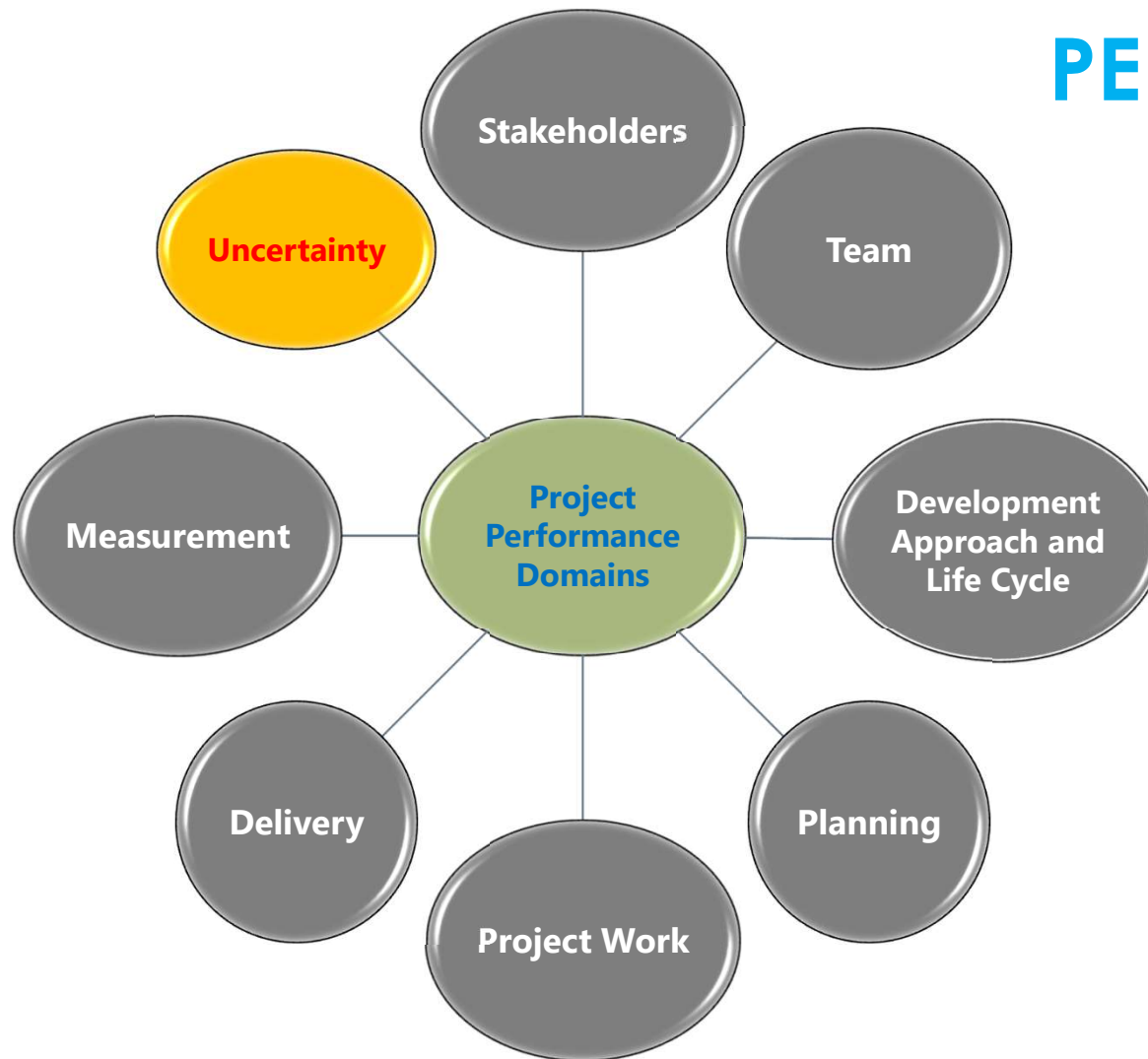


# UNCERTAINTY

## PERFORMANCE DOMAIN



# PROJECT PERFORMANCE DOMAINS



# UNCERTAINTY PERFORMANCE DOMAIN

## UNCERTAINTY PERFORMANCE DOMAIN

The uncertainty performance domain addresses activities and functions associated with risk and uncertainty.

Effective execution of this performance domain results in the following desired outcomes.

- An awareness of the environment in which projects occur, including, but not limited to, the technical, social, political, market, and economic environments.
- Proactively exploring and responding to uncertainty.
- An awareness of the interdependence of multiple variables on the project.
- The capacity to anticipate threats and opportunities and understand the consequences of issues.
- Project delivery with little or no negative impact from unforeseen events or conditions.
- Opportunities are realized to improve project performance and outcomes.
- Cost and schedule reserves are utilized effectively to maintain alignment with project objectives.

