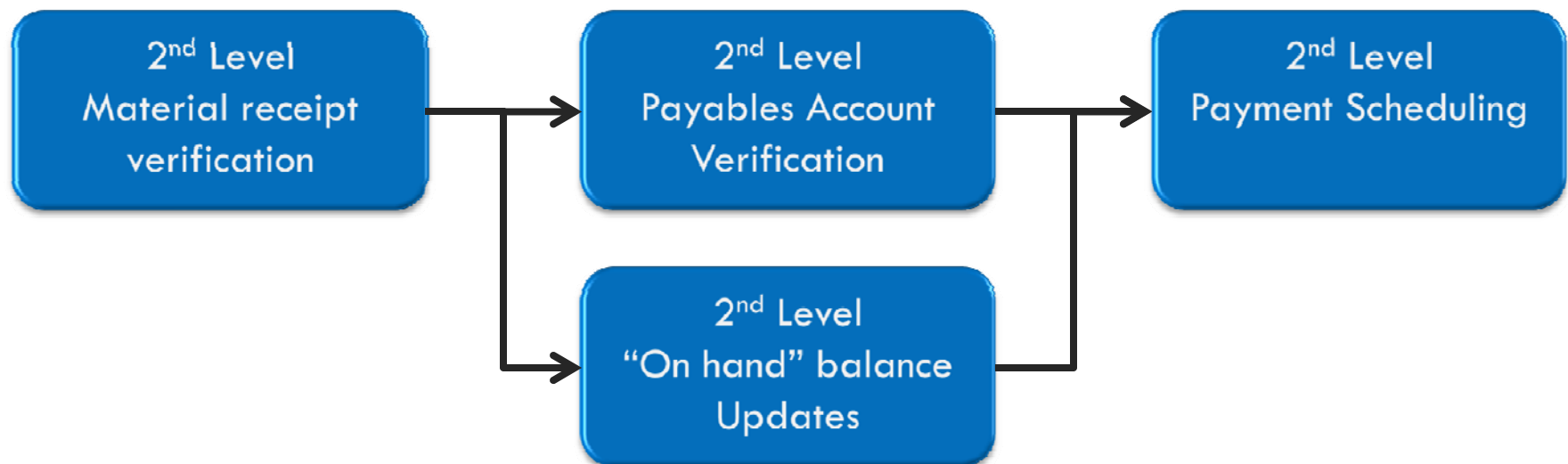
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- Give some thought about the sequence of the Work Packages
  - ▣ What deliverables come first?
  - ▣ What deliverables come next?
- The reason for this should be obvious
- Use a *Work Authorization* (WA) processes to keep the sequence of work intact

Lay out the Work Packages on the wall. Move then around to see how they flow. Stand back is see if the arrangement actually makes any sense in terms of the flow of work and the production of deliverables

Arrange the Work Packages in the sequence that ensures value is being produced along the way.



# “Arranging” the Work Packages Is An Iterative And Incremental Process

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"Any intelligent fool can make things bigger, more complex, and more violent. It takes a touch of genius—and a lot of courage—to move in the opposite direction." ~Albert Einstein

In this example, the Work Package Managers collectively come to an agreement on how the sequence of how the work will be performed. The result is a collective ownership of the outcome. This ownership comes from the collective development of the project plan. This process is a Product Development Kaizen (PDK)

