

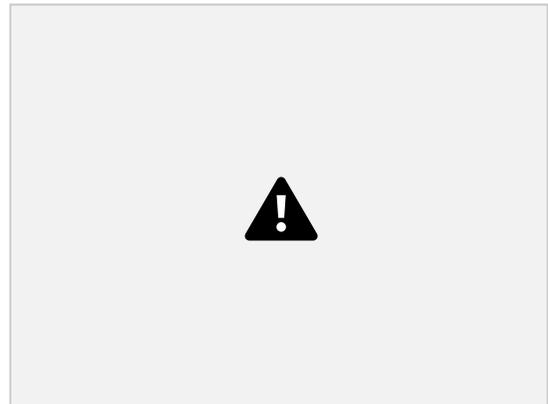
Five Immutable Principles of Project Success 2022

PRINCIPLES ARE THE BASIS OF PRACTICES AND PROCESS OF PROJECT SUCCESS

Successfully managing any project, Capital projects, Software Intensive System of Systems projects, or home garden – project success starts with Five Immutable Principles of success, listed to the right.

These five principles of project success are stated as questions that must be answered in units of measure meaningful to the decision makers:

1. Do we know what **Done** looks like in units of measure meaningful to the decision maker?
2. Do we have of **Plan** to reach **Done** on time, on budget, with a technical solution that delivers capabilities to satisfy the customer’s needs? 3. Do we have the **Resources** needed to execute this Plan. Time, money, staff, facilities, capacity for work needed to reach the destination?
4. Have we identified the **Impediments** to our progress along the way to **Done**? Have we defined how we are going to remove, avoid, or handle these impediments at the proper time? 5. Do we have some way to measure our **Progress to Plan**, in units of measure meaningful to the decision makers? Reaching the needed Effectiveness, Performance, Key Parameters, for the planned cost?



Each Principle is supported by Practices, Processes, and the Data they produce shown below that provide actionable information to the decision makers.

<p>1. Identify Capabilities needed to achieve the project objective or an end state for a specific scenario to accomplish a mission or business outcome.</p>	<ul style="list-style-type: none"> ▪ Define capabilities as Operational concepts ▪ Define capabilities with scenarios or Use Cases ▪ Assess needs, Cost, and Risk of the Capabilities simultaneously ▪ Define explicit, balanced, and feasible alternatives.
<p>2. Elicit Technical and Operational requirements needed for the capabilities to be fulfilled in the order that maximizes business value.</p>	<ul style="list-style-type: none"> ▪ Perform fact finding ▪ Gather and classify requirements ▪ Evaluate and rationalize requirements ▪ Prioritize requirements ▪ Integrate and validate requirements
<p>3. Establish a Performance Measurement Baseline – a time phased network of work activities – the produces project deliverables for the planned cost.</p>	<ul style="list-style-type: none"> ▪ Decompose scope into small Work Packages ▪ Assign responsibility for deliverables from the Work Packages ▪ Develop the budget for the Work Packages ▪ Assign Work Package Measures of Performance and Effectiveness ▪ Set the performance measurement baseline
<p>4. Execute the Performance Measurement Baseline while assuring planned technical and operational performance is met.</p>	<ul style="list-style-type: none"> ▪ Perform the authorized work in the planned order ▪ Accumulate and report work package performance ▪ Analyze work package performance ▪ Take corrective management action

5. Apply Continuous Risk Management to programmatic and technical risks with risk handling processes to reduce, remove, or prevent impacts on the project's probability of success.

- Identify risks
- Analyze risks
- Plan risk response
- Track risk management activities
- Control or accept risks

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① IDENTIFY NEEDED CAPABILITIES

Identifying System Capabilities is the starting point for any successful project. The System Capabilities are not direct requirements, but statements of what *abilities* the system must provide when it is complete. ¹ Here's what some Capabilities sound like:

- We need the capability to remove 1½ hours from our supply chain ordering process once the merger of our two firms is complete.
- We need the capability to change the Wide Field Camera and the internal nickel hydride batteries, while doing no harm to the telescope.
- We need the capability to dock four oil tankers at the pier and unload their cargo in 18 hours, while operating the ground transportation system concurrently.
- We need the capability to control the Hell Fire Missile with a new touch panel while maintaining existing navigation and guidance capabilities in the helicopter.