# UNCERTAINTY PERFORMANCE DOMAIN

The following definitions are relevant to the Development Approach and Life Cycle Performance Domain:

**Uncertainty.** A lack of understanding and awareness of issues, events, paths to follow, or solutions to pursue.

**Ambiguity.** A state of being unclear, having difficulty in identifying the cause of events, or having multiple options from which to choose.

**Complexity.** A characteristic of a program or project or its environment that is difficult to manage due to human behavior, system behavior, and ambiguity.

**Volatility.** The possibility for rapid and unpredictable change.

**Risk.** An uncertain event or condition that, if it occurs, has a positive or negative effect on one or more project objectives.

This performance domain addresses the various aspects of uncertainty, implications of uncertainty, such as project risk, as well as options for navigating the various forms of uncertainty.

# UNCERTAINTY PERFORMANCE DOMAIN

Uncertainty in the broadest sense is a state of not knowing or unpredictability. There are many nuances to uncertainty, such as:



**Risk** associated with not knowing future events,



**Ambiguity** associated with not being aware of current or future conditions, and



**Complexity** associated with dynamic systems having unpredictable outcomes.

# UNCERTAINTY PERFORMANCE DOMAIN

Successfully navigating uncertainty begins with understanding the larger environment within which the project is operating. Aspects of the environment that contribute to project uncertainty include, but are not limited to:



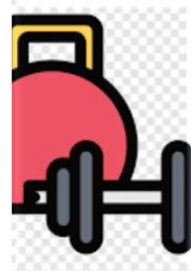
**Economic factors** such as volatility in prices, availability of resources, ability to borrow funds, and inflation/deflation;



**Technical considerations** such as new or emerging technology, complexity associated with systems, and interfaces;



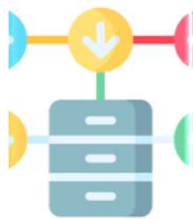
**Legal or legislative** constraints or requirements;



**Physical environment** as it pertains to safety, weather, and working conditions;

# UNCERTAINTY PERFORMANCE DOMAIN

Successfully navigating uncertainty begins with understanding the larger environment within which the project is operating. Aspects of the environment that contribute to project uncertainty include, but are not limited to:



**Ambiguity** associated with current or future conditions;



**Social** and market influences shaped by opinion and media; and



**Political** influences, either external or internal to the organization.

# GENERAL UNCERTAINTY

Uncertainty is inherent in all projects. For this reason, the effects of any activity cannot be predicted precisely, and a range of outcomes can occur. Potential outcomes that benefit the project objectives are known as opportunities; potential outcomes that have a negative effect on objectives are called threats. Together, the set of opportunities and threats comprise the set of project risks. There are several options for responding to uncertainty;

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**Gather information.** Sometimes uncertainty can be reduced by finding out more information, such as conducting research, engaging experts, or performing a market analysis. It is also important to recognize when further information collection and analysis exceed and benefit of having the additional information.

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**Prepare for multiple outcomes.** In situations where there are only a few possible outcomes from an area of uncertainty, the project team can prepare for each of those outcomes. This entails having a primary solution available, as well as having backup or contingency plans in case the initial solution available, as well as having backup or contingency plans in case the initial solution is not viable or effective.

# GENERAL UNCERTAINTY

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**Set based design.** Multiple designs or alternatives can be investigated early in the project to reduce uncertainty. This allows the project team to look at trade-offs, such as time versus cost, quality versus cost, risk versus schedule, or schedule versus quality. The intention is to explore options so the project team can learn from working with various alternatives. Ineffective or suboptimal alternatives are discarded throughout the process.

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**Build in resilience.** Resilience is the ability to adapt and respond quickly to unexpected changes. Resilience applies to both project team members and organizational processes. If the initial approach to product design or a prototype is not effective, the project team and the organization need to be able to learn, adapt, and respond quickly.

# AMBIGUITY

There are two categories of ambiguity:

- **Conceptual Ambiguity** and
- **Situational Ambiguity.**

**Conceptual Ambiguity** – the lack of effective understanding – occurs when people use similar terms or arguments in different ways. For example, the statement, “The schedule was reported on track last week,” is not clear. It isn’t clear whether the schedule was on track last week or whether it was reported on last week. In addition, there could be some question as to what “on track” means. Ambiguity of this type can be reduced by formally establishing common rules and definitions of terms, such as what does “on track” mean.