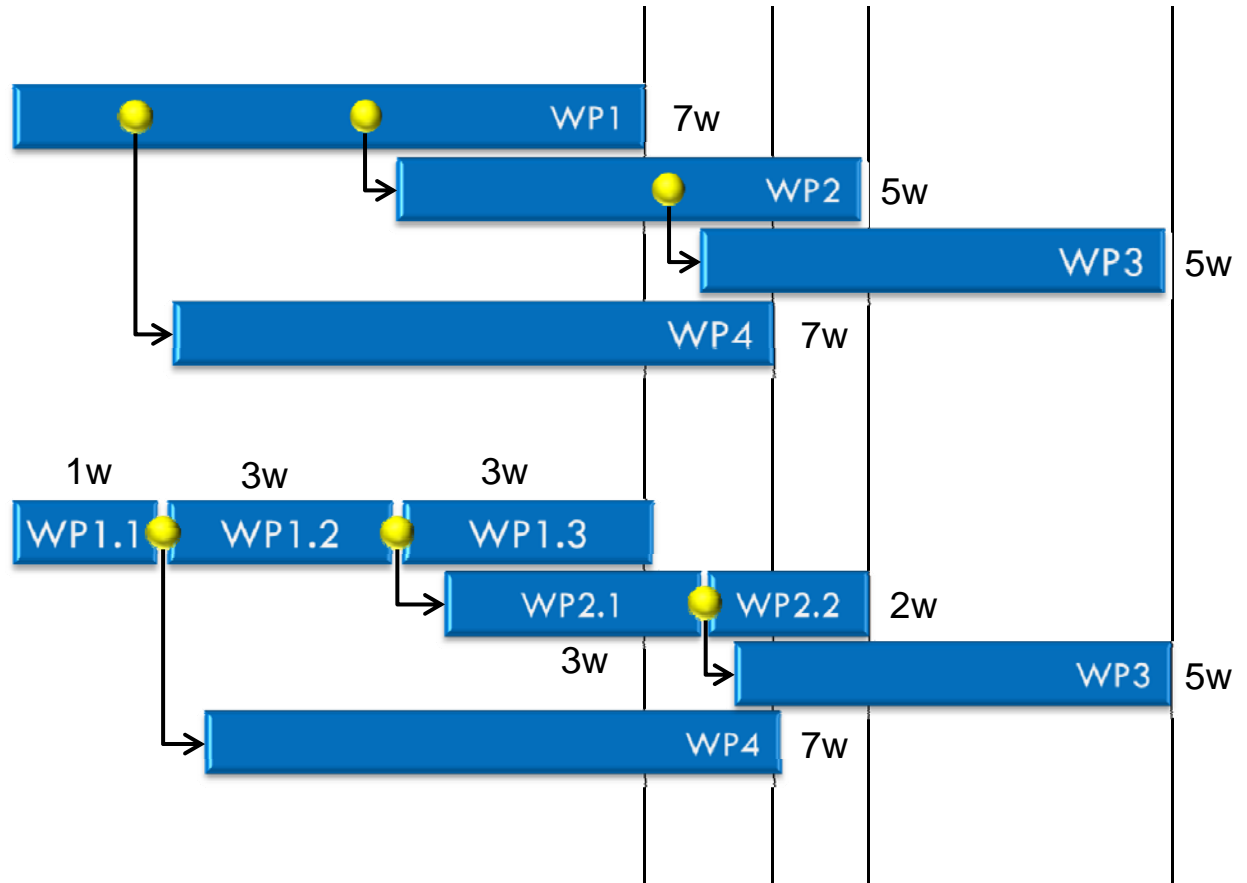
# Start with a “notional” arrangement of the “Bundles” of work within a Workstream

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## □ WPs should have No intermediate connections

- The first approach is to have long running WPs with negative or positive lags to maintain sequencing



- A better approach is to break the WP into separate deliverables and sequence Finish to Start

