10

PROJECT COMMUNICATIONS MANAGEMENT

Project Communications Management includes the processes necessary to ensure that the information needs of the project and its stakeholders are met through development of artifacts and implementation of activities designed to achieve effective information exchange. Project Communications Management consists of two parts. The first part is developing a strategy to ensure communication is effective for stakeholders. The second part is carrying out the activities necessary to implement the communication strategy.

The Project Communications Management processes are:

10.1 Plan Communications Management—The process of developing an appropriate approach and plan for project communication activities based on the information needs of each stakeholder or group, available organizational assets, and the needs of the project.

10.2 Manage Communications—The process of ensuring timely and appropriate collection, creation, distribution, storage, retrieval, management, monitoring, and the ultimate disposition of project information.

10.3 Monitor Communications—The process of ensuring the information needs of the project and its stakeholders are met.

Figure 10-1 provides an overview of the Project Communications Management processes. The Project Communications Management processes are presented as discrete processes with defined interfaces while, in practice, they overlap and interact in ways that cannot be completely detailed in the *PMBOK® Guide*.

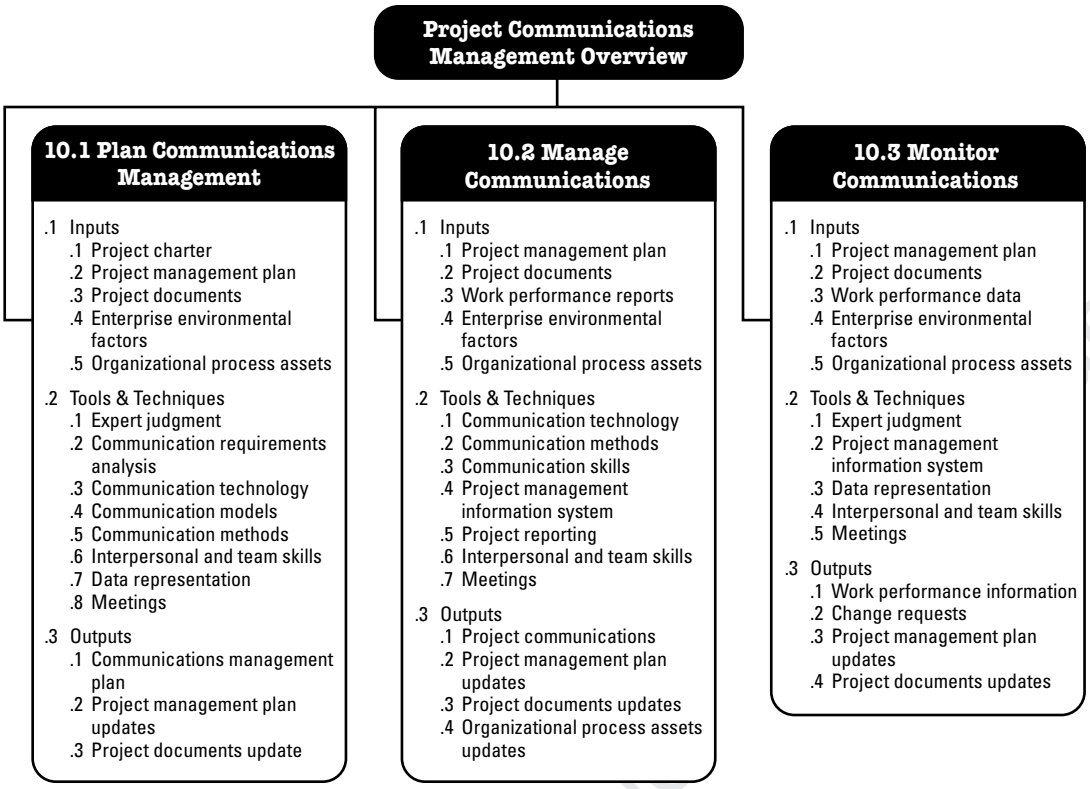

Figure 10-1. Project Communications Overview

KEY CONCEPTS FOR PROJECT COMMUNICATIONS MANAGEMENT

Communication is the exchange of information, intended or involuntary. The information exchanged can be in the form of ideas, instructions, or emotions. The mechanisms by which information is exchanged can be in:

- **Written form.** Either physical or electronic.
- **Spoken.** Either face-to-face or remote.
- **Formal or informal** (as in formal papers or social media).
- **Through gestures.** Tone of voice and facial expressions.
- **Through media**. Pictures, actions, or even just the choice of words.
- **Choice of words.** There is often more than one word to express an idea; there can be subtle differences in the meaning of each of these words and phrases.

Communications describe the possible means by which the information can be sent or received, either through communication activities, such as meetings and presentations, or artifacts, such as emails, social media, project reports, or project documentation.

Project managers spend most of their time communicating with team members and other project stakeholders, both internal (at all organizational levels) and external to the organization. Effective communication builds a bridge between diverse stakeholders who may have different cultural and organizational backgrounds as well as different levels of expertise, perspectives, and interests.

Communication activities have many dimensions, including but not limited to:

- **Internal.** Focus on stakeholders within the project and within the organization.
- **External.** Focus on external stakeholders such as customers, vendors, other projects, organizations, government, the public, and environmental advocates.
- **Formal.** Reports, formal meetings (both regular and ad hoc), meeting agendas and minutes, stakeholder briefings, and presentations.
- **Informal.** General communications activities using emails, social media, websites, and informal ad hoc discussions.
- **Hierarchical focus.** The position of the stakeholder or group with respect to the project team will affect the format and content of the message, in the following ways:
  - *Upward.* Senior management stakeholders.
  - *Downward.* The team and others who will contribute to the work of the project.
  - *Horizontal.* Peers of the project manager or team.
- **Official.** Annual reports; reports to regulators or government bodies.
- **Unofficial.** Communications that focus on establishing and maintaining the profile and recognition of the project and building strong relationships between the project team and its stakeholders using flexible and often informal means.
- **Written and oral.** Verbal (words and voice inflections) and nonverbal (body language and actions), social media and websites, media releases.

Communication develops the relationships necessary for successful project and program outcomes. Communication activities and artifacts to support communication vary widely, ranging from emails and informal conversations to formal meetings and regular project reports. The act of sending and receiving information takes place consciously or unconsciously through words, facial expressions, gestures and other actions. In the context of successfully managing project relationships with stakeholders, communication includes developing strategies and plans for suitable communications artifacts and activities with the stakeholder community and the application of skills to enhance the effectiveness of the planned and other ad hoc communications.

