MODELS, METHODS & ARTIFACTS

PROJECT MANAGEMENT PROFESSIONAL CLASS

(PMBOK 7TH EDITION)

Naphtali
P M LIMITED
............All Projects

OVERVIEW

This section provides a high level description of some commonly used models, methods, and artifacts that are useful in managing projects. The items listed in this section are not intended to be exhaustive or prescriptive, but rather to help project teams think about the opinions available to them.

In the context of this guide, terms are defined as follows:

MODELING

Model. A model is a thinking strategy to explain a process, framework, or phenomenon.

Method. A method is the means for achieving an outcome, output, result, or project deliverable.

Artifact. An artifact can be a template, document, output, or project deliverable.

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OVERVIEW

Principles of Project Management			
Be a diligent, respectful and caring steward	Create a collaborative team environment	Effectively engage with stakeholders	Focus on value
Recognize, evaluate, and respond to system interactions	Demonstrate leadership behaviors	Tailor based on content	Build quality into processes and deliverables
Navigate complexity	Optimize risk responses	Embrace adaptability and resiliency	Enable change to achieve the envisioned future state

Guide Behaviour

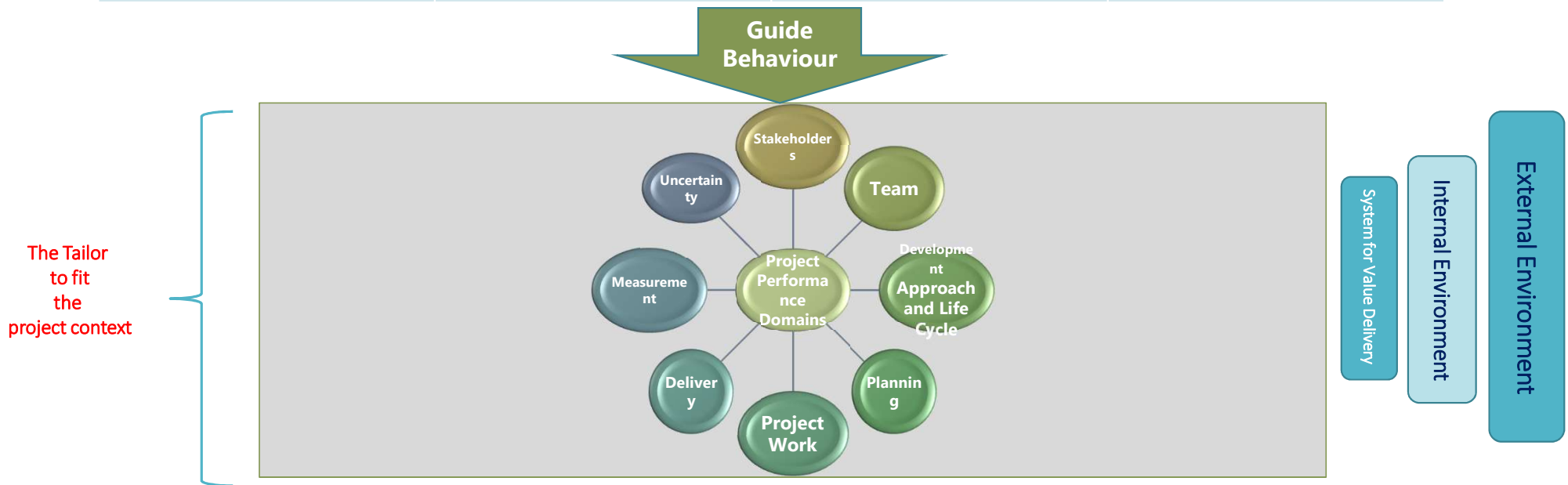The Tailor to fit the project context

Fig 1 – Tailoring to fit the Project Context

OVERVIEW

As with any process, the use of models, methods, and artifacts has associated costs related to time, level of expertise/proficiency in use, impact on productivity, etc. Project teams should consider these implications when deciding within elements to use. As much as possible, project teams should avoid using anything that:

Duplicate or adds unnecessary effort,

Is **not useful** to the project team and its stakeholders,

Produces incorrect or misleading information, or

Caters to individual needs versus those of the project team.

COMMONLY USED MODELS

Models reflect small scale, simplified views of reality and present scenarios, strategies, or approaches for optimizing work processes and efforts. A model helps to explain how something works in the real world. Models can shape behavior and point to approaches for solving problems or meeting needs. Some models were developed with projects and project teams in mind, others are more general in nature. Where feasible, models in this section are presented as they apply to projects. The content in this section does not describe how to develop or create new models.

The model descriptions presented provide a high level view. Project team members and other stakeholders can refer to many sources (e.g. PMI's library of standards products and PMI standards+) for more complete descriptions and explanations of the models.

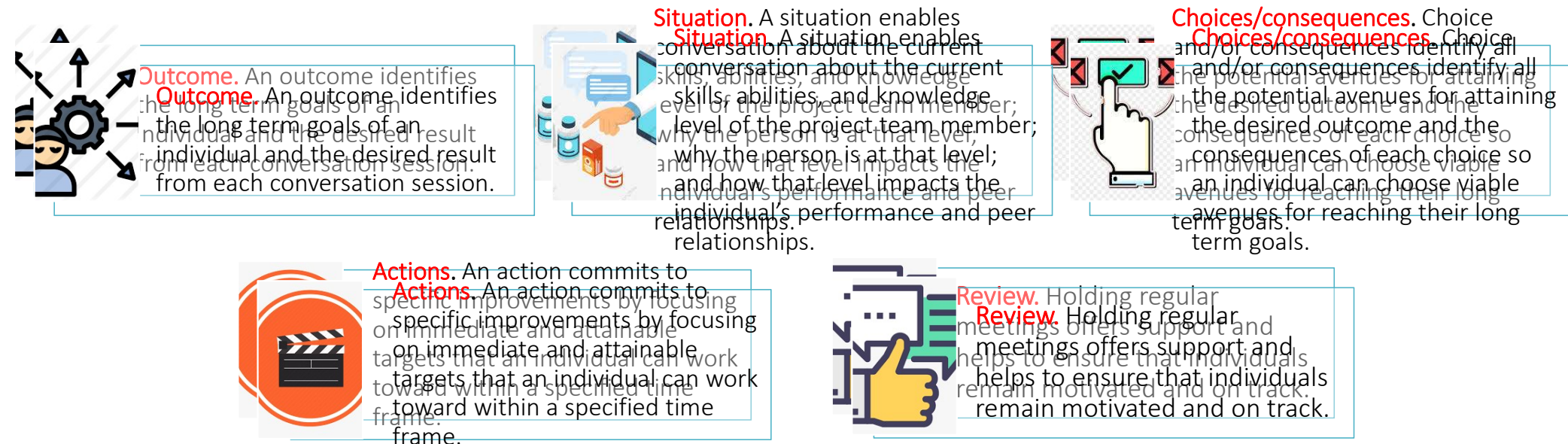# COMMONLY USED MODELS – Situational Leadership Models

Situational leadership models are a subject of a vast array of leadership models. Just as project teams tailor the processes, methods, life cycles, and development approaches, leadership styles are also tailored. Situational leadership models describe ways to tailor one's leadership style to meet the needs of the individual and the project team. The following are examples of two situational leadership models.

Situational Leadership (II)

Ken Blanchard's Situational Leadership (II) measures project team member development using competence and commitment as the two main variables. Competence is the combination of ability, knowledge, and skill. Commitment speaks to the confidence and motivation an individual has. As an individual's competence and commitment evolve, leadership styles evolve from directing to coaching to supporting to delegating in order to meet the individual's needs.

COMMONLY USED MODELS – Oscar Model

The OSCAR coaching and mentoring model was developed by Karen Whittleworth and Andrew Gilbert. It helps individuals adapt their coaching or leadership styles to support individuals who have an action plan for personal development. The model refers to five contributing factors:

Outcome. An outcome identifies the long term goals of an individual and the desired result from each conversation session.

Situation. A situation enables conversation about the current skills, abilities, and knowledge level of the project team member; why the person is at that level; and how that level impacts the individual's performance and peer relationships.

Choices/consequences. Choice and/or consequences identify all the potential avenues for attaining the desired outcome and the consequences of each choice so an individual can choose viable avenues for reaching their long term goals.

Actions. An action commits to specific improvements by focusing on immediate and attainable targets that an individual can work toward within a specified time frame.

Review. Holding regular meetings offers support and helps to ensure that individuals remain motivated and on track.

COMMONLY USED MODELS – Communication Models

Project success is dependent on effective communication. Communication models demonstrate concepts associated with how sender and receiver frames of reference impact the effectiveness of communication, how the communication medium influences the effectiveness of communication, and the types of disconnects between end user expectations and reality.

Cross Cultural Communication

A communication model developed by Broways and Price incorporates the idea that the message itself and how it is transmitted is influenced by the sender's current knowledge, experience, language, thinking, and communication styles, as well as stereotypes and relationship to the receiver. Similarly, the receiver's knowledge, experience, language, thinking, and communication styles, as well as stereotypes and relationship to the sender will influence how the message is interpreted.