## 3.4 DEVELOP THE BUDGET FOR THE WORK SCHEDULED IN EACH WORKSTREAM

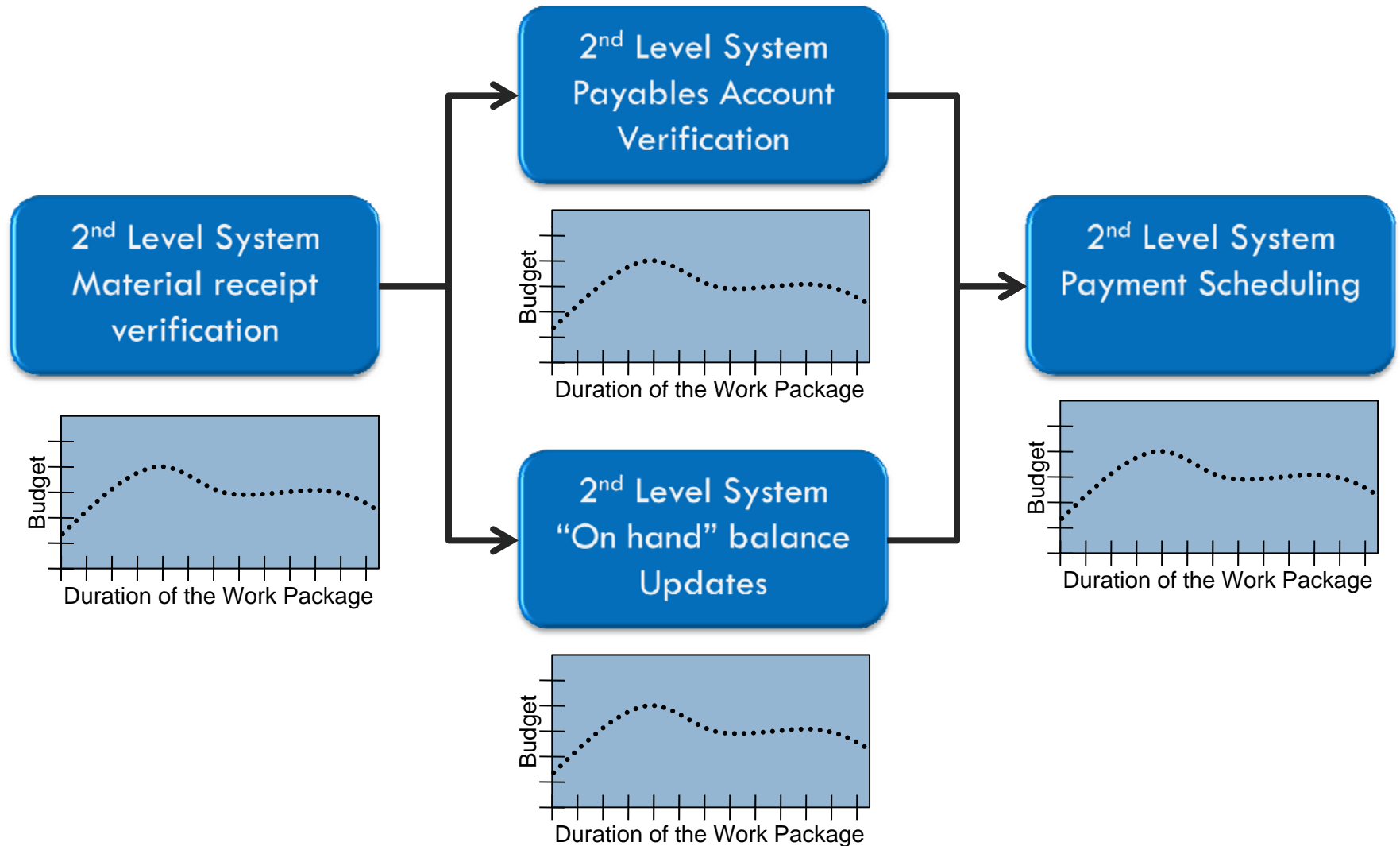


Using the individual Work Package cost spreads, the project or project budget spreads are developed to match the available resources.

# Develop a time-phased budget from the network of Work Packages based on resource loads

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## 3.5 ASSIGN PERFORMANCE MEASURES



Glen B. Alleman  
Niwotridge Consulting

The only programmatic performance measure of a Work Package is *Physical Percent Complete* (PPC). This can be defined in a variety of ways. But expended effort is NEVER the way to define progress.