There are two parts to successful communication. The first part involves developing an appropriate communication strategy based on both the needs of the project and the project's stakeholders. From that strategy, a communications management plan is developed to ensure that the appropriate messages are communicated to stakeholders in various formats and various means as defined by the communication strategy. These messages constitute the project's communications—the second part of successful communication. Project communications are the products of the planning process, addressed by the communications management plan that defines the collection, creation, dissemination, storage, retrieval, management, tracking, and disposition of these communications artifacts. Finally, the communication strategy and communications management plan will form the foundation to monitor the effect of the communication.

The project's communications are supported by efforts to prevent misunderstandings and miscommunication and by careful selection of the methods, messengers, and messages developed from the planning process.

Misunderstandings can be reduced but not eliminated through using the 5Cs of written communications in composing a traditional (non-social media) written or spoken message:

- **Correct grammar and spelling.** Poor use of grammar or inaccurate spelling can be distracting and can also introduce distortions in the message, diminishing credibility.
- **Concise expression and elimination of excess words.** A concise, well-crafted message reduces the opportunities for misunderstanding the intent of the message.
- **Clear purpose and expression directed to the needs of the reader.** Ensure that the needs and interests of the audience are factored into the message.
- **Coherent logical flow of ideas.** A coherent logical flow of ideas and using "markers" such as introduction and summaries of the ideas throughout the writing.
- **Controlling flow of words and ideas.** Controlling the flow of words and ideas may involve graphics or just summaries.

The 5Cs of written communications are supported by communication skills, such as:

- **Listening actively.** Staying engaged with the speaker and summarizing conversations to ensure effective information exchange.
- **Awareness of cultural and personal differences.** Developing the team's awareness of cultural and personal differences to reduce misunderstandings and enhance communication capability.
- **Identifying, setting, and managing stakeholder expectations.** Negotiating with stakeholders reduces the existence of conflicting expectations among the stakeholder community.
- **Enhancement of skills**. Enhancing the skills of all team members in the following activities:
  - Persuading a person, a team, or an organization to perform an action;
  - Motivating people and providing encouragement or reassurance;
  - Coaching to improve performance and achieve desired results;
  - Negotiating to achieve mutually acceptable agreements between parties and reduce approval or decision delays; and
  - Resolving conflict to prevent disruptive impacts.

The fundamental attributes of effective communication activities and developing effective communication artifacts are:

- Clarity on the purpose of the communication—defining its purpose;
- Understanding as much as possible about the receiver of the communications, meeting needs, and preferences; and
- Monitoring and measuring the effectiveness of the communications.

TRENDS AND EMERGING PRACTICES IN PROJECT COMMUNICATIONS MANAGEMENT

Along with a focus on stakeholders and recognition of the value to projects and organizations of effective stakeholder engagement comes the recognition that developing and implementing appropriate communication strategies is vital to maintaining effective relationships with stakeholders. Trends and emerging practices for Project Communications Management include but are not limited to:

- **Inclusion of stakeholders in project reviews.** The stakeholder community of each project includes individuals, groups, and organizations that the project team has identified as essential to the successful delivery of project objectives and organizational outcomes. An effective communication strategy requires regular and timely reviews of the stakeholder community and updates to manage changes in its membership and attitudes.
- **Inclusion of stakeholders in project meetings.** Project meetings should include stakeholders from outside the project and even the organization, where appropriate. Practices inherent in the agile approaches can be applied to all types of projects. Practices often include short, daily standup meetings, where the achievements and issues of the previous day, and plans for the current day's work, are discussed with the project team and key stakeholders.
- **Increased use of social computing.** Social computing in the form of infrastructure, social media services, and personal devices has changed how organizations and their people communicate and do business. Social computing incorporates different approaches to collaboration supported by public IT infrastructure. Social networking refers to how users build networks of relationships to explore their interests and activities with others. Social media tools can not only support information exchange, but also build relationships accompanied by deeper levels of trust and community.
- **Multifaceted approaches to communication.** The standard communication strategy for project stakeholder communications embraces and selects from all technologies and respects cultural, practical, and personal preferences for language, media, content, and delivery. When appropriate, social media and other advanced computing technologies may be included. Multifaceted approaches such as these are more effective for communicating to stakeholders from different generations and cultures.

TAILORING CONSIDERATIONS

Because each project is unique, the project team will need to tailor the way that Project Communications Management processes are applied. Considerations for tailoring include but are not limited to:

- **Stakeholders.** Are the stakeholders internal or external to the organization, or both?
- **Physical location.** What is the physical location of team members? Is the team colocated? Is the team in the same geographical area? Is the team distributed across multiple time zones?
- **Communications technology.** What technology is available to develop, record, transmit, retrieve, track, and store communication artifacts? What technologies are most appropriate and cost effective for communicating to stakeholders?
- **Language.** Language is a main factor to consider in communication activities. Is one language used? Or are many languages used? Have allowances been made to adjust to the complexity of team members from diverse language groups?
- **Knowledge management.** Does the organization have a formal knowledge management repository? Is the repository used?

CONSIDERATIONS FOR AGILE/ADAPTIVE ENVIRONMENTS

Project environments subject to various elements of ambiguity and change have an inherent need to communicate evolving and emerging details more frequently and quickly. This motivates streamlining team member access to information, frequent team checkpoints, and colocating team members as much as possible.

In addition, posting project artifacts in a transparent fashion, and holding regular stakeholder reviews are intended to promote communication with management and stakeholders.

10.1 PLAN COMMUNICATIONS MANAGEMENT

Plan Communications Management is the process of developing an appropriate approach and plan for project communications activities based on the information needs of each stakeholder or group, available organizational assets, and the needs of the project. The key benefit of this process is a documented approach to effectively and efficiently engage stakeholders by presenting relevant information in a timely manner. This process is performed periodically throughout the project as needed. The inputs, tools and techniques, and outputs of the process are depicted in Figure 10-2. Figure 10-3 depicts the data flow diagram for the process.