COMMONLY USED MODELS – Effectiveness of Communication Channels

Alistair Cockburn developed a model that describes the communication channels along the axes of effectiveness and richness. As defined by Richard Daft and Robert Lengel, richness relates to the amount of learning that can be transmitted through a medium. Media richness is a function of characteristics, including the ability to:

Handle multiple information cues simultaneously,

Facilitate rapid feedback,

Establish a personal focus, and

Utilize natural language.

COMMONLY USED MODELS – Effectiveness of Communication Channels

Richness in communication allows a broad spectrum of information to be conveyed rapidly. Situations that entail complex, complicated, and personal information benefit from richer communication channels, such as face-to-face communication. Situations that impart simple, factual information can use less rich communication channels such as a note or a text message.

MOTIVATION MODELS

People perform better when they are motivated, and people are motivated by different things. Understanding what motivates project team members and other stakeholders helps to tailor rewards to the individual, thereby eliciting more effective engagement. There are a significant number of models that illustrate how people are motivated. Four models are described in section subsequently, though these are a small representation of available models.

MOTIVATION MODELS – Hygiene & Motivational Factors

Frederick Herzberg conducted a study of motivational factors in working life. He believed that job satisfaction and dissatisfaction stem from conditions called motivational factors. Motivational factors include matters that relate to the content of the work, such as achievement, growth, and advancement. Insufficient motivational factors lead to dissatisfaction. Sufficient motivational factors lead to satisfaction.

Herzberg also identified hygiene factors related to the work, such as company policies, salary, and the physical environment. If hygiene factors are insufficient, they cause dissatisfaction. However, even if they are sufficient, they do not lead to satisfaction.

MOTIVATION MODELS – Intrinsic Versus Extrinsic Motivation

Daniel Pink published several books about the intrinsic factors that motivate people. He stated that while extrinsic rewards, such as salary, are motivators to a certain extent, once a person is paid fairly for their work, the motivational power of extrinsic rewards cease to exist. For complicated and challenging work, such as much of the work on projects, intrinsic motivators are far longer lasting and more effective. Pink identifies three types of intrinsic motivators: autonomy, mastery, and purpose:

Autonomy. Autonomy is the desire to direct one's own life. This is aligned with being able to determine how, where, and when to accomplish work. Autonomy includes flexible work hours, working from home, and work on self selecting and self managing project teams.

Mastery. Mastery is about being able to improve and excel. The desire to do excellent work, learn, and achieve goals are aspects of mastery.

Purpose. Purpose speaks to the need to make a difference. Knowing the project vision and how work contributes to achieving that vision allows people to feel like they are making a difference.

MOTIVATION MODELS – Theory of Needs

David McClellan's model states that all people are driven by needs of achievement, power, and affiliation.

The relative strength of each need depends on an individual's experiences and culture.

Achievement. People who are motivated by achievement, such as reaching a goal, are motivated by activities and work that is challenging, but reasonable.

Power. People who are motivated by power like to organize, motivated, and lead others. They are motivated by increased responsibility.

Affiliation. People who are motivated by affiliation seek acceptance and belonging. They are motivated by being part of a team.

MOTIVATION MODELS – Theory X, Theory Y, & Theory Z

Douglas McGregor devised the Theory X and Theory Y models, which represent a spectrum of employee motivation and corresponding management styles. This was later expanded to include Theory Z.

· Theory X. The X side of the spectrum assumes individuals work for the sole purpose of income. They are not ambitious or goal oriented. The corresponding management style to motivate these individuals is a hand-on- and top-down approach. This management style is often seen in a production or labour intensive environment, or one with many layers of management.

Theory Y. The Y side of the spectrum assumes that individuals are intrinsically motivated to do good work. The corresponding management style has a more personal coaching feel. The manager encourages creativity and discussion. This management style is often seen in creative and knowledge worker environments.

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Theory Z. *Abraham Maslow* saw Theory Z as a transcendent dimension to work where individuals are motivated by self realization, values, and a higher calling. The optimal management style in this situation is one that cultivates insight and meaning.

William Ouchi's version of Theory Z focuses on motivating employees by creating a job for life where the focus is on the well being of employees and their families. This style of management seeks to promote high productivity, morale, and satisfaction

CHANGE MODELS

Many projects contain an aspect of changing systems, behaviors, activities, and sometimes, cultures. Managing this type of change requires thinking about how to transition from the current to the future desired state. There are many models that describe the activities necessary for successful change management. Subsequent Sections provide samplings of the change models.

CHANGE MODELS – Managing Change in Organisation

Managing Change in Organizations: A Practice Guide (3) is an iterative model that is based on common elements across a range of change management models. The framework has five associated elements interconnected through a series of feedback loops:

Formulate change. This element focuses on building the rationale to help people understand why change is needed and how the future state will be better.

. **Plan change.** The identification of activities helps people prepare for the transition from the current to the future state

Implement change. This iterative element focuses on demonstrating the future state capabilities, checking to ensure the capabilities are having the intended impact, and making necessary improvements or adaptations in response.

Manage transition. This element considers how to address needs related to the change that may surface once the future state is achieved.

Sustain change. This element seeks to ensure that the new capabilities continue and previous processes or behaviors cease.

CHANGE MODELS – Adakar Model

Jeff Hiatt developed the ADKAR Model which focuses on five sequential steps that individuals undergo when adapting to change.

Step 1: Awareness. This step identifies why the change is necessary.

Step 2: Desire. Once people know why the change is necessary, there needs to be a desire to be part of and support the change.

Step 3: Knowledge. People need to understand how to change. This includes understanding new processes and systems in addition to new roles and responsibilities. Knowledge can be imparted through training and education.

Step 4: Ability. In this step, knowledge is supported with hands-on practice and access to expertise and help as needed.

Step 5: Reinforcement. Reinforcement supports the sustainment of the change. This can include rewards, recognition, feedback, and measurement.

CHANGE MODELS – The 8 Steps Process for Leading Change

John Kotter introduced the 8-Step Process for Leading Change for transforming organizations. It is a top down approach where the need for and approach to change originates at the top levels of the organization, and then is promoted down through the organization's layers of management to the change recipients. The eight steps are:

Step 1: Create urgency. Identify potential threats and opportunities that drive the need for change.

Step 2: From a powerful coalition. Identify the change leaders. Change leaders are not necessarily based on hierarchy. The change leaders should be influential people from a variety of roles, expertise, social, and political importance.

Step 3: Create a vision for change. Identify the values that are central to the change. then create a brief vision statement that summarizes the change. Next, identify a strategy to realize the vision.

Step 4: Communicate the vision. Communicate the vision throughout the change process. Apply the vision throughout all aspects of the organization. Senior management and the change coalition should consistently communicate the vision and demonstrate the urgency and benefits of the change.

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Step 5: Remove obstacles. All change comes with obstacles. Sometimes the obstacles are outdated processes, sometimes they are based on the organizational structure, and sometimes they are people resistant to change. Regardless, all obstacles need to be addressed.

Step 6: Create short-term wins. Identify quick and easy wins to build momentum and support for the change.

Step 7: Build on the change. Once the short-term wins are complete, the organization needs to set goals for continued improvements.

Step 8: Anchor the changes in corporate culture. Ensure the change becomes ingrained into the culture: continue to communicate the vision, tell success stories, recognize people in the organization who embody and empower the change, and continue to support the change coalition.

CHANGE MODELS – Virginia Satir Change Model

Virginia Satir developed a model of how people experience and cope with change. its purpose is to help project team members understand what they are feeling and enable them to move through change more efficiently.

Late status quo. This initial stage is when everything feels familiar and can be characterized as "business as usual." For some people, business as usual may be good because they know what to expect. For others, this status may feel a bit stale or boring.

The foreign element. Something happens that shifts the status quo in this stage. This may include initiating a project that introduces change to people's usual way of working. There is often a period of resistance and reduction in performance after the change is introduced. People may ignore the change or dismiss its relevance.

Chaos. People are in unfamiliar territory. They are no longer comfortable, and performance drops to its lowest level. Feelings, actions, and behaviors are unpredictable. Some people feel anxious, others may shut down, and some individuals may feel excited. Chaos can make people very creative as they try to find ways to make sense of the situation. They try various ideas and behaviors to see which of these has a positive outcome.

CHANGE MODELS – Virginia Satir Change Model

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The transforming idea. People come to a point where they come up with an idea that helps them make sense of the situation. They begin to see how they can find a way out of the chaos and cope with the new reality. Work performance begins to increase.

Practice and integration. People try to impellent their new ideas or behaviors. There may be setbacks and a period of trial and error, but eventually they learn what works and what doesn't. This leads to improved performance. Often performance is at a higher level than it was before the foreign element was introduced.

New status quo. People get used to the new environment, and their performance stabilizes. Eventually, the new status quo becomes the normal way of working.