# Identify objective measures of performance for each Work Package

- Define the Planned Value for each Work Package completion or apportioned milestone within a Work Package
- Only *Physical Percent Complete* should be used to measure progress – no “opinions” of progress
- Answer the question
  - ▣ *How are we going to recognize that progress is being made*
  - ▣ *The passage of time and consumption of resources is NEVER a measure of progress*

## 3.6 SET PERFORMANCE BASELINE



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With the Work Packages sequenced, labor spreads assigned and balanced, deliverables defined, and performance measures established, it's time to baseline the plan.

## Baseline the schedule to establish the planned budget spreads for each Work Package

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- Baselining the Performance Measurement Baseline is the first step in successfully of *Executing* the project plan
- Without the baseline and the rigorous change control over this baseline, the needed credible performance predictions will be not possible

There are two phases of any complex project:  
***Too early to tell and too late to stop***

- Mr. Blaise Durante, Senior Executive Service, Deputy Assistant Secretary for Acquisition Integration, Office of the Assistant Secretary of the Air Force for Acquisition, Washington, D.C.

# BUILDING THE PROJECT SCHEDULE FROM THE BASELINE WORK PACKAGES



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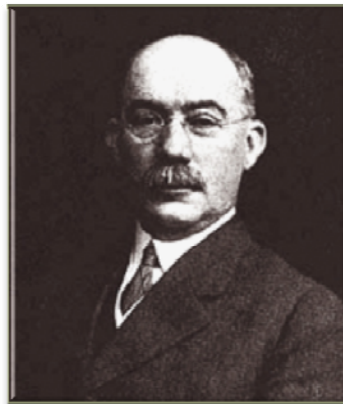
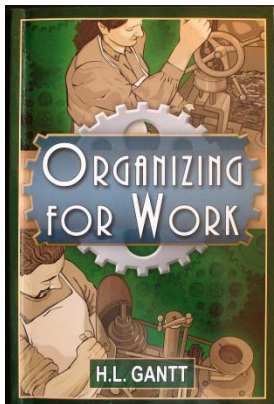
With the baselined sequence of Work Packages, the detailed execution schedule can be started. This is an iterative and incremental process that balances the resources against needed business capabilities.

# Assembling the Work Packages into credible project schedule, starting with

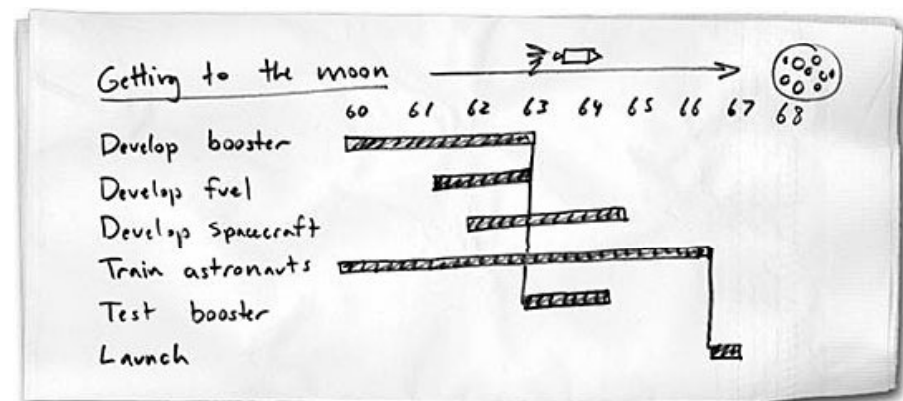
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- ❑ Total Work Package duration
- ❑ Total Work Package work effort
- ❑ Start dates aligned with the project start date defined in the Project menu
- ❑ The result is a Gantt-style picture of the flow of Work Package value