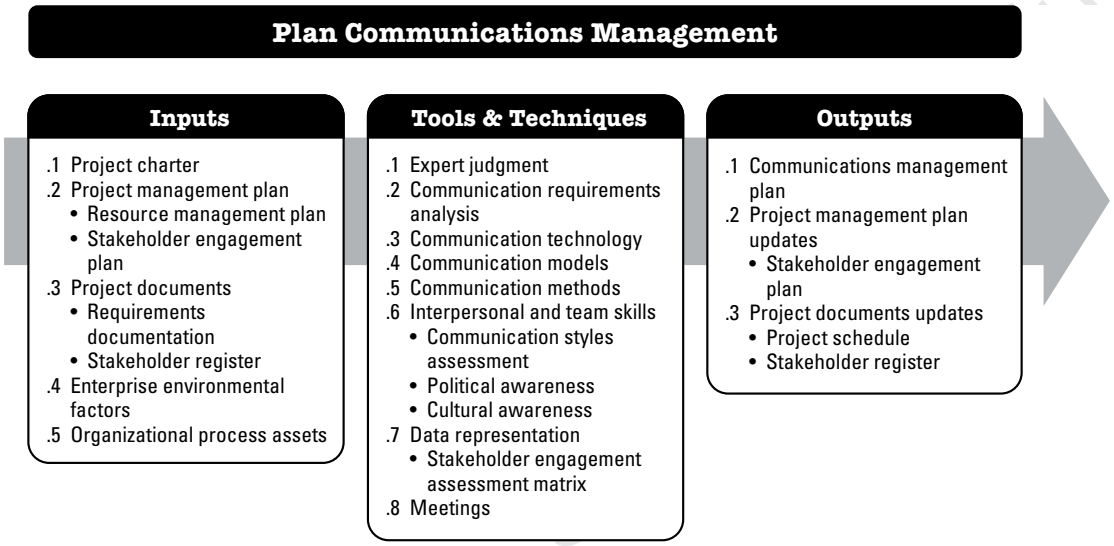

Figure 10-2. Plan Communications Management: Inputs, Tools & Techniques, and Outputs

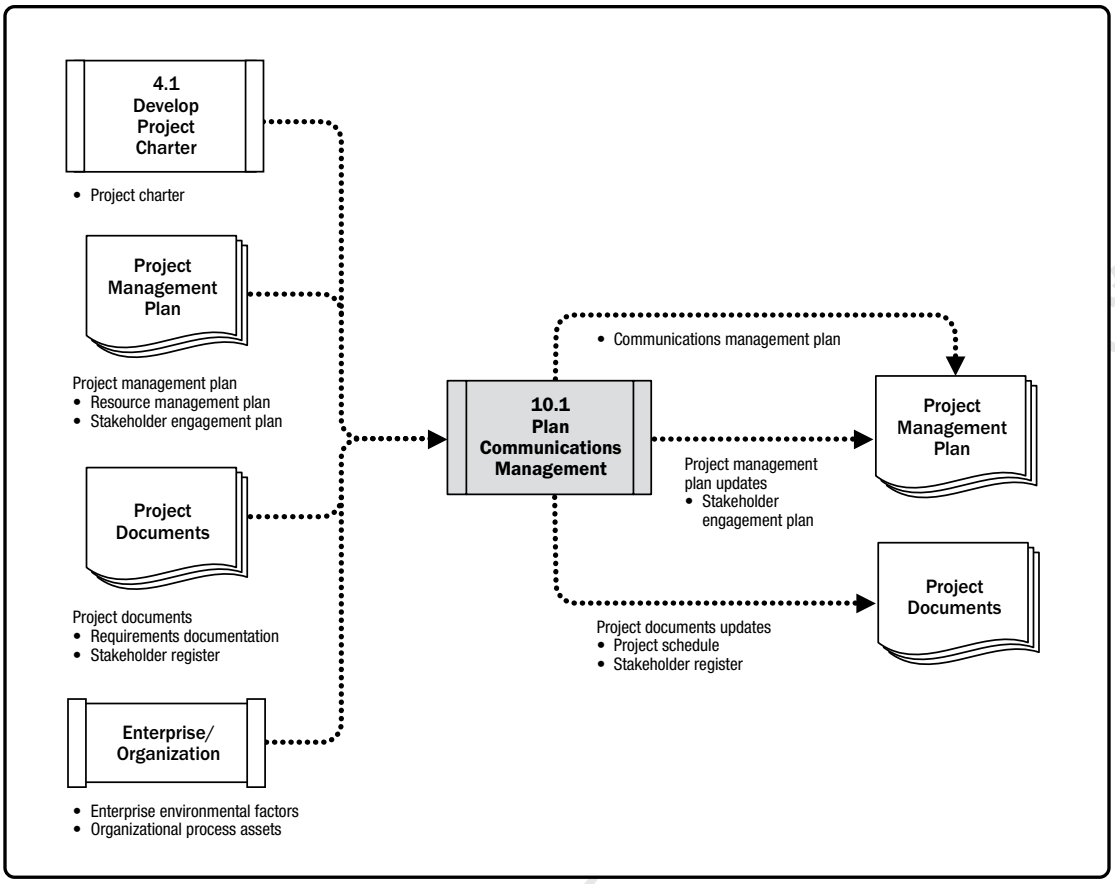

Figure 10-3. Plan Communications Management: Data Flow Diagram

An effective communications management plan that recognizes the diverse information needs of the project's stakeholders is developed early in the project life cycle. It should be reviewed regularly and modified when necessary, when the stakeholder community changes or at the start of each new project phase.

On most projects, communications planning is performed very early, during stakeholder identification and project management plan development.

While all projects share the need to communicate project information, the information needs and methods of distribution may vary widely. In addition, the methods of storage, retrieval, and ultimate disposition of the project information need to be considered and documented during this process. The results of the Plan Communications Management process should be reviewed regularly throughout the project and revised as needed to ensure continued applicability.

10.1.1 PLAN COMMUNICATIONS MANAGEMENT: INPUTS

10.1.1.1 PROJECT CHARTER

Described in Section 4.1.3.1. The project charter identifies the key stakeholder list. It may also contain information about the roles and responsibilities of the stakeholders.

10.1.1.2 PROJECT MANAGEMENT PLAN

Described in Section 4.2.3.1. Project management plan components include but are not limited to:

- **Resource management plan.** Described in Section 9.1.3.1. Provides guidance on how team resources will be categorized, allocated, managed, and released. Team members and groups may have communication requirements that should be identified in the communications management plan.
- **Stakeholder engagement plan.** Described in Section 13.2.3.1. The stakeholder engagement plan identifies the management strategies required to effectively engage stakeholders. These strategies are often fulfilled via communications.

10.1.1.3 PROJECT DOCUMENTS

Project documents that can be considered as inputs for this process include but are not limited to:

- **Requirements documentation.** Described in Section 5.2.3.1. Requirements documentation can include project stakeholder communications.
- **Stakeholder register.** Described in Section 13.1.3.1. The stakeholder register is used to plan communications activities with stakeholders.

10.1.1.4 ENTERPRISE ENVIRONMENTAL FACTORS

The enterprise environmental factors that can influence the Plan Communications Management process include but are not limited to:

- Organizational culture, political climate, and governance framework;
- Personnel administration policies;
- Stakeholder risk thresholds;
- Established communication channels, tools, and systems;
- Global, regional, or local trends, practices, or habits; and
- Geographic distribution of facilities and resources.