CHANGE MODELS – Transition Model

William Bridges' Transition Model provides an understanding of what occurs to individuals psychologically when an organizational change takes place. This model differentiates between change and transition. Change is situational and happens whether or not people transition through it. Transition is a psychological process where people gradually accept the details of the new situation and the changes that come with it.

The model identifies three stages of transition associated with change.

Ending, losing, and letting go. The change is introduced in this stage. It is often associated with fear, anger, upset, uncertainty, denial, and resistance to the change.

The neutral zone. The change is happening in this stage. In some instances, people may feel frustration, resentment, confusion, and anxiety about the change. Productivity may drop as people learn new ways of doing work. In other instances, people may become very creative, innovative, and passionate about trying new ways of working.

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The new beginning. At this point, people accept and even embrace the change. They are becoming more adept at the new skills and the new ways of working. People are often open to learning and are energized by the change.

COMPLEXITY MODELS

Projects exist in a state of ambiguity and require interactions among multiple systems, often with uncertain outcomes. Complexity is a challenge to work with. The two models described in Sections below provides a framework to understand complexity and determine how to make decisions in a complex environment.

COMPLEXITY MODELS – Cynefin Framework

The Cynefin framework, created by *Dave Snowden*, is a conceptual framework used to diagnose cause-and-effect relationships as a decision making aid. The framework offers five problems and decision making contexts:

Where there is an obvious cause and effect relationship, best practices are used to make decisions.

Complicated relationships exist when there is a set of known unknowns or a range of correct answers. In these situations, it is best to assess the fact, analyze the situation, and apply good practices.

Complex relationships include unknown unknowns. There is no apparent cause and effect, and there are no obvious right answers. In complex environments, one should probe the environment, sense the situation, and respond with action. This style uses emergent practices that allow for repeated cycles of probe sense respond as complex environments change in reaction to multiple stimuli, and what worked once may not be effective the next time.

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In chaotic environments, the cause and effects are unclear. There is too much confusion to wait to understand the situation. In these situations, the first step is to take action to try and stabilize the situation, then sense where there is some stability, and respond by taking steps to get the chaotic situation to a complex situation.

Disordered relationships lack clarity and may require breaking them into smaller parts whose context links with one of the other four contexts.

The Cynefin framework helps identify behaviors, such as *probing*, *sensing*, *responding*, *acting*, and *categorizing*, which can help impact the relationships between variables and guide actions.

COMPLEXITY MODELS – Stacey Matrix

Ralph Stacey developed the Stacey matrix which is similar to the Cynefin framework, but it looks at two dimensions to determine the relative complexity of a project:

(a) the relative uncertainty of the requirements for the deliverable, and

(b) the relative uncertainty of the technology that will be used to create the deliverable. Based on the relative uncertainty of these dimensions, a project is considered simple, complicated, complex, or chaotic.

The degree of complexity is one factor that influences tailoring methods and practices for the project.

PROJECT TEAM DEVELOPMENT MODELS

Project teams move through different stages of development. Understanding the stage of the team in its development helps project managers support the project team and its growth. The two models presented in the Sections below Illustrate how project teams move through different stages to become high performing project teams.

PROJECT TEAM DEVELOPMENT MODELS - Tuckman Model

Bruce Tuckman articulated the stages of team development as forming, storming, norming, and performing. Many people add a fifth stage, adjourning.

Forming. The project team first comes together. Members get to know each other's name, position on the project team, skill sets, and other pertinent background information. This might occur in the kickoff meeting.

Storming. Project team members jockey for position on the team. This phase is where people's personalities, strengths, and weaknesses start to come out. There might be some conflict or struggle as people figure out how to work together. Storming might go on for some time or pass relatively quickly.

Norming. The project team starts to function as a collective body. At this point, project team members know their places on the team and how they relate to and interface with all the other members. They are starting to work together. There might be some challenges as work progresses, but these issues are resolved quickly, and the project team moves into action.

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Performing. The project team becomes operationally efficient. This is the mature project team stage. Project teams that have been together for a while are able to develop a synergy. By working together, project team members accomplish more and produce a high-quality product.

Adjourning. The project team completes the work and disperses to work on other things. If the project team has formed good relationship, some project team members might be sad about leaving the project team.

The project team culture in this model starts in the forming stage and evolves throughout the rest of the development stages. While this model shows a linear progression, project teams can move back and forth between these stages. In addition, not all project teams achieve the performing or even the norming stages.

PROJECT TEAM DEVELOPMENT MODELS - Tuckman Model

Forming

Storming

Norming

Performing

Adjourning

01

02

03

04

05
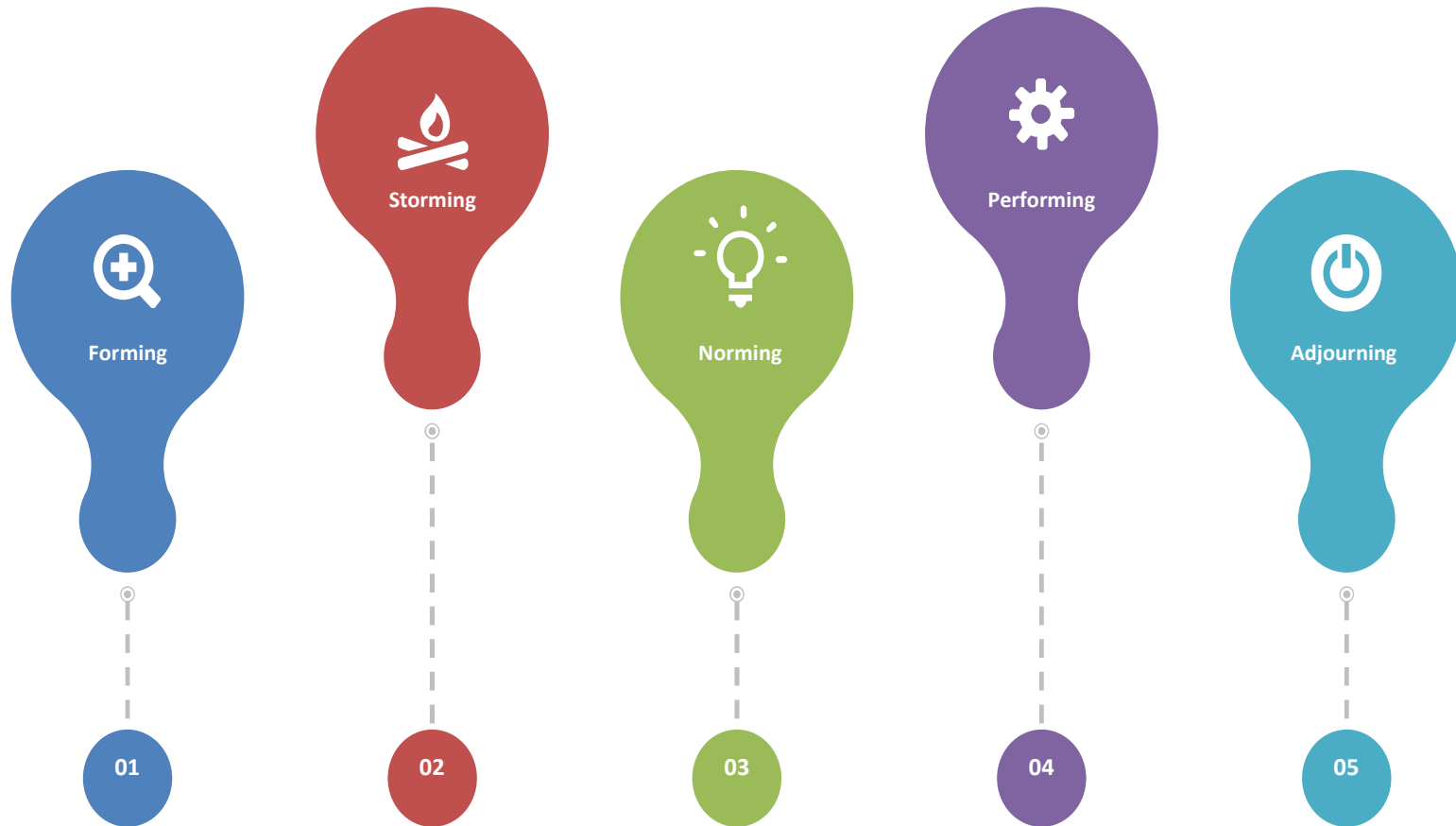
PROJECT TEAM DEVELOPMENT MODELS – Drexler/Sibbet Performance Model

Allan Drexier and *David Sibbet* developed a team performance model with seven steps. Steps 1 through 4 describe the stages in creating a project team, and steps 5 through 7 cover project team sustainability and performance.

Step 1: Orientation. Orientation answers the question of why. In this stage, the project team learns the purpose and mission for the project. This usually occurs at a kickoff meeting, or is documented in a business cases, project charter, or lean start-up canvas.

Step 2: Trust building. Trust building answers the question of who. This stage sheds light on who is on the project team and the skills and abilities each person brings. It can also include information about key stakeholders who may not be part of the project team but can influence the project team.