Henry Laurence Gantt, A.B., M.E., 1861–1919



## Sequencing the Work Packages starts with finding the best value flow for the work effort

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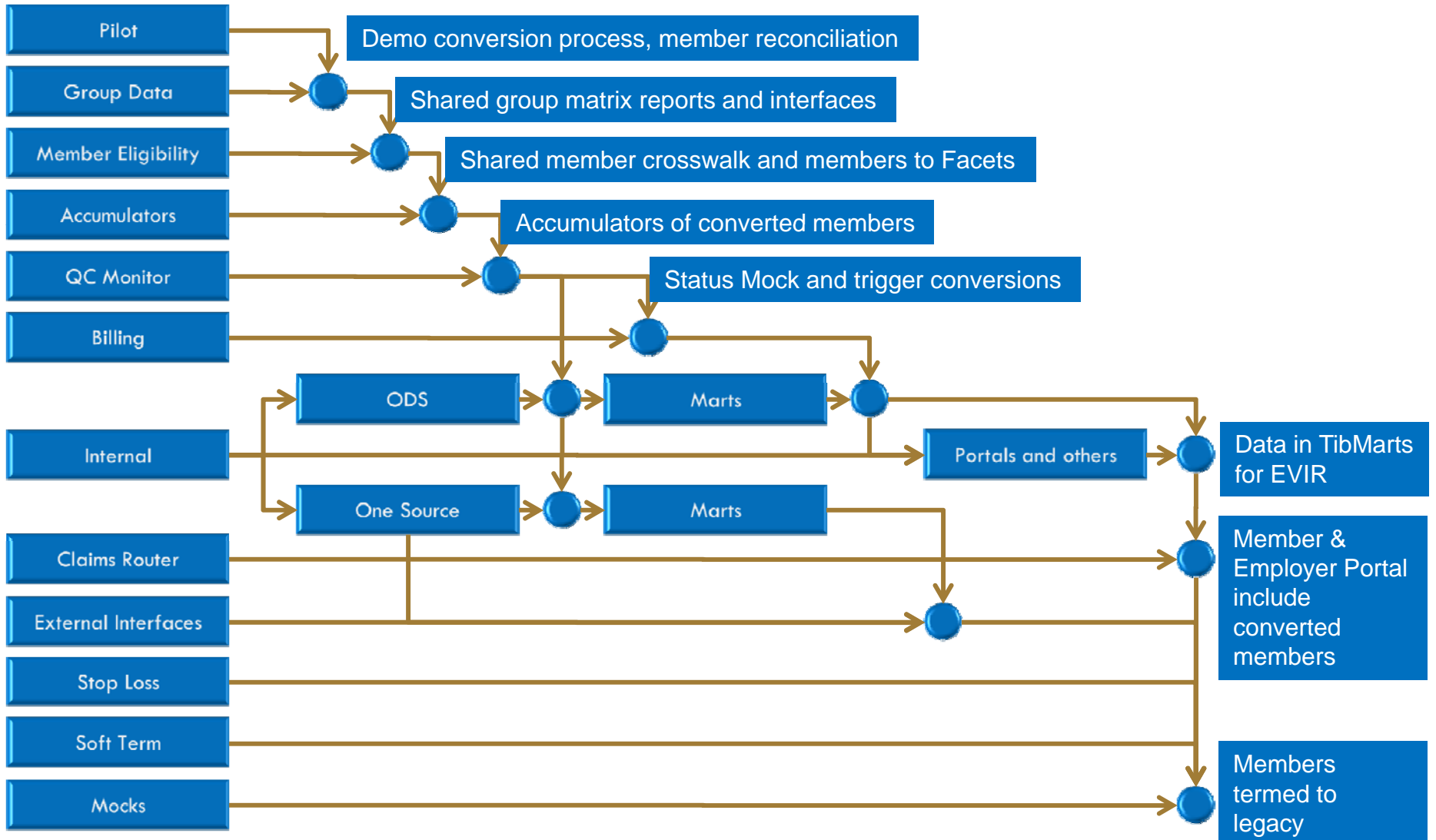
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- Confirm the Total Effort and Total Duration of each Work Package represents the agreed on information captured from the team
- One of two approaches comes next:
  - ▣ Sequence the individual WP's into a logical network – then assign resources
  - ▣ Assign resources – then sequence the WP's into a logical network

# Project maturity flow for work streams defines in the increasing maturity of the deliverables

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# MAKING THE SCHEDULE CREDIBLE



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Niwotridge Consulting

A credible schedule cannot be just a list of activities. It must be an accurate model of the project strategy and execution that can be analyzed, assessed, and used to answer risk based questions.