**Situational Ambiguity** surfaces when more than one outcome is possible. Having multiple options to solve a problem is a form of situational ambiguity. Solutions for exploration of ambiguity include progressive elaboration, experimentation, and the use of prototypes.

# AMBIGUITY



**Progressive elaboration.** This is the iterative process of increasing the level of detail in a project management plan as greater amounts of information and more accurate estimates become available.



**Experiments.** A well designed series of experiments can help identify cause and effect relationships or, at least, can reduce the amount of ambiguity.



**Prototypes.** Prototypes can help distinguish the relationship between different variables.

# COMPLEXITY - System Based

Complexity is a characteristic of a program, project, or its environment, which is difficult to manage due to human behavior, system behavior; or ambiguity. Complexity exists when there are many interconnected influences that behave and interact in diverse ways.

Examples of working with complexity that is systems based include:

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**Decoupling.** Decoupling entails disconnecting parts of the system to both simplify the system and reduce the number of connected variables. Determining how a piece of a system works on its own reduces the overall size of the problem.

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**Simulation.** There may be similar though unrelated scenarios that can be used to simulate components of a system. A project to build a new airport that includes an area with shopping and restaurants can learn about consumer buying habits by seeking out analogous information on shopping malls and entertainment establishments

# COMPLEXITY - Reraming

Examples of working with complexity that entail *reframing* are:

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**Diversity.** Complex systems require viewing the system from diverse perspectives. This can include brainstorming with the project team to open up divergent ways of seeing the system. It can also include Delphi-like processes to move from divergent to convergent thinking.

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**Balance.** Balancing the type of data used rather than only using forecasting data or data that report on the past or lagging indicators provides a broader perspective. This can include using elements whose variations are likely to counteract each other's potential negative effects.

# COMPLEXITY – Process Based

Examples of working with complexity that is process based include:

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**Iterate.** Build iteratively or incrementally. Add features one at a time. After each iteration, identify what worked, what did not work, customer reaction, and what the project team learned.

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**Engage.** Build in opportunities to get stakeholder engagement. This reduces the number of assumptions and builds learning and engagement into the process.

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**Fail safe.** For elements of a system that are critical, build in redundancy or elements that can provide a graceful degradation of functionality in the event of a critical component failure.

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# VOLATILITY

Volatility exists in an environment that is subject to rapid and unpredictable change. Volatility can occur when there are ongoing fluctuations in available skill sets or materials. Volatility usually impacts cost and schedule. Alternatives analysis and use of cost or schedule reserve address volatility.

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**Alternatives analysis.** Finding and evaluating alternatives, such as looking at different ways to meet an objective, such as using a different mix of skills, resequencing work, or outsourcing work. Alternatives analysis may include identifying the variables to be considered in evaluating options, and the relative importance or weight of each variable.

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**Reserve.** Cost reserve can be used to cover budget overruns due to price volatility. In some circumstances, schedule reserve can be used to address delays due to volatility associated with resource availability.

# RISK

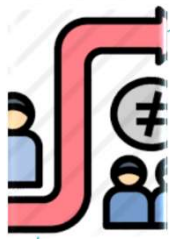
Risks are an aspect of uncertainty. A risk is an uncertain event or condition that, if it occurs, has a positive or negative effect on one or more project objectives. Negative risks are called threats, and positive risks are called opportunities. All projects have risks since they are unique undertakings with varying degrees of uncertainty.

## Overall Project Risk

Overall project risk is the effect of uncertainty on the project as a whole, arising from all sources of uncertainty. This includes individual risks and the exposure to the implications of variation in project outcome, both positive and negative. Overall risk is often a function of complexity, ambiguity, and volatility. Responses to overall project risk are the same as for individual threats and opportunities, though responses are applied to the overall project rather than to a specific event. If the overall risk on the project is too high, the organization may choose to cancel the project.

# RISK - Threats

A threat is an event or condition that, if it occurs, has a negative impact on one or more objectives. Five alternative strategies may be considered for dealing with threats, as follows:



**Avoid.** Threat avoidance is when the project team acts to eliminate the threat or protect the project from its impact.



**Escalate.** Escalation is appropriate when the project team or the project sponsor agrees that a threat is outside the scope of the project or that the proposed response would exceed the project manager's authority.



**Transfer.** Transfer involves shifting ownership of a threat to a third party to manage the risk and to bear the impact if the threat occurs.



**Mitigate.** In threat mitigation, action is taken to reduce the probability of occurrence and/or impact of a threat. Early mitigation action is often more effective than trying to repair the damage after the threat has occurred.