Step 3: Goal clarification. Goal clarification answers what. In this stage, the project team elaborates the right level project information. This may include finding out more about stakeholder expectations, requirements, assumptions, and deliverable acceptance criteria.

PROJECT TEAM DEVELOPMENT MODELS – Drexler/Sibbet Performance Model

Step 4: Commitment. Commitment addresses the question of how. In this stage, the project team starts to define plans to achieve the goals. This can include milestone schedules, release plans, high level budges, resource needs, and so forth.

Step 5: Implementation. High level plans are decomposed into greater levels of detail, such as a detailed schedule or backlog. The project team starts working together to produce deliverables.

Step 6: High performance. After the project team has worked together for some time, project team members reach a high level of performance. They work well together, don't need much oversight, and experience synergies within the project team.

Step 7: Renewal. Renewal is the stage of working through changes on the project team or the project. The deliverables, stakeholders, environment, project team leadership, or team membership may change. this causes the project team to consider if the past behavior and actions are still sufficient, or if the project team needs to go back to a previous stage to reset the expectations and ways of working together.

OTHER MODELS - Conflict Model

Conflict is common on projects. Conflict can be <u>healthy and productive</u> when handled well. It can result in greater trust among project team members and a deeper commitment to the outcomes. Fear of conflict can restrict communication and creativity. However, conflict can be unhealthy as well. Addressing conflict inappropriately can lead to dissatisfaction, lack of trust, and reduced morale and motivation. The model based on work by *Ken Thomas* and *Ralph Kilmann* describes six ways of addressing conflict by focusing on the relative power between the individuals and the desire to maintain a good relationship as follows:

OTHER MODELS - Conflict Model

Confronting/problem solving. Confronting a conflict treats the conflict as a problem to be solved. This style of conflict resolution is used when the relationship between parties is important, and when each person has confidence in the other party's ability to problem solve.

Collaborating. Collaborating involves incorporating multiple views about the conflict. The objective is to learn about the various views and see things from multiple perspectives. This is an effective method when there is trust among the participants and when there is time to come to consensus. A project manager may facilitate this type of conflict resolution between project team members.

Compromising. There are some conflicts in which all parties will not be fully satisfied. In those instances, finding a way to compromise is the best approach. Compromise entails a willingness to give and take. This allows all parties to get something they want, and it avoids escalating the conflict. This style is often used when the parties involved have equal "power". A project manager may compromise with a technical manager regarding the availability of a project team member to work on the project.

OTHER MODELS - Conflict Model

Smoothing/accommodating. Smoothing and accommodating are useful when reaching the overarching goal is more important than the disagreement. This approach maintains harmony in the relationship and can create good will between the parties. This approach is also used when there is a difference in the relative authority or power of the individuals. For example, this approach may be appropriate when there is a disagreement with the sponsor. Since the sponsor outranks the project manager or project team member, and there is a desire to maintain a good relationship with the sponsor, adopting an accommodating posture may be appropriate.

Forcing. Forcing is used when there is not enough time to collaborate or problem solve. In this scenario, one party forces their will on the other. The party forcing has more power than the other party. A forcing style may be used if there is a health and safety conflict that needs to be resolved immediately.

Withdrawal/avoiding. Sometimes a problem will go away on its own, or sometimes discussions get heated and people need a cooling off period. In both scenarios, withdrawing from the situation is appropriate. Withdrawal is also used in a no-win scenario, such as complying with a requirement imposed by a regulatory agency instead of challenging the requirement.

OTHER MODELS - Negotiation

There are many models for negotiation. One model is Steven Covey's principle of _"Think Win-Win"_. This principle applies to all interactions, not just negotiations, but it is described here in the context of negotiation. In negotiations, there are different possible outcomes:

Win-win. This is the optimal outcome, where each person is satisfied with the outcome.

Win-lose/lose-win. This describes a completion perspective where in order to win, someone else loses. It may also come from a martyr perspective where someone chooses to lose so that others can win.

Lose-lose. This outcome can occur when win-win outcomes may have been possible, but competition overwhelms collaboration. In this scenario, everyone ends up worse off.

OTHER MODELS - Negotiation

A win-win perspective is generally found when the following aspects are present:

Character. The parties involved are mature, demonstrate integrity, and share the perspective that there is enough value for everybody.

Trust. The parties trust each other, establish agreements on how to operate, and are accountable.

Approach. Each party is willing to look at the situation from the other's point of view. The parties work together to identify key issues and concerns. They identify what an acceptable solution looks like and identify options to achieve an acceptable solution.

OTHER MODELS - Planning

Barry Boehm developed a model that compares the time and effort invested in developing plans to reduce risk, including the delay and other costs associated with over planning. By taking more time to plan up front, many projects can reduce uncertainty, oversights, and rework.

OTHER MODELS - Process Groups

Planning

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OTHER MODELS - Process Groups

Project management processes can be organized into logical groupings of project management inputs, tools and techniques, and outputs that are tailored to meet the needs of the organization, stakeholders, and the project.

Groups of processes are not project phases. The Process Groups interact within each phase of a project life cycle. It is possible that all of these processes could occur within a single phase. Processes may be iterated within a phase or life cycle. The number of iterations and interactions between processes varies based on the needs of the project.

Projects that follow a process based approach may use the following five process groupings as an organizing structure.

OTHER MODELS - Process Groups

Initiating. Those processes performed to define a new project or a new phase of an existing project by obtaining authorization to start the project or phase.

Planning. Those processes required to establish the scope of the project, refine the objectives, and define the course of action required to attain the objectives that the project was undertaken to achieve.
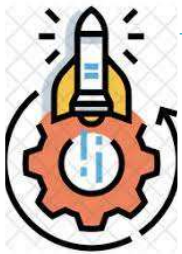
Executing. Those processes performed to complete the work defined in the project management plan to satisfy the project requirements.
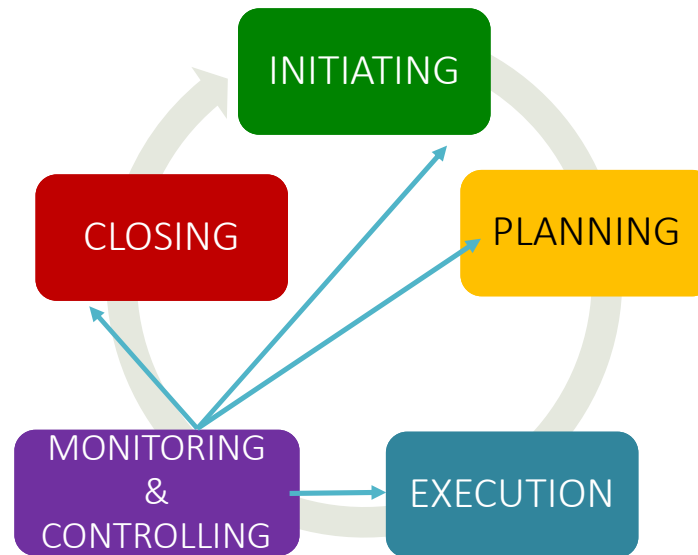
Monitoring and controlling. Those processes required to track, review, and regulate the progress and performance of the project, identify any areas in which changes to the plan are required; and initiate the corresponding changes.

Closing. Those processes performed to formally complete or close a project, phase, or contract.

OTHER MODELS - Process Groups

These Process Groups are independent of the delivery approach, application areas (such as marketing, information services, and accounting), or industry (such as construction, aerospace, and telecommunications). In a process based approach, the out of one process generally becomes an input to another process or is a deliverable of the project or project phase.

OTHER MODELS - Salience Model

The Salience Model is about stakeholders. Salience means prominent, noticeable, or perceived as important. This model was proposed by Ronald K. Mitchell, Bradley R. Agle, and Donna J. Wood. The authors denoted a stakeholder identification based on three variables: power to influence, legitimacy of the stakeholders' relationships with the project, and the urgency of the stakeholder's claim on the project for stakeholder engagement.

MODELS APPLIED ACROSS PERFORMANCE DOMAINS

Different models are more likely to be useful in different project performance domains. While the needs of the project, stakeholders, and organizational environment will determine which models are most applicable for a specific project, there are some performance domains that are more likely to make use of each model. Table 4 suggest the performance domain(s) where each model is most likely to be of use; however, the project manager and project team have the ultimate responsibility to selecting the right models for their project.