# Analyzing and assessing the network of Work Packages to assess credibility

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- ❑ Critical Path
- ❑ Accuracy
- ❑ Integration
- ❑ Realism
- ❑ Performance
- ❑ Variances
- ❑ Forecasting
- ❑ What-if's
- ❑ Risk
- ❑ Resources



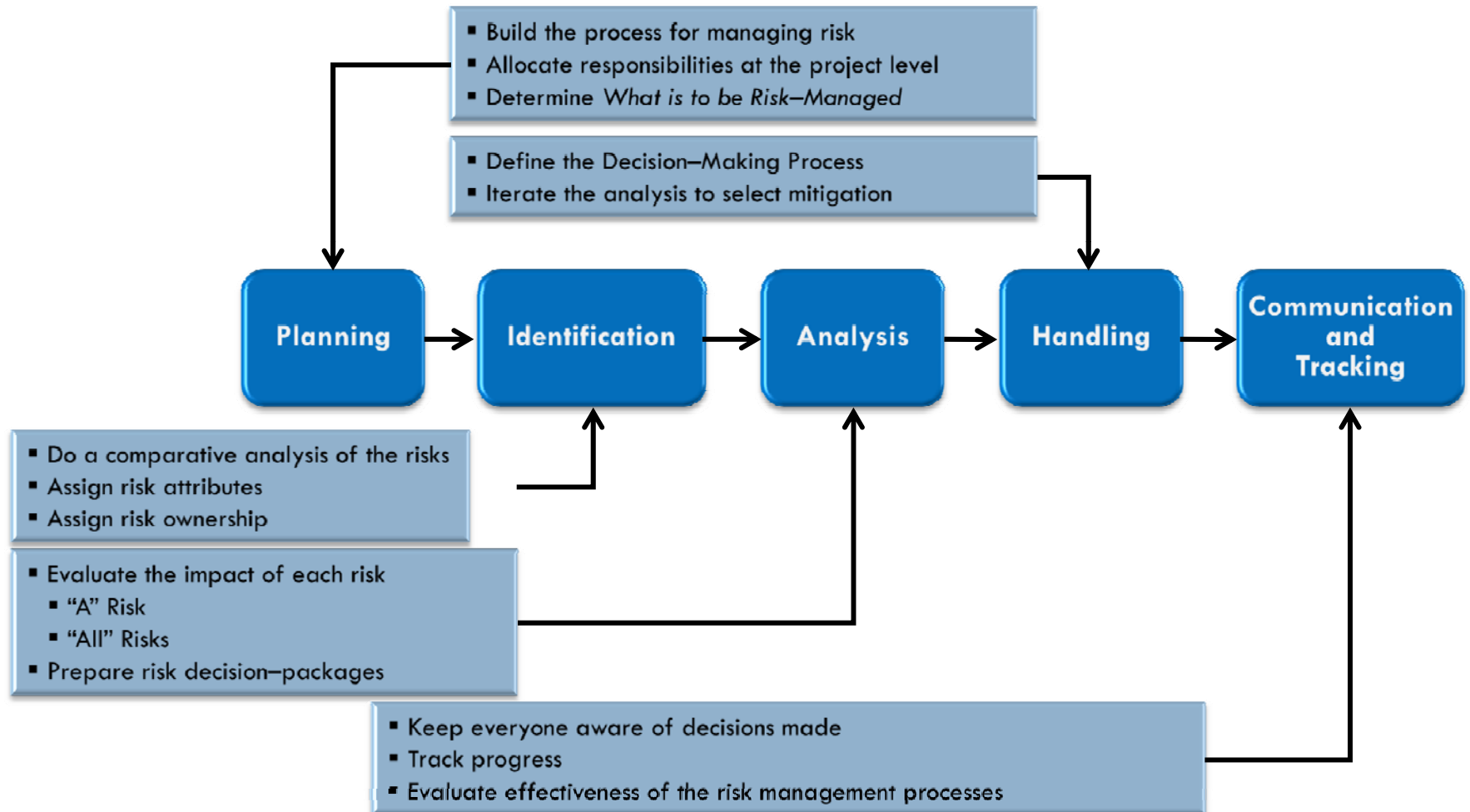
I Que Es La Veritat? = What is Truth?