How are these capabilities delivered? What are the technical and operational requirements needed to implement each capability? We may not know yet, but a Capabilities Based Plan identifies program needs, allocated resources, and tracks activities and outcomes. The critical reason for starting with capabilities is to establish a home for all the requirements. To answer the question *why is this requirement present? Why is this requirement needed? What business or mission value does fulfilling this requirement provide?*

Capabilities statements define units for measuring project progress to plan. Measuring progress with physical percent complete at each level is mandatory. But measuring how the Capabilities are being fulfilled is most meaningful to the customer with Measures of Effectiveness and Measures of Performance. The *meaningful to the customer* unit of measures are critical to the success of any project. Without these measures, the project may be a cost, schedule, and technical success, but fail to fulfill the mission.

Without defining the needed capabilities, it is not clear the mission will be a success, because there is no clear and concise description of what *Done* looks like. Success means providing the needed capabilities, on or near schedule and cost.

The paradigm of Capabilities Based Planning recognizes the interdependence of systems, strategy, organization, and support in delivering the capability, and the need to examine options and trade-offs in terms of performance, cost



and risk to identify optimum development investments.

Capabilities Based Planning relies on Use Cases and Scenarios to provide the context to measure the level of maturity for each capability.

¹ Capabilities Based Planning, <http://www.rand.org/topics/capabilities-based-planning.html>

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② ESTABLISH TECHNICAL AND OPERATIONAL REQUIREMENTS BASELINE

Poorly formed requirements have been shown to contribute as much as 25% to the failure modes of programs and projects. ²

Requirements are the defined attributes for an item prior to the start of the work to develop a design for that item. System requirements analysis is a structured, organized, methodology for identifying an appropriate set of resources to satisfy a system need (the needed capabilities) and the requirements for those resources to provide a sound basis for the design or selection of those resources. Requirements act as the transformation between the customer's capabilities needs and the design concept implemented by the organization's engineering resources. ³

The requirements engineering process decomposes a statement of the customer need through a systematic exposition of what that system must do to satisfy that need. This need is the ultimate system requirement from which all other requirements and designs flow. There are two fundamental classes of requirements.

- **Process Performance Requirements** – define how the work processes are used to produce a beneficial outcome to the customer.
- **Product Performance Requirements** – define the product specifications and how they are related to the process requirements. ⁴



Most requirements methods focus on specification. It is better to focus on elicitation and with fact-finding, classification, evaluation and rationalization, prioritization, and integration and validation of the requirements. These baseline requirements define the Work Packages and Planning Packages and the work efforts needed to produce the deliverables from the project. These deliverables fulfill the needed technical and operational capabilities to the customer.

² *The Requirements Engineering Handbook*, Ralph R. Young, Artech House

³ "Issues with Requirements Elicitation," Michael G. Christel and Kyo C. Kang, Technical Report, CMU/SEI-92-TR-12, Software Engineering Institute, Carnegie Mellon University Pittsburgh, Pennsylvania 15213.

⁴ *System Requirements Practices*, Jeffery O. Grady, McGraw Hill, 1993

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③ ESTABLISH PERFORMANCE MEASUREMENT BASELINE

The Performance Measurement Baseline (PMB) is the primary assessment document for assuring the credibility of the project plan. The PMB is the baseline of the cost, schedule and deliverables for each Work Package in the plan.