10.1.1.5 ORGANIZATIONAL PROCESS ASSETS

The organizational process assets that can influence the Plan Communications Management process include but are not limited to:

- Organizational policies and procedures for social media, ethics, and security;
- Organizational policies and procedures for issue, risk, change, and data management;
- Organizational communication requirements;
- Standardized guidelines for development, exchange, storage, and retrieval of information;
- Historical information and lessons learned repository; and
- Stakeholder and communications data and information from previous projects.

10.1.2 PLAN COMMUNICATIONS MANAGEMENT: TOOLS AND TECHNIQUES

10.1.2.1 EXPERT JUDGMENT

Described in Section 4.1.2.1. Expertise should be considered from individuals or groups with specialized knowledge or training in the following topics:

- Politics and power structures in the organization;
- Environment and culture of the organization and other customer organizations;
- Organizational change management approach and practices;
- Industry or type of project deliverables;
- Organizational communications technologies;
- Organizational policies and procedures regarding legal requirements of corporate communications;
- Organizational policies and procedures regarding security; and
- Stakeholders, including customers or sponsors.

10.1.2.2 COMMUNICATION REQUIREMENTS ANALYSIS

Analysis of communication requirements determines the information needs of the project stakeholders. These requirements are defined by combining the type and format of information needed with an analysis of the value of that information.

Sources of information typically used to identify and define project communication requirements include but are not limited to:

- Stakeholder information and communication requirements from within the stakeholder register and stakeholder engagement plan;
- Number of potential communication channels or paths, including one-to-one, one-to-many, and many-to-many communications;
- Organizational charts;
- Project organization and stakeholder responsibility, relationships, and interdependencies;
- Development approach;
- Disciplines, departments, and specialties involved in the project;
- Logistics of how many persons will be involved with the project and at which locations;
- Internal information needs (e.g., when communicating within organizations);
- External information needs (e.g., when communicating with the media, public, or contractors); and
- Legal requirements.

10.1.2.3 COMMUNICATION TECHNOLOGY

The methods used to transfer information among project stakeholders may vary significantly. Common methods used for information exchange and collaboration include conversations, meetings, written documents, databases, social media, and websites.

Factors that can affect the choice of communication technology include:

- **Urgency of the need for information.** The urgency, frequency, and format of the information to be communicated may vary from project to project and also within different phases of a project.
- **Availability and reliability of technology. T**he technology that is required for distribution of project communications artifacts should be compatible, available, and accessible for all stakeholders throughout the project.
- **Ease of use.** The choice of communication technologies should be suitable for project participants and proper training events should be planned, where appropriate.

- **Project environment.** Whether the team will meet and operate on a face-to-face basis or in a virtual environment; whether they will be located in one or multiple time zones; whether they will use multiple languages for communication; and finally, whether there are any other project environmental factors, such as various aspects of culture, which may constrain the efficiency of the communication.
- **Sensitivity and confidentiality of the information.** Some aspects to consider are:
  - Whether information to be communicated is sensitive or confidential. If so, additional security measures may be required.
  - Social media policies for employees to ensure appropriate behavior, security, and the protection of proprietary information.

10.1.2.4 COMMUNICATION MODELS

Communication models can represent the communication process in its most basic linear form (sender and receiver), in a more interactive form that encompasses the additional element of feedback (sender, receiver, and feedback), or in a more complex model that incorporates the human elements of the sender(s) or receiver(s) and attempts to show the complexity of any communication that involves people.

- **Sample basic sender/receiver communication model.** This model describes communication as a process and consists of two parties, defined as the sender and receiver. This model is concerned with ensuring that the message is delivered, rather than understood. The sequence of steps in a basic communication model is:
  - *Encode.* The message is coded into symbols, such as text, sound or some other medium for transmission (sending).
  - *Transmit message.* The message is sent via a communication channel. The transmission of this message may be compromised by various physical factors such as unfamiliar technology or inadequate infrastructure. Noise and other factors may be present and contribute to loss of information in transmission and/or reception of the message.
  - *Decode.* The data received is translated by the receiver back into a form useful to the receiver.

- **Sample interactive communication model.** This model also describes communication as a process consisting of two parties, the sender and receiver, but recognizes the need to ensure that the message has been understood. In this model, noise includes any interference or barriers that might compromise the understanding of the message, such as the distraction of the receiver, variations in the perceptions of receivers, or lack of appropriate knowledge or interest. The additional steps in an interactive communication model are:
  - *Acknowledge*. Upon receipt of a message, the receiver may signal (acknowledge) receipt of the message, but this does not necessarily mean agreement with or comprehension of the message—merely that it has been received.
  - *Feedback/response.* When the received message has been decoded and understood, the receiver encodes thoughts and ideas into a message and then transmits this message to the original sender. If the sender perceives that the feedback matches the original message, the communication has been successful. In communication between people, feedback can be achieved through active listening, described in Section 10.2.2.6.

  As part of the communication process, the sender is responsible for the transmission of the message, ensuring the information being communicated is clear and complete, and confirming the message is correctly interpreted. The receiver is responsible for ensuring that the information is received in its entirety, interpreted correctly, and acknowledged or responded to appropriately. These components take place in an environment where there will likely be noise and other barriers to effective communication.

Cross-cultural communication presents challenges to ensuring that the meaning of the message has been understood. Differences in communication styles can arise from differences in working methods, age, nationality, professional discipline, ethnicity, race, or gender. People from different cultures communicate using different languages (e.g., technical design documents, different styles) and expect different processes and protocols.

The communication model shown in Figure 10-4 incorporates the idea that the message itself and how it is transmitted are influenced by the sender's current emotional state, knowledge, background, personality, culture, and biases. Similarly, the receiver's emotional state knowledge, background, personality, culture, and biases will influence how the message is received and interpreted, and will contribute to the barriers or noise.

This communication model and its enhancements can assist in developing communication strategies and plans for person-to-person or even small group to small group communications. It is not useful for other communications artifacts such as emails, broadcast messages, or social media.