**Accept.** Threat acceptance acknowledges the existence of a threat, but no proactive action is planned. Actively accepting a risk can include developing a contingency plan that would be triggered if the event occurred; or it can include passive acceptance, which means doing nothing.

# RISK - Threats

A response to a specific threat might include multiple strategies. For example, if the threat cannot be avoided, it may be mitigated to a level at which it becomes viable to transfer or to accept it.

*The goal of implementing threat responses is to reduce the amount of negative risk.* Risks that are accepted sometimes are reduced simply by the passage of time or because the risk event does not occur.

# RISK - Opportunities

An opportunity is an event or condition that, if it occurs, has a positive impact on one or more project objectives. An example of an opportunity could be a time and materials based subcontractor who finishes work early, resulting in lower costs and schedule savings.



**Exploit.** A response strategy whereby the project team acts to ensure that an opportunity occurs.



**Escalate.** As with threats, this opportunity response strategy is used when the project team or the project sponsor agrees that an opportunity is outside the scope of the project or that the proposed response would exceed the project manager's authority.



**Share.** Opportunity sharing involves allocating ownership of an opportunity to a third party who is the best able to capture the benefit of that opportunity.



**Enhance.** In opportunity enhancement, the project team acts to increase the probability of occurrence or impact of an opportunity. Early enhancement action is often more effective than trying to improve the opportunity after it has occurred.



**Accept.** As with threats, accepting an opportunity acknowledges its existence but no proactive action is planned.

# RISK - Opportunities

Once a set of risk responses has been developed, it should be reviewed to see whether the planned responses have added any secondary risks. The review should also assess the residual risk that will remain once the response actions have been carried out. Response planning should be repeated until residual risk is compatible with the organization's risk appetite.

Taking an encounter view of work prioritization allows team to prioritize threat avoidance and reduction activities. Comparing the expected monetary value (EMV) of a risk to the anticipated return on investment (ROI) of a deliverable or feature allows the project manager to have conversations with sponsors or product owners about where and when to incorporate risks responses into the planned work.

# RISK – Management & Contingency Reserve

Reserve is an amount of time or budget set aside to account for handling risks. Contingency reserve is set aside to address identified risks should they occur. Management reserve is a budget category used for unknown events such as unplanned, in-scope work.

# RISK – Risk Review

Establishing a frequent rhythm or cadence of review and feedback sessions from a broad selection of stakeholders is helpful for navigating project risk and being proactive with risk responses.

Daily standup meetings can be used in any project and are a source for identifying potential threats and opportunities. Reports of blockers or impediments could become threats if they continue to delay progress. Likewise, reports of progress and breakthroughs might point toward opportunities to be further leveraged and shared.

Addressing risk at weekly status meetings ensure that risk management remains relevant. These meetings can be used to identify new risks as well as identify changes to existing risks.

Retrospective and lessons learned meetings can be used to identify threats to performance, project team cohesion, etc, and to seek improvements. They can also help identify practices to try different ways to exploit and enhance opportunities.

# INTERACTION WITH OTHER PERFORMANCE DOMAINS

The Uncertainty Performance Domain interacts with the Planning, Project Work, Delivery, and Measurement Performance Domains from the product or deliverable perspective. As planning is conducted, activities to reduce uncertainty and risks can be built into the plans. These are carried out in the Delivery Performance Domain. Measurements can indicate if the risk level is changing over time.

Project team members and other stakeholders are the main sources of information regarding uncertainty. They can provide information, suggestions, and assistance in working with all the various forms of uncertainty.

# CHECKING RESULTS

The table below identifies the outcomes on the left and ways of checking them on the right.

**Checking Outcomes – Uncertainty Performance Domain**

Outcome	Check
An awareness of the environment in which projects occur, including, but not limited to, the technical, social, political, market, and economic environments.	The team incorporates environmental considerations when evaluating uncertainty, risks, and responses.
Proactively exploring and responding to uncertainty.	Risk responses are aligned with the prioritization of project constraints, such as budget, schedule, and performance.
An awareness of the interdependence of multiple variables on the project.	Actions to address complexity, ambiguity, and volatility are appropriate for the project
The capacity to anticipate threats and opportunities and understand the consequences of issues.	Systems for identifying, capturing, and responding to risk are appropriately robust.
Project delivery with little or no negative impact from unforeseen events or conditions.	Schedules delivery dates are met, and the budge performance is within the variance threshold.
Realized opportunities to improve project performance and outcomes.	Teams use established mechanisms to identify and leverage opportunities.
Cost and schedule reserves used effectively to remain alignment with project objectives.	Teams take steps to proactively prevent threats, thereby limiting use of cost or schedule reserve.

Q & A?