Over the portal of the "Sagrada Familia" church in Barcelona, Spain

# Risk Management Process is a starting point for a credible Performance Measurement Baseline

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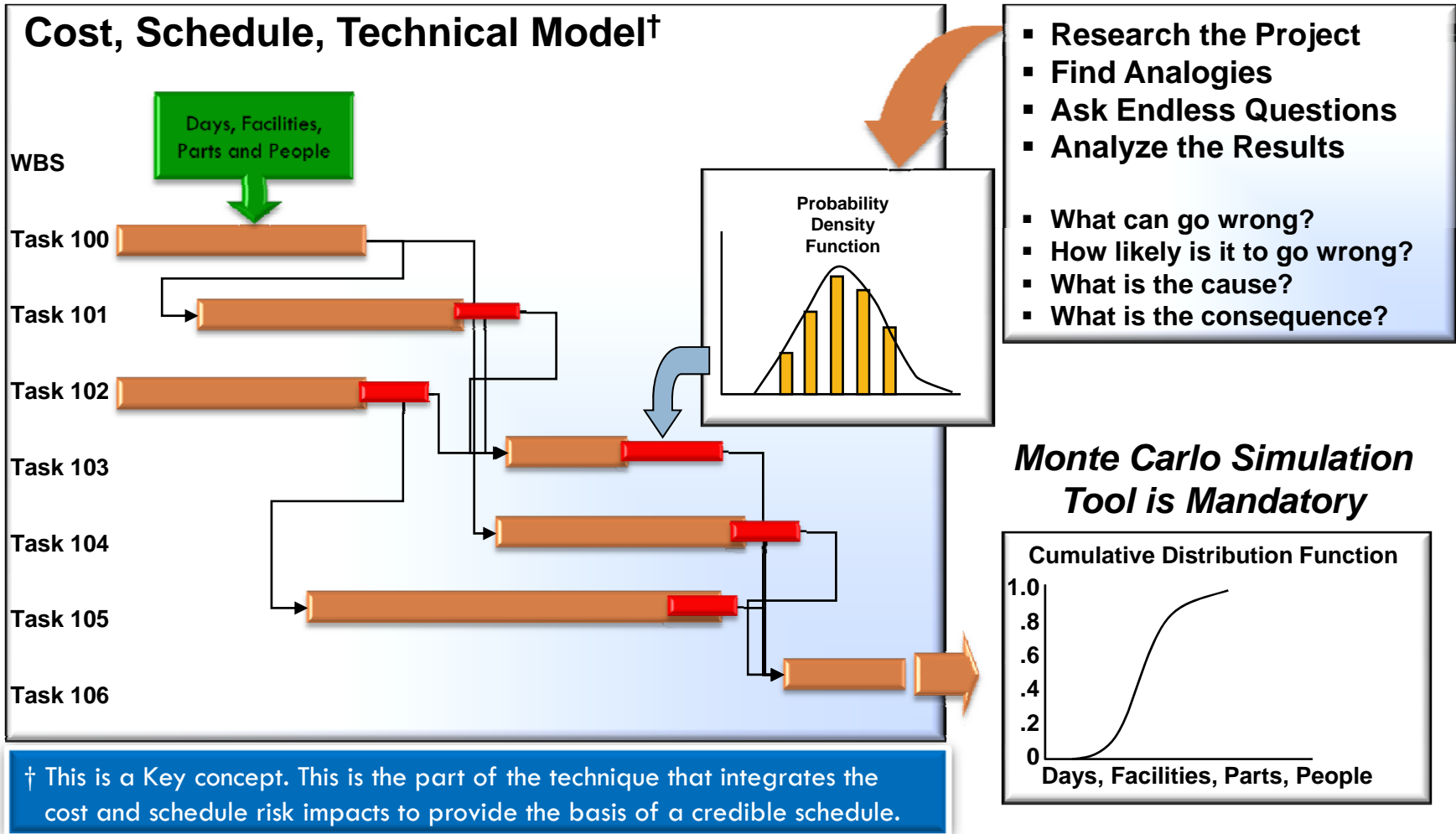