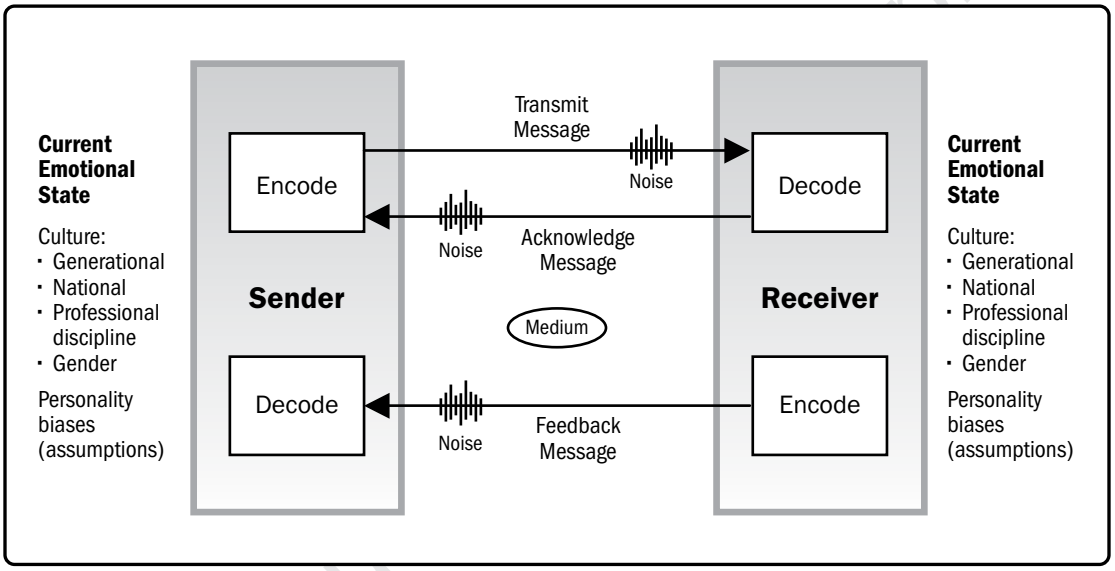

Figure 10-4. Communication Model for Cross-Cultural Communication

10.1.2.5 COMMUNICATION METHODS

There are several communication methods that are used to share information among project stakeholders. These methods are broadly classified as follows:

- **Interactive communication.** Between two or more parties performing a multidirectional exchange of information in real time. It employs communications artifacts such as meetings, phone calls, instant messaging, some forms of social media, and videoconferencing.
- **Push communication.** Sent or distributed directly to specific recipients who need to receive the information. This ensures that the information is distributed but does not ensure that it actually reached or was understood by the intended audience. Push communications artifacts include letters, memos, reports, emails, faxes, voice mails, blogs, and press releases.
- **Pull communication.** Used for large complex information sets, or for large audiences, and requires the recipients to access content at their own discretion subject to security procedures. These methods include web portals, intranet sites, e-learning, lessons learned databases, or knowledge repositories.

Different approaches should be applied to meet the needs of the major forms of communication defined in the communications management plan:

- **Interpersonal communication.** Information is exchanged between individuals, typically face-to-face.
- **Small group communication.** Occurs within groups of around three to six people.
- **Public communication.** A single speaker addressing a group of people.
- **Mass communication.** There is a minimal connection between the person or group sending the message and the large, sometimes anonymous groups for whom the information is intended.
- **Networks and social computing communication.** Supports emerging communication trends of many-to-many supported by social computing technology and media.

Possible communications artifacts and methods include but are not limited to:

- Notice boards,
- Newsletters/in-house magazines/e-magazines,
- Letters to staff/volunteers,
- Press releases,
- Annual reports,
- Emails and intranets,
- Web portals and other information repositories (for pull communication)
- Phone conversations,
- Presentations,
- Team briefings/group meetings,
- Focus groups,
- Face-to-face formal or informal meetings between various stakeholders,
- Consultation groups or staff forums, and
- Social computing technology and media.

10.1.2.6 INTERPERSONAL AND TEAM SKILLS

Interpersonal and team skills that can be used for this process include but are not limited to:

- **Communication styles assessment.** A technique used to assess communication styles and identify the preferred communication method, format, and content for planned communication activities. Often used with unsupportive stakeholders, this assessment may follow a stakeholder engagement assessment (described in Section 13.2.2.5) to identify gaps in stakeholder engagement that require additional tailored communication activities and artifacts.

- **Political awareness.** Political awareness helps the project manager to plan communications based on the project environment as well as the organization's political environment. Political awareness concerns the recognition of power relationships, both formal and informal, and also the willingness to operate within these structures. An understanding of the strategies of the organization, knowing who wields power and influence in this arena, and developing an ability to communicate with these stakeholders are all aspects of political awareness.
- **Cultural awareness.** Cultural awareness is an understanding of the differences between individuals, groups, and organizations and adapting the project's communication strategy in the context of these differences. This awareness and any consequent actions minimize misunderstandings and miscommunication that may result from cultural differences within the project's stakeholder community. Cultural awareness and cultural sensitivity help the project manager to plan communications based on the cultural differences and requirements of stakeholders and team members.

10.1.2.7 DATA REPRESENTATION

A data representation technique that can be used for this process includes but is not limited to a stakeholder engagement assessment matrix. Described in Section 13.2.2.5. The stakeholder engagement assessment matrix, shown in Figure 13-6, displays gaps between current and desired engagement levels of individual stakeholders, it can be further analyzed in this process to identify additional communication requirements (beyond the regular reports) as a method to close any engagement level gaps.

10.1.2.8 MEETINGS

Project meetings can include virtual (e-meetings) or face-to-face meetings, and can be supported with document collaboration technologies, including email messages and project websites. The Plan Communications Management process requires discussion with the project team to determine the most appropriate way to update and communicate project information, and to respond to requests from various stakeholders for information.

10.1.3 PLAN COMMUNICATIONS MANAGEMENT: OUTPUTS

10.1.3.1 COMMUNICATIONS MANAGEMENT PLAN

The communications management plan is a component of the project management plan that describes how project communications will be planned, structured, implemented, and monitored for effectiveness. The plan contains the following information:

- Stakeholder communication requirements;
- Information to be communicated, including language, format, content, and level of detail;
- Escalation processes;
- Reason for the distribution of that information;
- Timeframe and frequency for the distribution of required information and receipt of acknowledgment or response, if applicable;
- Person responsible for communicating the information;
- Person responsible for authorizing release of confidential information;
- Person or groups who will receive the information, including information about their needs, requirements, and expectations;
- Methods or technologies used to convey the information, such as memos, email, press releases, or social media;
- Resources allocated for communication activities, including time and budget;
- Method for updating and refining the communications management plan as the project progresses and develops, such as when the stakeholder community changes as the project moves through different phases;
- Glossary of common terminology;
- Flow charts of the information flow in the project, workflows with possible sequence of authorization, list of reports, meeting plans, etc.; and
- Constraints derived from specific legislation or regulation, technology, organizational policies, etc.

The communications management plan can include guidelines and templates for project status meetings, project team meetings, e-meetings, and email messages. The use of a project website and project management software can be included if these are to be used in the project.