Table 4-1. Mapping of Models Likely to Be Used in Each Performance Domain

Model	Team	Stakeholders	Dev Approach and Life Cycle	Planning	Project Work	Delivery	Measurement	Uncertainty
Situational Leadership Models:								
Situational Leadership® II	X				X			
OSCAR	X				X			
Communication Models:								
Cross-cultural communication	X	X		X	X			
Effectiveness of communication channels	X	X		X	X			
Gulf of execution and evaluation		X				X		
Motivation Models:								
Hygiene and motivation factors	X			X	X			
Intrinsic versus extrinsic motivation	X			X	X			
Theory of needs	X			X	X			
Theory X, Theory Y, and Theory Z	X			X	X			
Change Models:								
Managing Change in Organizations		X		X	X			
ADKAR®		X		X	X			
8-Step Process for Leading Change		X		X	X			
Transition		X		X	X			
Complexity Models:								
Cynefin framework			X	X	X	X		X
Stacey matrix			X	X	X	X		X
Project Team Development Models:								
Tuckman Ladder	X				X			
Drexler/Sibbet Team Performance	X				X			
Other Models:								
Conflict	X	X			X			
Negotiation		X		X	X	X		
Planning			X	X	X			
Process Groups				X	X	X	X	
Salience		X		X	X			

COMMONLY USED METHODS

A method is a means for achieving an outcome, output, result, or project deliverable. The methods described here are a sampling of those commonly used to support project work. There are many methods that are not described here, either because they used in project management the same way they are in other disciplines, such as interviewing, focus groups, checklist, and so forth, or because they are not frequently used across a broad spectrum of projects (i.e. the methods are industry specific).

Many of the methods are related by the purpose they serve, such as estimating or data gathering, and therefore, are presented in a group. Others are related by the type of activity involved, such as those in the meetings and analysis groups.

COMMONLY USED METHODS – Data Gathering Analysis

Data gathering and analysis methods are used to collect, assess, and evaluate data and information to gain a deeper understanding of a situation. The outputs of data analysis may be organized and presented as one of the artifacts shows in section 4.6.6. The data gathering and analysis methods described here, coupled with the artifacts described in section 4.6.6, are often used to inform decisions.

Alternative analysis. Alternatives analysis is used to evaluate identified options in order to select the options or approaches to perform the work of the project.

Assumption and constraint analysis. An assumption is a factor that is considered to be true, real, or certain, without proof or demonstration. A constraint is a limiting factor that affects the execution of a project, program, portfolio, or process. This form of analysis ensures that assumptions and constraints are integrated into the project plans and documents, and that there is consistency among them.

COMMONLY USED METHODS – Data Gathering Analysis

Benchmarking. Benchmarking is the comparison of actual or planned products, processes, and practices to those of comparable organizations, which identifies best practices, generates ideas for improvement, and provides a basis for measuring performance.

Business justification analysis methods. This group of analysis methods is associated with authorizing or justifying a project or a decision. The outcomes of the following analyses are often used in a business case that justifies undertaking a project.

Payback period. The payback period is the time needed to recover an investment usually in months or years.

Internal rate of return (IRR). The internal rate of return is the projected annual yield of a project investment, incorporating both initial and ongoing costs into an estimated percentage growth rate a given project is expected to have.

Return on investment (ROI). Return on investment is the percent return on an initial investment,

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COMMONLY USED METHODS – Data Gathering Analysis

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o **Return on investment (ROI).** Return on investment is the percent return on an initial investment, calculated by taking the projected average of all net benefits and dividing them by the initial cost.

o **Net present value (NPV).** Net present value is the future value of expected benefits, expressed in the value those benefits have at the time of investment. NPV considers current and future costs and benefits and inflation.

o **Cost benefit analysis.** A cost benefit analysis is a financial analysis tool used to determine the benefits provided by a project against its costs.

COMMONLY USED METHODS – Data Gathering Analysis

Check sheet. A check sheet is a tally sheet that can be used as a checklist when gathering data. Check sheets can be used to collect and segregate data into categories. Check sheets can also be used to create histograms and matrices as described in sections below

Cost of quality. The cost of quality includes all costs incurred over the life of the product by investment in preventing nonconformance to requirements, appraisal of the product or service for conformance to requirements, and failure to meet requirements.

Decision tree analysis. A decision tree analysis is a diagramming and calculation method for evaluating the implications of a chain of multiple options in the presence of uncertainty. Decision trees can use the information generated from an expected monetary value analysis to populate the branches of the decision tree.

Earned value analysis. Earned value analysis is a method that utilizes a set of measures associated with scope, schedule, and cost to determine the cost and schedule performance of a project.

COMMONLY USED METHODS – Data Gathering Analysis

Expected monetary value (EMV). The expected monetary value is the estimated value of an outcome expressed in monetary terms. It is used for quantify the value of uncertainty, such as a risk, or compare the value of alternatives that are not necessarily equivalent. The EMV is calculated by multiplying the probability that an event will occur and the economic impact the event would have should it occur.

Forecast. A forecast is an estimate or prediction of conditions and events in the project's future, based on information and knowledge available at the time of the forecast. Qualitative forecasting methods use the opinions and judgments of subject matter experts. Quantitative forecasting uses models where the past information is used to predict future performance. Causal or econometric forecasting, such as regression analysis, identifies variables that can have significant impact on future outcomes.

Influence diagram. This diagram is a graphical representation of situations showing causal influences, time ordering of events, and other relationships among variables and outcomes.

Life cycle assessment. This assessment is a tool used to evaluate the total environmental impact of a product, process, or system. It includes all aspects of producing a project deliverable, from the origin of materials used in the deliverable to its distribution and ultimate disposal.

COMMONLY USED METHODS – Data Gathering Analysis

Make-or-buy analysis. A make-or-buy analysis is the process of gathering and organizing data about product requirements and analyzing them against available alternatives such as the purchase versus internal manufacture of the product.

Probability and impact matrix. A probability and impact matrix is a grid for mapping the probability of occurrence of each risk and its impact on project objectives if that risk occurs.

Process analysis. This analysis is a systematic review of the steps and procedures to perform an activity.

Regression analysis. A regression analysis is an analytical technique where a series of input variables are examined in relation to their corresponding output results in order to develop a mathematical or statistical relationship.

COMMONLY USED METHODS – Data Gathering Analysis

Reserve analysis. This analytical technique is used to evaluate the amount of risk on the project and the amount of schedule and budget reserve to determine whether the reserve is sufficient for the remaining risk. The reserve contributes to reducing risk to an acceptable level.

Root cause analysis. This analytical technique is used to determine the basic underlying cause of a variance, defect, or a risk. A root cause may underlie more than one variance, defect, or risk.

Sensitivity analysis. This analytical technique is used to determine which individual project risks or other sources of uncertainty have the most potential impact on project outcomes by correlating variations in project outcomes with variations in elements of a quantitative risk analysis model.

Simulations. This analytical technique uses models to show the combined effect of uncertainties in order to evaluate their potential impact on objectives. A Monte Carlo simulation is a method of identifying the potential impacts of risk and uncertainty using multiple iterations of a computer model to develop a probability distribution of a range of outcomes that could result from a decision or course of action.

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COMMONLY USED METHODS – Data Gathering Analysis

Stakeholder analysis. This technique involves systematically gathering and analyzing quantitative and qualitative information about stakeholders to determine whose interests should be taken into account throughout the project.

SWOT analysis. A SWOT analysis assesses the strengths, weaknesses, opportunities, and threats of an organization, project, or option.

Trend analysis. A trend analysis uses mathematical models to forecast future outcomes based on historical results.

Value stream mapping. Value stream mapping is a lean enterprise method used to document, analyze, and improve the flow of information or materials required to produce a product or service for a customer.

COMMONLY USED METHODS – Data Gathering Analysis

Variance analysis. Variance analysis is used to determine the cause and degree of difference between the baseline and actual performance.

What if scenario analysis. This analytical technique evaluates scenarios in order to predict their effect on project objectives.

COMMONLY USED METHODS – Estimating

Estimating methods are used to develop an approximation of work, time, or cost on a project.

Affinity grouping. Affinity grouping involves classifying items into similar categories or collections on the basis of their likeness. Common affinity groupings include T-shirt sizing and Fibonacci numbers.

Analogous estimating. Analogous estimating assesses the duration or cost of an activity or a project using historical data from a similar activity or project.

Function point. A function point is an estimate of the amount of business functionality in an information system. Function points are used to calculate a functional size measurement (FSM) of a software system.

Multipoint estimating. Multipoint estimating assesses cost or duration by applying an average or weighted average of optimistic, pessimistic, and most likely estimates when there is uncertainty with the individual activity estimates

COMMONLY USED METHODS – Estimating

Parametric estimating. Parametric estimating uses an algorithm to calculate cost or duration based on historical data and project parameters.

Relative estimating. Relative estimating is used to create estimates that are derived from performing a comparison against a similar body of work, taking effort, complexity, and uncertainty into consideration. Relative estimating is not necessarily based on absolute units of cost or time. Story points are a common unitless measure used in relative estimating.

Single point estimating. Single point estimating involves using data to calculate a single value that reflects a best guess estimate. A single point estimate is opposed to a range estimate, which includes the best-and worst-case scenario.

Story point estimating. Story point estimating involves project team members assigning abstract, but relative, points of effort required to implement a user story. It tells the project team about the difficulty of the story considering the complexity, risks, and effort involved.

COMMONLY USED METHODS – Estimating

Wideband Delphi. Wideband Delphi is a variation of the Delphi estimating method where subject matter experts complete multiple rounds of producing estimates individually, with a project team discussion after each round, until a consensus is achieved. For Wideband Delphi, those who created the highest and lowest estimates explain their rationale, following which everyone re-estimates. The process repeats until convergence is achieved. Planning poker is a variation of Wideband Delphi.