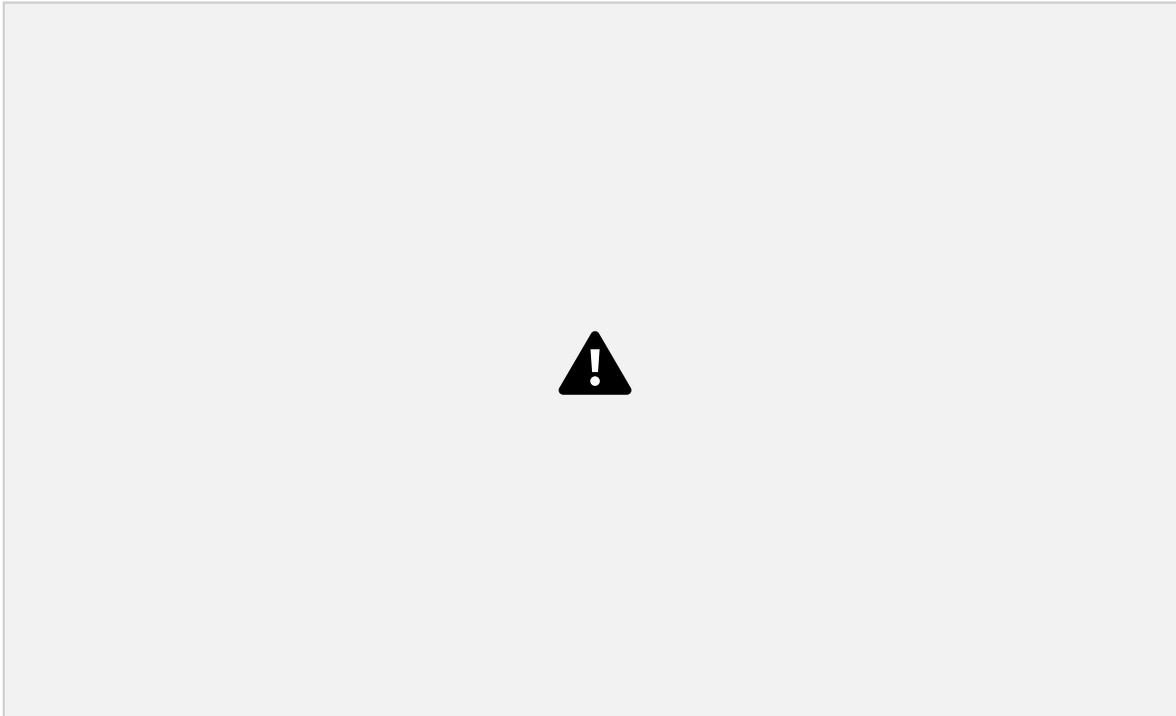
Constructing the PMB requires knowledge of the business and technical requirements, skill in developing the Work Packages that produce the deliverables for these requirements, and discipline in assembling the cost, schedule and relationships between the Work Packages. This discipline requires the most focus for the planners and project controls staff. Without this discipline, the development of a credible PMB is not possible.

The PMB is where the Measures of Effectiveness and Measures of Performance are defined to assess progress to plan. These are units of measure meaningful to the decision makers for each deliverable:

- Deliverables are what the customer has paid money for.
- Deliverables contain the business or technical capabilities, the associated value that fulfill the requirements of the business plan.

The critical success factor in building the PMB is the decomposition of the system requirements into technical capabilities, then into deliverables that enable those technical capabilities, and finally into the Work Packages that produce those deliverables. Defining the decomposed deliverables from the needed system capabilities in a Work Breakdown Structure. This decomposition process must be iterative and incremental. Assessment of the validity of this decomposition requires thought. The first decomposition is likely not the best approach.

A credible Plan and Schedule for the delivery of the needed capabilities *on time* and *on budget* have three baselines – technical, schedule, and cost:



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④ EXECUTE THE PERFORMANCE MEASUREMENT BASELINE

With the Performance Measurement Baseline established in step ③, the proper execution becomes critically important.

The execution process is the *project rhythm*. this means the processes are performed in a repeated manner – at least on a monthly basis. This business rhythm creates actionable information for the project manager on a time scale that allows corrective actions to be taken to stay on schedule, on budget, and assure technical compliance

These tangible, physical deliverables, are defined in the Work Packages created during the Planning process. No matter the duration of the assessment of performance a measure of physical percent complete is mandatory if the project manager is to receive actionable information. The measures of physical percent complete can be applied on weekly boundaries in a variety of ways:

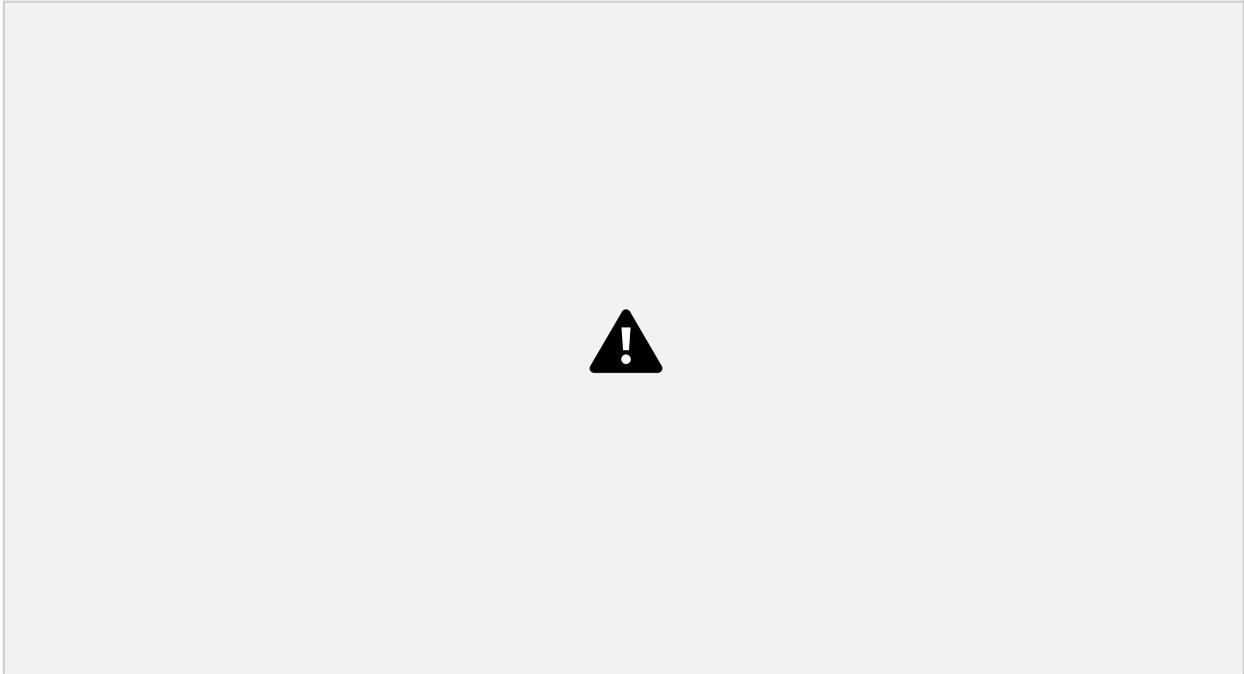
- Have short duration tangible deliverables.
- Have apportioned milestones to measure progress to plan from the deliverables. ▪ Have

tasks short deliverable cycle and record 0%/100% complete at the end of each week.

This approach provides the answer to the question:

How Long Are We Willing To Wait Before We Find Out We Are Late?

The answer must be *short enough to take corrective action to stay on plan*. In all cases, a measure of physical percent complete is mandatory if the project manager is to receive actionable information to stay on plan. The important process here is to have an agreed on measure of performance that is defined before the work starts.



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⑤ PERFORM CONTINUOUS RISK MANAGEMENT

Continuous Risk Management provides tangible benefits to increase the probability of project success:

- Prevent problems before they occur, by identifying and dealing with them early.
- Improve quality, by focusing on project objectives and consciously looking for activities that effect quality throughout the project lifecycle.
 - Enable better use of resources, for early identification of potential problems.



Risk Management Activities and their Outcomes	
Identify Risks	<ul style="list-style-type: none">▪ Identify and classify risks in a Risk Register.▪ Manage this Risk Register through a Risk Management Board.▪ Connect these risks and their handling in the Master Schedule.
Analyze Risks	<ul style="list-style-type: none">▪ Convert risk data into risk decision–making information.▪ Use this analysis information as the decision basis for the project manager to work on the “right” risks.
Plan Risk Response	<ul style="list-style-type: none">▪ Turn risk information into decisions and actions (both present and future).▪ Develop actions to address individual risks, prioritize risk actions, and create an integrated risk management plan.
Track Risk Management Activities	<ul style="list-style-type: none">▪ Monitor the status of risks and actions taken to ameliorate risks.▪ Identify and monitor risks to enable the evaluation of the status of risks themselves and of risk mitigation plans.
Control Or Accept Risk	<ul style="list-style-type: none">▪ Risk communication lies at the center of the model to emphasize both its pervasiveness and its criticality.▪ Without effective communication, no risk management approach can be viable.