10.1.3.2 PROJECT MANAGEMENT PLAN UPDATES

Any change to the project management plan goes through the organization's change control process via a change request. Components that may require a change request for the project management plan include but are not limited to the stakeholder engagement plan, which is described in Section 13.2.3.1. The stakeholder engagement plan is updated to reflect any processes, procedures, tools, or techniques that affect the engagement of stakeholders in project decisions and execution.

10.1.3.3 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of carrying out this process include but are not limited to:

- **Project schedule.** Described in Section 6.5.3.2. The project schedule may be updated to reflect communication activities.
- **Stakeholder register.** Described in Section 13.1.3.1.The stakeholder register may be updated to reflect communications planned.

10.2 MANAGE COMMUNICATIONS

Manage Communications is the process of ensuring timely and appropriate collection, creation, distribution, storage, retrieval, management, monitoring, and the ultimate disposition of project information. The key benefit of this process is that it enables an efficient and effective information flow between the project team and the stakeholders. This process is performed throughout the project.

The Manage Communications process identifies all aspects of effective communication, including choice of appropriate technologies, methods, and techniques. In addition, it should allow for flexibility in the communications activities, allowing adjustments in the methods and techniques to accommodate the changing needs of stakeholders and the project. The inputs, tools, techniques, and outputs of this process are depicted in Figure 10-5. Figure 10-6 depicts the data flow diagram of the Manage Communications process.

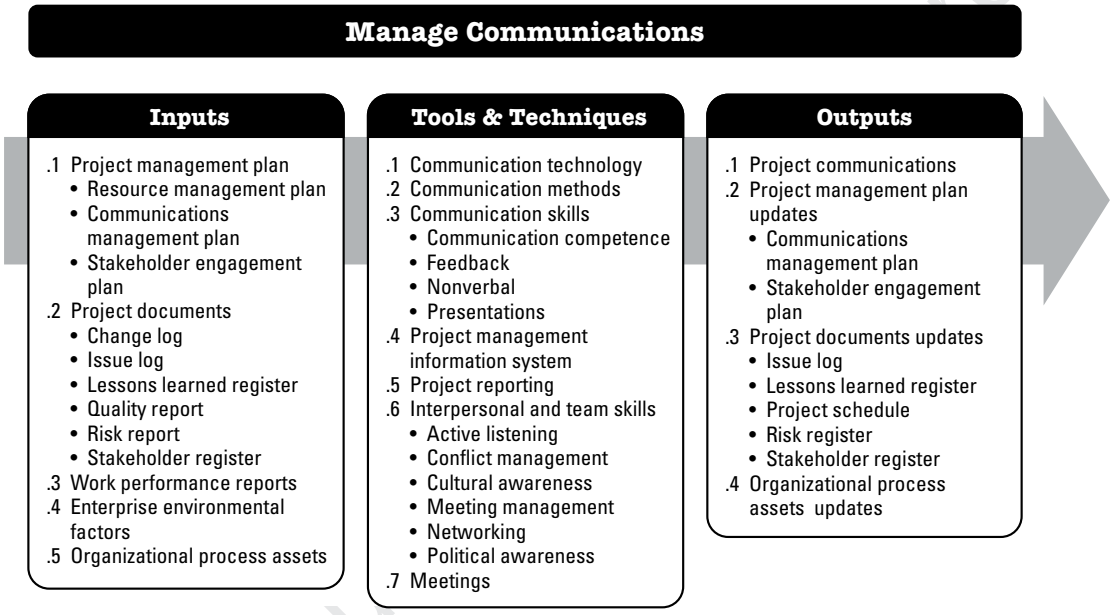

Figure 10-5. Manage Communications: Inputs, Tools & Techniques, and Outputs

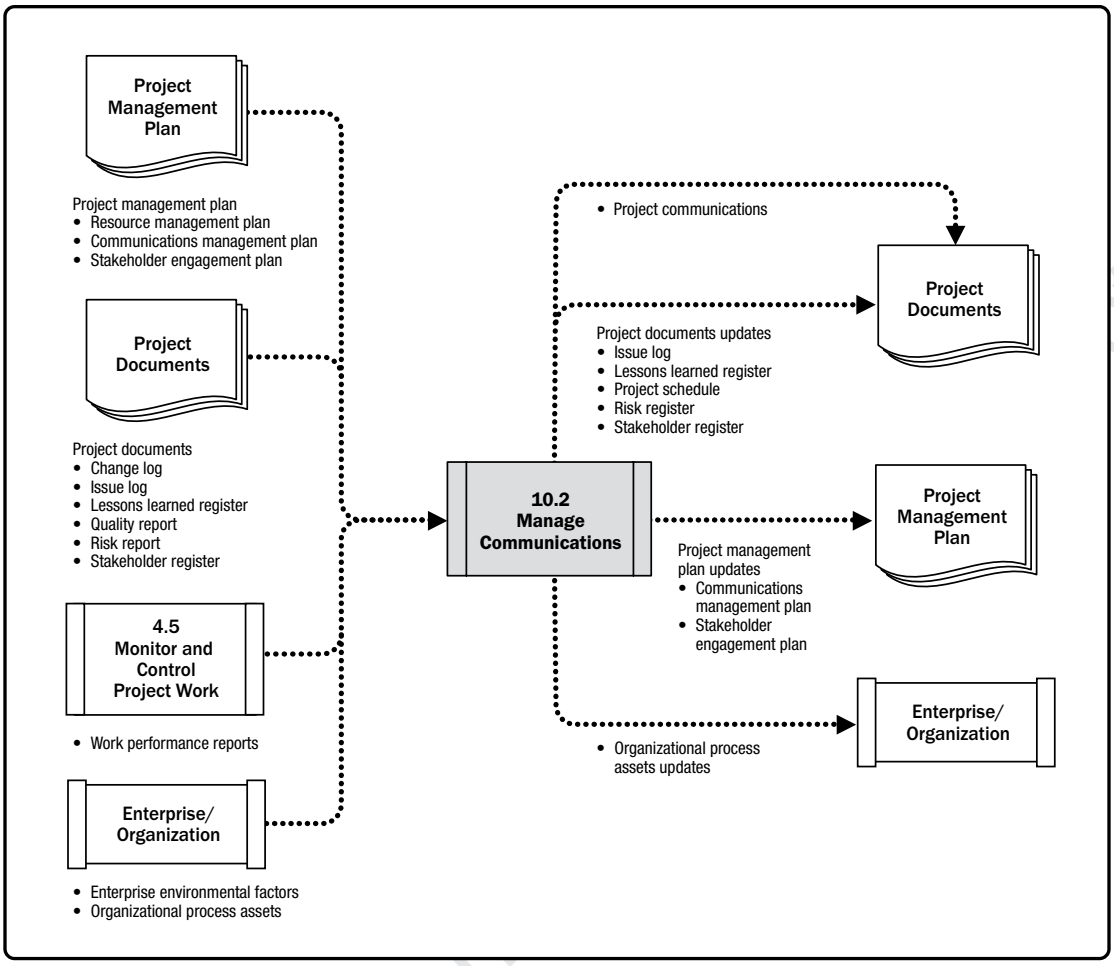

Figure 10-6. Manage Communications: Data Flow Diagram

This process goes beyond the distribution of relevant information and seeks to ensure that the information being communicated to project stakeholders has been appropriately generated and formatted, and received by the intended audience. It also provides opportunities for stakeholders to make requests for further information, clarification, and discussion. Techniques and considerations for effective communications management include but are not limited to:

- **Sender-receiver models.** Incorporating feedback loops to provide opportunities for interaction/participation and remove barriers to effective communication.
- **Choice of media.** Decisions about application of communications artifacts to meet specific project needs, such as when to communicate in writing versus orally, when to prepare an informal memo versus a formal report, and when to use push/pull options and the choice of appropriate technology.
- **Writing style.** Appropriate use of active versus passive voice, sentence structure, and word choice.
- **Meeting management.** Described in Section 10.2.2.6. Preparing an agenda, inviting essential participants, and ensuring they attend. Dealing with conflicts within the meeting or resulting from inadequate follow-up of minutes and actions, or attendance of the wrong people.
- **Presentations.** Awareness of the impact of body language and design of visual aids.
- **Facilitation.** Described in Section 4.1.2.3. Building consensus and overcoming obstacles such as difficult group dynamics, and maintaining interest and enthusiasm among group members.
- **Active listening.** Described in Section 10.2.2.6. Listening actively involves acknowledging, clarifying and confirming, understanding, and removing barriers that adversely affect comprehension.

10.2.1 MANAGE COMMUNICATIONS: INPUTS

10.2.1.1 PROJECT MANAGEMENT PLAN

Described in Section 4.2.3.1. Project management plan components include but are not limited to:

- **Resource management plan.** Described in Section 9.1.3.1. The resource management plan describes the communications that are needed for management of team or physical resources.
- **Communications management plan.** Described in Section 10.1.3.1. The communications management plan describes how project communications will be planned, structured, monitored, and controlled.
- **Stakeholder engagement plan.** Described in detail in Section 13.2.3.1. The stakeholder engagement plan describes how stakeholders will be engaged through appropriate communication strategies.

10.2.1.2 PROJECT DOCUMENTS

Project documents that can be considered as inputs for this process include but are not limited to

- **Change log.** Described in Section 4.6.3.3. The change log is used to communicate changes and approved, deferred, and rejected change requests to the impacted stakeholders.
- **Issue log.** Described in Section 4.6.3.3. Information about issues is communicated to impacted stakeholders.
- **Lessons learned register.** Described in Section 4.4.3.1. Lessons learned earlier in the project with regard to managing communications can be applied to later phases in the project to improve the efficiency and effectiveness of communications and the communication process.
- **Quality report.** Described in Section 8.2.3.1. Information in the quality report includes quality issues, project and product improvements, and process improvements. This information is forwarded to those who can take corrective actions in order to achieve the project quality expectations.
- **Risk report.** Described in Section 11.2.3.2. The risk report presents information on sources of overall project risk, together with summary information on identified individual project risks. This information is communicated to risk owners and other impacted stakeholders.
- **Stakeholder register.** Described in Section 13.1.3.1. The stakeholder register identifies the individuals, groups, or organizations that will need various types of information.

10.2.1.3 WORK PERFORMANCE REPORTS

Described in Section 4.5.3.1. Work performance reports are circulated to the project stakeholders through this process as defined in the communications management plan. Examples of work performance reports include status reports and progress reports. Work performance reports can contain earned value graphs and information, trend lines and forecasts, reserve burndown charts, defect histograms, contract performance information, and risk summaries. They can be presented as dashboards, heat reports, stop light charts, or other representations useful for creating awareness and generating decisions and actions.

10.2.1.4 ENTERPRISE ENVIRONMENTAL FACTORS

The enterprise environmental factors that can influence this process include but are not limited to:

- Organizational culture, political climate, and governance framework;
- Personnel administration policies;
- Stakeholder risk thresholds;
- Established communication channels, tools, and systems;
- Global, regional, or local trends and practices or habits; and
- Geographic distribution of facilities and resources.

10.2.1.5 ORGANIZATIONAL PROCESS ASSETS

The organizational process assets that can influence this process include but are not limited to:

- Corporate policies and procedures for social media, ethics, and security;
- Corporate policies and procedures for issue, risk, change, and data management;
- Organizational communication requirements;
- Standardized guidelines for development, exchange, storage, and retrieval of information; and
- Historical information from previous projects, including the lessons learned repository.

10.2.2 MANAGE COMMUNICATIONS: TOOLS AND TECHNIQUES

10.2.2.1 COMMUNICATION TECHNOLOGY

Described in Section 10.1.2.3. Factors that influence the technology include whether the team is colocated, the confidentiality of any information that needs to be shared, resources available to the team members, and how the organization's culture influences the way in which meetings and discussions are normally conducted.

10.2.2.2 COMMUNICATION METHODS

Described in Section 10.1.2.5. The choice of communication methods should allow flexibility in the event that the membership of the stakeholder community changes or their needs and expectations change.

10.2.2.3 COMMUNICATION SKILLS

Communication techniques that can be used for this process include but are not limited to:

- **Communication competence.** A combination of tailored communication skills that considers factors such as clarity of purpose in key messages, effective relationships and information sharing, and leadership behaviors.
- **Feedback.** Feedback is information about reactions to communications, a deliverable, or a situation. Feedback supports interactive communication between the project manager, team and all other project stakeholders. Examples include coaching, mentoring, and negotiating.
- **Nonverbal.** Examples of nonverbal communication include appropriate body language to transmit meaning through gestures, tone of voice, and facial expressions. Mirroring and eye contact are also important techniques. The team members should be aware of how they are expressing themselves both through what they say and what they don't say.
- **Presentations.** A presentation is the formal delivery of information and/or documentation. Clear and effective presentations of project information to relevant stakeholders can include but are not limited to:
  - Progress reports and information updates to stakeholders;
  - Background information to support decision making;
  - General information about the project and its objectives, for the purposes of raising the profile of the work of the project and the team; and
  - Specific information aimed at increasing understanding and support of the work and objectives of the project.

  Presentations will be successful when the content and delivery take the following into account:

  - The audience, their expectations, and needs; and
  - The needs and objectives of the project and project team.