COMMONLY USED METHODS – Meetings & Events

Meetings are an important means for engaging the project team and other stakeholders. They are a primary means of communication throughout the project.

Backlog refinement. At a backlog refinement meeting, the backlog is progressively elaborated and (re)prioritized to identify the work that can be accomplished in an upcoming iteration.

Bidder conference. Meeting with prospective sellers prior to the preparation of a bid or proposal to ensure all prospective vendors have a clear and common understanding of the procurement. This meeting may also be known as contractor conference, vendor conferences, or pre-bid conferences.

Change control board (CCB). A change control board meeting includes the group of people who are accountable for reviewing, evaluating, approving, delaying, or rejecting changes to the project. The decisions made at this meeting are recorded and communicated to the appropriate stakeholders. This meeting may also be referred to as a change control meeting.

COMMONLY USED METHODS – Meetings & Events

Daily standup. A standup is a brief collaboration meeting during which the project team reviews its progress from the previous day, declares intentions for the current day, and highlights any obstacles encountered or anticipated. This meeting may also be referred to as a daily scrum.

Iteration planning. An iteration planning meeting is used to clarify the details of the backlog items, acceptance criteria, and work effort required to meet an upcoming iteration commitment. This meeting may also be referred to as a sprint planning meeting.

Iteration review. An iteration review is held at the end of an iteration to demonstrate the work that was accomplished during the iteration. This meeting may also be referred to as a sprint review.

Kickoff. A kickoff meeting is a gathering of project team members and other key stakeholders at the outset of a project to formally set expectations, gain a common understanding, and commence work. It establishes the start of a project, phase, or iteration.

COMMONLY USED METHODS – Meetings & Events

Lessons learned meeting. A lessons learned meeting is used to identify and share the knowledge gained during a project, phase, or iteration with a focus on improving project team performance. This meeting can address situations that could have been handled better in addition to good practices and situations that produced very favorable outcomes.

Planning meeting. A planning meeting is used to create, elaborate, or review a plan or plans and secure commitment for the plan(s).

Project closeout. A project closeout meeting is used to obtain final acceptance of the delivered scope from the sponsor, product owner, or client. This meeting indicates that the product delivery is complete.

Project review. A project review meeting is an event at the end of a phase or a project to assess the status, evaluate the value delivered, and determine if the project is ready to move to the next phase, or transition to operations.

COMMONLY USED METHODS – Meetings & Events

Release planning. Release planning meetings identify a high level plan for releasing or transitioning a product, deliverable, or increment of value.

Retrospective. A retrospective is a regularly occurring workshop in which participants explore their work and results in order to improve both process and product. Retrospectives are a form of lessons learned meeting.

Risk review. A meeting to analyze the status of existing risks and identify new risks. This includes determining if the risk is still active and if there have been changes to the risk attributes (such as probability, impact, urgency, etc). Risk responses are evaluated to determine if they are effective or should be updated. New risks may be identified and analyzed and risks that are no longer active may be closed. Risk reassessment is an example of a risk-review meeting.

Status meeting. A status meeting is a regularly scheduled event to exchange and analyze information about the current progress of the project and its performance.

Steering committee. A meeting where senior stakeholders provide direction and support to the project team and make decisions outside of the project team's authority.

The methods described in this section don't fit into a specific category; however, they are common methods that are used for a variety of purposes on projects.

Impact mapping. Impact mapping is a strategic planning method that serves as a visual roadmap for the organization during product development.

Modeling. Modeling is the process of creating simplified representations of systems, solutions, or deliverables such as prototypes, diagrams, or storyboards. Modeling can facilitate further analysis by identifying gaps in formation, areas of miscommunication, or additional requirements.

Net Promoter Score (NPS). An index that measures the willingness of customers to recommend an organization's products or services to others. The score is used as a proxy for gauging the customer's overall satisfaction with an organization's product or service and the customer's loyalty to the brand.

COMMONLY USED METHODS – Other Methods

Prioritization schema. Prioritization schema are methods used to prioritize portfolio, program, or project components, as well as requirements, risks, features, or other product information. Examples include a Multi-Criteria Weighted Analysis and the MoSCow (**M**ust have, **S**hould have, **C**ould have, and **W**on't have) method.

Timebox. A timebox is a short, fixed period of time in which work is to be completed, such as 1 week, 2 weeks, or 1 month.

METHODS APPLIED ACROSS PERFORMANCE DOMAIN

Different methods are more likely to be useful in each of the performance domains. While the needs of the delivery approach, product, and organizational environment will determine which methods are most applicable for a specific project, there are some performance domains that are more likely to make use of specific methods. Table 5 suggests the performance domain (s) where each method is most likely to be use of; however, the project manager and/or project team have the ultimate responsibility for selecting the right methods for their project.

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METHODS APPLIED ACROSS PERFORMANCE DOMAIN

Table 4-2. Mapping of Methods Likely to Be Used in Each Performance Domain

Method	Team	Stakeholders	Dev Approach and Life Cycle	Planning	Project Work	Delivery	Measurement	Uncertainty
Data Gathering and Analysis Methods:								
Alternatives analysis				X	X	X		X
Assumptions and constraints analysis				X		X		X
Benchmarking						X	X	
Business justification analysis				X			X	
Payback period			X	X			X	
Internal rate of return				X			X	
Return on investment				X			X	
Net present value			X	X		X	X	
Cost-benefit ratio				X			X	
Check sheet						X	X	
Cost of quality				X		X	X	
Decision tree analysis				X				
Earned value analysis				X			X	
Expected monetary value				X				
Forecasting							X	
Influence diagram				X				
Life cycle assessment				X				
Make-or-buy analysis				X	X			
Probability and impact matrix				X				X
Process analysis				X	X	X	X	
Regression analysis				X			X	
Root cause analysis					X	X		
Sensitivity analysis				X	X	X		
Simulation				X			X	
Stakeholder analysis		X		X	X			
SWOT analysis				X				X
Trend analysis							X	
Value stream mapping				X	X	X		
Variance analysis							X	
What-if scenario analysis				X				X

METHODS APPLIED ACROSS PERFORMANCE DOMAIN

Table 4-2. Mapping of Methods Likely to Be Used in Each Performance Domain (cont.)

Method	Team	Stakeholders	Dev Approach and Life Cycle	Planning	Project Work	Delivery	Measurement	Uncertainty
Estimating Methods:								
Affinity grouping				X				
Analogous estimating				X				
Function points				X				
Multipoint estimating				X				
Parametric estimating				X				
Relative estimating				X				
Single-point estimating				X				
Story point estimation				X				
Wideband Delphi				X				
Meeting and Event Methods:								
Backlog refinement		X		X	X	X		
Bidder conference		X		X	X			
Change control board					X	X		
Daily standup				X	X			
Iteration review		X			X	X		
Iteration planning		X		X	X	X		
Kickoff	X	X			X			
Lessons learned		X		X	X	X		
Planning				X				
Project closeout	X	X			X			
Project review		X			X	X	X	
Release planning		X		X				
Retrospective	X			X				
Risk review					X			X
Status					X		X	
Steering committee		X			X			
Other Methods:								
Impact mapping	X	X		X		X	X	
Modeling						X		
Net Promoter Score®		X					X	
Prioritization schema		X			X			
Timebox			X	X	X	X	X	

COMMONLY USED ARTIFACTS

An artifact is a template, document, output, or project deliverable. There are many documents or deliverables that are not described here, either because

(a) they are somewhat generic, such as updates;

(b) they are industry specific; or (

(c) they are a result of a specific method that was used to create it, for example, while cost estimates are an important artifact, they are the result of various estimating methods.

The content in this section is not meant to describe how to develop or create an artifact. The descriptions are presented at a high level as project managers and/or project team members are expected to tailor the use of these artifacts to meet the needs of their particular project.

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COMMONLY USED ARTIFACTS – Strategy Artifacts

Documents that are created prior to or at the start of the project that address strategic, business, or high level information about the project. Strategy artifacts are developed at the start of a project and do not normally change, though they may be reviewed throughout the project.

Business case. A business case is a value proposition for a proposed project that may include financial and nonfinancial benefits.

Business model canvas. This artifact is a one page visual summary that describes the value proposition, infrastructure, customers, and finances. These are often used in lean start up situations.

Project brief. A project brief provides a high level overview of the goals, deliverables, and processes for the project.

Project charter. A project charter is a document issued by the project initiator or sponsor that formally authorizes the existence of a project and provides the project manager with the authority to apply organizational resources to project activities.

Project vision statement. This document is a concise, high level description of the project that states the purpose, and inspires the project team to contribute to the project.

Roadmap. This document provides a high level time line that depicts milestones, significant events, reviews, and decision points.

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COMMONLY USED ARTIFACTS – Strategy Artifacts

Logs and registers are used to record continuously evolving aspects of the project. They are updated throughout the project. The terms log and register are sometimes used interchangeably. It is not uncommon to see the term risk register or risk log referring to the same artifact.