"Risk Analysis Techniques, Schedule, Cost and Other Aspects, INCOSE Heartland Chapter October 24, 2001, Futon Corporation

# Cost, Schedule and Technical Risk Model are inseparable – anything else is a Ponzi Scheme

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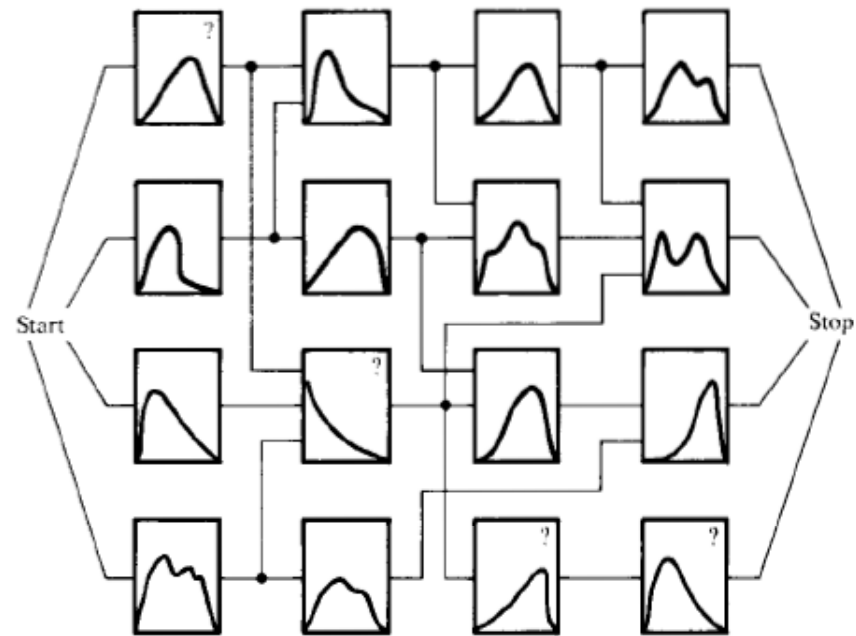


# Assessment of the probabilistic duration is the basis of any credible schedule

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- Any path could be critical depending on the arrangement of the underlying task completion time probability distribution functions
- The independence or dependency of each task with others in the network, greatly influences the outcome of the total project duration
- Understanding this dependence is critical to assessing the credibility of the plan as well as the total completion time of that plan



*Prepare for the unknown by studying how others in the past have coped with the unforeseen and the unpredictable – General, George S. Patton*

# WRAPPING UP FOR TODAY

*THIS OF COURSE IS JUST THE  
TIP OF THE ICEBERG*



Glen B. Alleman  
Niwotridge Consulting

There is a tremendous amount of information in this Work Shop. No one single session can move it from here into practice. In the end programmatic control of a project is a *practice* not a *procedure*.

In the end, its all about the schedule. We can find more money, but we can never find more time.

- ❑ A slipping the schedule is simply unacceptable in any project with business value
- ❑ “Attack” the schedule as soon as possible and never stop attacking
- ❑ Update schedules frequently, look at it daily
- ❑ Keep all the data “clean” and use it to make management decisions

*How long are we willing to wait before we find out we're late?  
Measure progress and update our forecast at  $\frac{1}{2}$  that time. More frequently for critical items.*