Assumption log. An assumption is a factor that is considered to be true, real, or certain, without proof or demonstration. A constraint is a factor that limits the options for managing a project, program, portfolio, or process. An assumption log records all assumptions and constraints throughout the project.

Backlog. A backlog is an ordered list of work to be done. Projects may have a product backlog, a requirements backlog, impediments backlog, and so forth. Items in a backlog are prioritized. The prioritized work is then scheduled for upcoming iterations.

Change log. A change log is a comprehensive list of changes submitted during the project and their current status. A change can be modification to any formally controlled deliverable, project.

COMMONLY USED ARTIFACTS – Strategy Artifacts

Issue log. An issue is a current condition or situation that may have an impact on the project objectives. An issue log is used to record and monitor information on active issues. Issues are assigned to a responsible party for follow up and resolution.

Lessons learned register. A lessons learned register is used to record knowledge gained during a project, phase, or iteration so that it can be used to improve future performance for the project team and/or the organization.

Risk adjusted backlog. A risk adjusted backlog is a backlog that includes work and actions to address threats and opportunities.

Risk register. A risk register is a repository in which outputs of risk management processes are recorded. Information in a risk register can include the person responsible for managing the risk, probability, impact, risk score, planned risk responses, and other information used to get a high level understanding of individual risks.

Stakeholder register. A stakeholder register records information about project stakeholders, which includes an assessment and classification of project stakeholders.

COMMONLY USED ARTIFACTS – Plan

A plan is a proposed means of accomplishing something. Project teams develop plans for individual aspects of a project and/or combine all of that information into an overarching project management plan. Plans generally are written documents but may also be reflected on visual/virtual whiteboards.

Change control plan. A change control plan is a component of the project management plan that establishes the change control board, documents the extent of its authority, and describes how the change control system will be implemented.

Communication management plan. This plan is a component of the project, program, or portfolio management plan that describes how, when, and by whom information about the project will be administered and disseminated.

Cost management plan. This plan is a component of a project or program management pan that describes how costs will be planned, structured, and controlled.

COMMONLY USED ARTIFACTS – Plan

Iteration plan. This plan is a detailed plan for the current iteration.

Procurement management plan. This plan is a component of the project or program management plan that describes how a project team will acquire goods and services from outside of the performing organization.

Project management plan. The project management plan is a document that describes how the project will be executed, monitored and controlled, and closed.

Quality management plan. This plan is a component of the project or program management plan that describes how applicable policies, procedures, and guidelines will be implemented to achieve the quality objectives.

Release plan. This plan sets expectations for the dates, features, and/or outcomes expected to be delivered over the course of multiple iterations.

Requirements management plan. This plan is a component of the project or program management plan that describes how requirements will be analyzed, documented, and managed.

Resource management plan. This plan is a component of the project management plan that describes how project resources are acquired, allocated, monitored, and controlled.

Risk management plan. This plan is a component of the project, program, or portfolio management plan that describes how risk management activities will be structured and performed.

Scope management plan. This plan is a component of the project or program management plan that describes how the scope will be defined, developed, monitored, controlled, and validated.

COMMONLY USED ARTIFACTS – Plan

Schedule management plan. This plan is a component of the project or program management plan that establishes the criteria and the activities for developing, monitoring, and controlling the schedule.

Stakeholder engagement plan. This plan is a component of the project management plan that identifies the strategies and actions required to promote productive involvement of stakeholders in project or program decision making and execution.

Test plan. This document describes deliverables that will be tested, tests that will be conducted, and the processes that will be used in testing. It forms the basis for formally testing the components and deliverables.

COMMONLY USED ARTIFACTS – Hierarchy Charts

Hierarchy charts begin with high level information that is progressively decomposed into greater levels of detail. The information at the upper levels encompasses all the information at the lower or subsidiary levels. Hierarchy charts are often progressively elaborated into greater levels of detail as more information is known about the project.

Organizational breakdown structure. This chart is a hierarchical representation of the project organization, which illustrates the relationship between project activities and the organizational units that will perform those activities.

Product breakdown structure. This chart is a hierarchical structure reflecting a product's components and deliverables.

Resource breakdown structure. This chart is a hierarchical representation of resources by category and type.
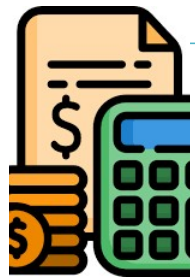
COMMONLY USED ARTIFACTS – Hierarchy Charts

Risk breakdown structure. This chart is a hierarchical representation of potential sources of risks.

Work breakdown structure. This chart is a hierarchical decomposition of the total scope of work to be carried out by the project team to accomplish the project objectives and create the required deliverables.

COMMONLY USED ARTIFACTS – Hierarchy Charts

Risk breakdown structure. This chart is a hierarchical representation of potential sources of risks.

Work breakdown structure. This chart is a hierarchical decomposition of the total scope of work to be carried out by the project team to accomplish the project objectives and create the required deliverables.

COMMONLY USED ARTIFACTS – Baselines

A baseline is the approved version of a work product or plan. Actual performance is compared to baselines to identify variances.

Budget. A budget is the approved estimate for the project or any work breakdown structure (WBS) component or any schedule activity.

**Milestone schedule.** This type of schedule presents milestones with planned dates.

Performance measurement baseline. Integrated scope, schedule, and cost baselines are used for comparison to manage, measure, and control project execution.

COMMONLY USED ARTIFACTS – Baselines

A baseline is the approved version of a work product or plan. Actual performance is compared to baselines to identify variances.

Project schedule. A project schedule is an output of a schedule model that presents linked activities with planned dates, durations, milestones, and resources.
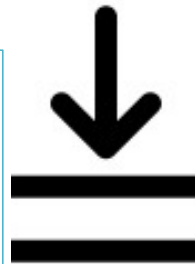
Scope baseline. This baseline is the approved version of a scope stamen, work breakdown structure (WBS), and its associated WBS dictionary that can be changed using formal change control procedures and is used as the basis for comparison to actual results.

COMMONLY USED ARTIFACTS – Visual Data & Information

Visual data and information are artifacts that organize and present data and information in a visual format, such as charts, graphs, matrices, and diagrams. Visualizing data makes it easier to absorb data and turn it into information. Visualization artifacts are often produced after data have been collected and analyzed. These artifacts can aid in decision making and prioritization.
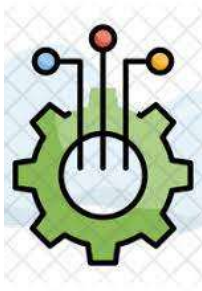
Affinity diagram. This diagram shows large number of ideas classified into groups for review and analysis.

Burn-down/Burnup chart. This chart is a graphical representation of the work remaining in a time-box or the work completed toward the release of a product or project deliverable.

COMMONLY USED ARTIFACTS – Visual Data & Information

Cause-and-Effect-Diagram. This diagram is a visual representation that helps trace an undesirable effect back to its root cause.

Cumulative Flow Diagram (CFD). This chart indicates features completed over time, features in development, and those in the backlog. It may also include features at intermediate states, such as features designed but not yet constructed those in quality assurance, or those in testing.
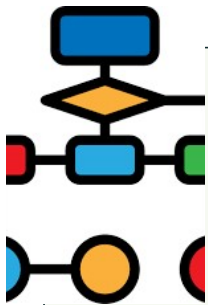
Cycle Time Chart. This diagram shows the average cycle time of the work items completed over time. a cycle time chart may be shown as a scatter diagram or a bar chart.

Dashboards. This set of charts and graphs shows progress or performance against important measures of the project.

COMMONLY USED ARTIFACTS – Visual Data & Information

Flow chart. This diagram depicts the inputs, process actions, and outputs of one or more processes within a system.

Gantt chart. This bar chart provides schedule information where activities are listed on the vertical axis, dates are shown on the horizontal axis, and activity durations are shown as horizontal bars placed according to start and finish dates.
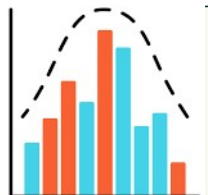
Histogram. This bar chart shows the graphical representation of numerical data.

Information radiator. This artifact is a visible, physical display that provides information to the rest of the organization, enabling timely knowledge sharing.
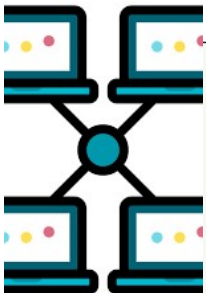
Lead time chart. This diagram shows the trend over time of the average lead time of the items completed in work. A lead time chart may be shown as a scatter diagram or a bar chart.

Prioritization matrix. This matrix is a scatter diagram where effort is shown on the horizontal axis and value on the vertical axis, divided into four quadrants to classify items by priority.
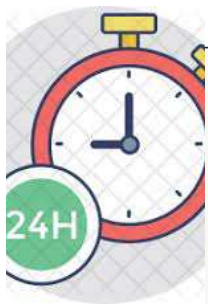
Project schedule network diagram. This graphical representation shows the logical relationships among the project schedule activities.
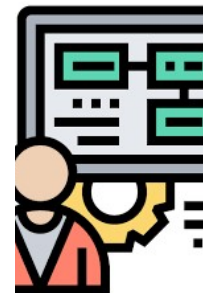
Requirements traceability matrix. This matrix links product requirements from their origin to the deliverables that satisfy them.

COMMONLY USED ARTIFACTS – Visual Data & Information

Responsibility Assignment Matrix (RAM). This matrix is a grid that shows the project resources assigned to each work package. A RACI chart is a common way of showing stakeholders who are responsible, accountable, consulted, or informed and are associated with project activities, decisions, and deliverables.
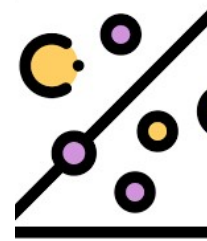
Scatter Diagram. This graph shows the relationship between two variables.

S-curve. This graph displays cumulative costs over a specified period of time.

time

Stakeholder engagement assessment matrix. This matrix compares current and desired stakeholder engagement levels.

Story map. A story map is a visual model of all the features and functionality desired for a given product, created to give the project team a holistic view of what they are building and why.

Throughput chart. This chart shows the accepted deliverables over time. a throughput chart may be shown as a scatter diagram or a bar chart.

COMMONLY USED ARTIFACTS – Visual Data & Information

Use case. This artifact describes and explores how a user interacts with a system to achieve a specific goal.

Value stream map. This is a lean enterprise method used to document, analyze, and improve the flow of information or materials required to produce a product or service for a customer. Value stream maps can be used to identify waste.

Velocity chart. This chart tracks the rate at which the deliverables are produced, validated, and accepted within a predefined interval.

COMMONLY USED ARTIFACTS – Report

Reports are formal records or summaries of information. Reports communicate relevant (usually summary level) information to stakeholders. Often reports are given to stakeholders who are interested in the project status, such as sponsors, business owners, or PMOs.

Quality report. This project document includes quality management issues, recommendations for corrective actions, and a summary of findings from quality control activities. It may include recommendations for process, project, and product improvements.

Risk report. This project document is developed progressively throughout the risk management processes and summarizes information on individual project risks and the level of overall project risk.

Status report. This document provides a report on the current status of the project. It may include information on progress since the last report and forecasts for cost and schedule performance.

An agreement is any document or communication that defines the intentions of the parties. In projects, agreements take the form of contracts or other defined understandings. A contract is a mutually binding agreement that obligates the seller to provide the specified product, service, or result and obligates the buyer to pay for it. There are different types of contracts, some of which fall which a category of fixed price or cost reimbursable contracts.

Fixed price contracts. This category of contract involves setting a fixed price for a well defined product, service, or result. Fixed price contracts include firm fixed price (FFP), fixed price incentive (FPIF), and fixed price with economic price adjustment (FP-EPA),

Cost-reimbursable contracts. This category of contracts involves payments to the seller for actual costs incurred for completing the work plus a free representing seller profit. These contracts are often used when the project scope is not well defined or is subject to frequent change. Cost-reimbursable contracts include cost plus aware fee (CPAF), cost plus fixed free (CPFF), and cost plus incentive (CPIF).

COMMONLY USED ARTIFACTS – Agreements and Contracts

Time and material (T&M). This contract establishes a fixed rate, but not a precise statement of work. It can be used for staff augmentation, subject matter expertise, or other outside support.

Indefinite delivery indefinite quantity (IDIQ). This contract provides for an indefinite quantity of goods or services, with a stated lower and upper limit, and within a fixed time period. These contracts can be used for architectural, engineering, or information technology engagements.

Other agreements. Other types of agreements include memorandum of understanding (MOU), memorandum of agreement (MOA), service level agreement (SLA), basic ordering agreement (BOA), among others.

COMMONLY USED ARTIFACTS – Other Artifacts

The documents and deliverables described here do not fit into a specific category; however, they are important artifacts that are used for a variety of purposes.

Activity list. This document provides a tabulation of schedule activities that shows the activity description, activity identifier, and a sufficiently detailed scope of work description so project team members understand what work is to be performed.

Bid documents. Bid documents are used to request proposals from prospective sellers. Depending on the goods or services needed, bid documents can include, among others:

* Request for information (RFI),

* Request for quotation (RFQ), and

* Request for proposal (RFP).

Metrics. Metrics describe an attribute and how to measure it.

COMMONLY USED ARTIFACTS – Other Artifacts

Project calendar. This calendar identifies working days and shifts that are available for scheduled activities.

Requirements documentation. This document is a record of product requirements and relevant information needed to manage the requirements, which includes the associated category, priority, and acceptance criteria.

Project team charter. This document records the project team values, agreements, and operating guidelines, and establishes clear expectations regarding acceptable behavior by project team members.

User story. A user story is a brief description of an outcome for a specific user, which is a promise of a conversation to clarify details.

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COMMONLY USED ARTIFACTS – Other Artifacts

Different artifacts are more likely to be useful in different performance domains. While the delivery approach, product, and organizational environment will determine which artifacts are most applicable for a specific project, there are some performance domains that are most likely to make use of specific artifacts. Table 3 suggest the performance domain (s) where each artifact is more likely to be of use; however, the project manager and/or project team has the ultimate responsibility for selecting and tailoring the artifacts for their project.

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COMMONLY USED ARTIFACTS – Other Artifacts

Table 4-3. Mapping of Artifacts Likely to Be Used in Each Performance Domain

Artifact	Team	Stakeholders	Dev Approach and Life Cycle	Planning	Project Work	Delivery	Measurement	Uncertainty
Strategy Artifacts:								
Business case		X		X				
Project brief		X		X				
Project charter		X		X				
Project vision statement		X		X				
Roadmap		X	X	X				
Log and Register Artifacts:								
Assumption log				X	X	X		X
Backlog				X	X	X		
Change log					X	X		
Issue log					X			
Lessons learned register					X			
Risk-adjusted backlog				X				X
Risk register				X	X	X		X
Stakeholder register		X		X				
Plan Artifacts:								
Change control plan				X	X	X		
Communications management plan		X		X	X			
Cost management plan				X				
Iteration plan				X				
Procurement management plan				X	X			
Project management plan		X		X	X			
Quality management plan				X	X	X		
Release plan				X		X		
Requirements management plan				X		X		
Resource management plan				X	X			
Risk management plan				X	X			X
Scope management plan				X		X		

COMMONLY USED ARTIFACTS – Other Artifacts

Table 4-3. Mapping of Artifacts Likely to Be Used in Each Performance Domain (cont.)

Artifact	Team	Stakeholders	Dev Approach and Life Cycle	Planning	Project Work	Delivery	Measurement	Uncertainty
Schedule management plan				X	X	X		
Stakeholder engagement plan		X		X				
Test plan				X	X	X	X	
Hierarchy Chart Artifacts:								
Organizational breakdown structure	X	X		X				
Product breakdown structure				X		X		
Resource breakdown structure	X			X	X		X	
Risk breakdown structure					X			X
Work breakdown structure				X		X	X	
Baseline Artifacts:								
Budget				X	X		X	
Milestone schedule			X	X	X		X	
Performance measurement baseline				X	X	X	X	
Project schedule				X	X		X	
Scope baseline				X	X	X	X	
Visual Data and Information Artifacts:								
Affinity diagram				X	X			
Burn chart				X		X	X	
Cause-and-effect diagram					X	X		X
Cycle time chart						X	X	
Cumulative flow diagram						X	X	
Dashboard					X		X	
Flow chart				X	X	X		
Gantt chart				X	X		X	
Histogram							X	
Information radiator					X		X	
Lead time chart						X	X	
Prioritization matrix		X		X	X			

COMMONLY USED ARTIFACTS – Other Artifacts

Table 4-3. Mapping of Artifacts Likely to Be Used in Each Performance Domain (cont.)

Artifact	Performance Domain							
	Team	Stakeholders	Dev Approach and Life Cycle	Planning	Project Work	Delivery	Measurement	Uncertainty
Project schedule network diagram				X	X			
Requirements traceability matrix				X		X	X	
Responsibility assignment matrix				X	X			
Scatter diagram					X	X	X	
S-curve				X			X	
Stakeholder engagement assessment matrix		X		X	X			
Story map				X		X		
Throughput chart						X	X	
Use case				X		X		
Value stream map					X	X	X	
Velocity chart						X	X	
Report Artifacts:								
Quality report					X	X	X	
Risk report					X			X
Status report					X			
Agreements and Contracts:								
Fixed-price		X		X	X	X	X	X
Cost-reimbursable		X		X	X	X	X	X
Time and materials		X		X	X	X	X	X
Indefinite time indefinite quantity (IDIQ)		X		X	X	X	X	X
Other agreements		X		X	X	X	X	X
Other Artifacts:								
Activity list	X	X		X	X			
Bid documents		X		X	X			
Metrics				X		X	X	
Project calendars	X			X	X			
Requirements documentation		X		X		X	X	
Project team charter	X				X			
User story		X		X		X		