10.2.2.4 PROJECT MANAGEMENT INFORMATION SYSTEM (PMIS)

Described in Section 4.3.2.2. Project management information systems can ensure that stakeholders can easily retrieve the information they need in a timely way. Project information is managed and distributed using a variety of tools, including:

- **Electronic project management tools.** Project management software, meeting and virtual office support software, web interfaces, specialized project portals and dashboards, and collaborative work management tools.
- **Electronic communications management.** Email, fax, and voice mail; audio, video and web conferencing; and websites and web publishing.
- **Social media management.** Websites and web publishing; and blogs and applications, which offer the opportunity to engage with stakeholders and form online communities.

10.2.2.5 PROJECT REPORTING

Project reporting is the act of collecting and distributing project information. Project information is distributed to many groups of stakeholders and should be adapted to provide information at an appropriate level, format, and detail for each type of stakeholder. The format may range from a simple communication to more elaborate custom reports and presentations. Information may be prepared regularly or on an exception basis. While work performance reports are the output of the Monitor and Control Project Work process, this process develops ad hoc reports, project presentations, blogs, and other types of communication about the project.

10.2.2.6 INTERPERSONAL AND TEAM SKILLS

Interpersonal and team skills that can be used for this process include but are not limited to:

- **Active listening.** Techniques of active listening involve acknowledging, clarifying and confirming, understanding, and removing barriers that adversely affect comprehension.
- **Conflict management.** Described in Section 9.5.2.1.
- **Cultural awareness.** Described in Section 10.1.2.6.
- **Meeting management.** Meeting management is taking steps to ensure meetings meet their intended objectives effectively and efficiently. The following steps should be used for meeting planning:
  - Prepare and distribute the agenda stating the objectives of the meeting.
  - Ensure that the meetings start and finish at the published time.
  - Ensure the appropriate participants are invited and attend.
  - Stay on topic.
  - Manage expectations, issues, and conflicts during the meeting.
  - Record all actions and those who have been allocated the responsibility for completing the action.
- **Networking.** Networking is interacting with others to exchange information and develop contacts. Networks provide project managers and their teams with access to informal organizations to solve problems, influence actions of their stakeholders, and increase stakeholder support for the work and outcomes of the project, thus improving performance.
- **Political awareness.** Described in Section 10.1.2.6. Political awareness assists the project manager in engaging stakeholders appropriately to maintain their support throughout the project.

10.2.2.7 MEETINGS

Meetings support the actions defined in the communication strategy and communications plan.

10.2.3 MANAGE COMMUNICATIONS: OUTPUTS

10.2.3.1 PROJECT COMMUNICATIONS

Project communications artifacts may include but are not limited to: performance reports, deliverable status, schedule progress, cost incurred, presentations, and other information required by stakeholders.

10.2.3.2 PROJECT MANAGEMENT PLAN UPDATES

Any change to the project management plan goes through the organization's change control process via a change request. Components of the project management plan that may be updated as a result of carrying out this process include but are not limited to:

- **Communications management plan.** Described in Section 10.1.3.1. When changes are made to the project communications approach as a result of this process, these changes are reflected in the project communications plan.
- **Stakeholder engagement plan.** Described in Section 13.2.3.1. Stakeholder communication requirements and agreed-upon communications strategies are updated as a result of this process.

10.2.3.3 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of carrying out this process include but are not limited to:

- **Issue log.** Described in Sections 4.3.3.3. The issue log is updated to reflect any communication issues on the project, or how any communications have been used to impact active issues.
- **Lessons learned register.** Described in Section 4.3.3.1. The lessons learned register is updated with information on challenges encountered and how they could have been avoided as well as approaches that worked well and what did not work well for managing communications.
- **Project schedule.** Described in Section 6.5.3.2. The project schedule may be updated to reflect the status of communication activities.
- **Risk register.** Described in Section 11.2.3.1. The risk register is updated to capture risks associated with managing communications.
- **Stakeholder register.** Described in Section 13.1.3.1. The stakeholder register can be updated to include information regarding communications activities with project stakeholders.

10.2.3.4 ORGANIZATIONAL PROCESS ASSETS UPDATES

Organizational process assets that may be updated as a result of this process include but are not limited to:

- Project records such as correspondence, memos, meeting minutes and other documents used on the project; and
- Planned and ad hoc project reports and presentations.

10.3 MONITOR COMMUNICATIONS

Monitor Communications is the process of ensuring the information needs of the project and its stakeholders are met. The key benefit of this process is the optimal information flow as defined in the communications management plan and the stakeholder engagement plan. This process is performed throughout the project. The inputs, tools and techniques, and outputs of the process are depicted in Figure 10-7. Figure 10-8 depicts the data flow diagram for the process.

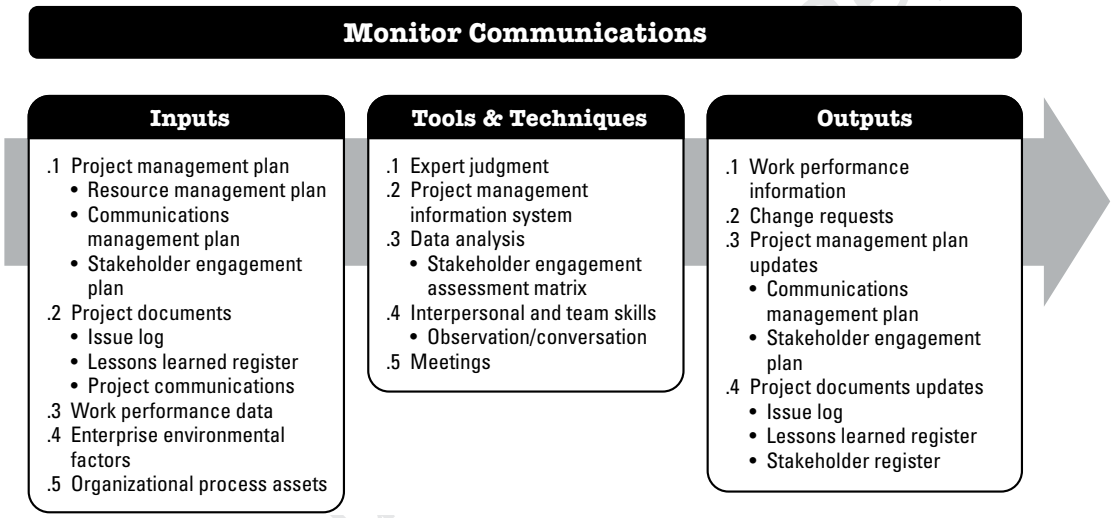

Figure 10-7. Monitor Communications: Inputs, Tools & Techniques, and Outputs

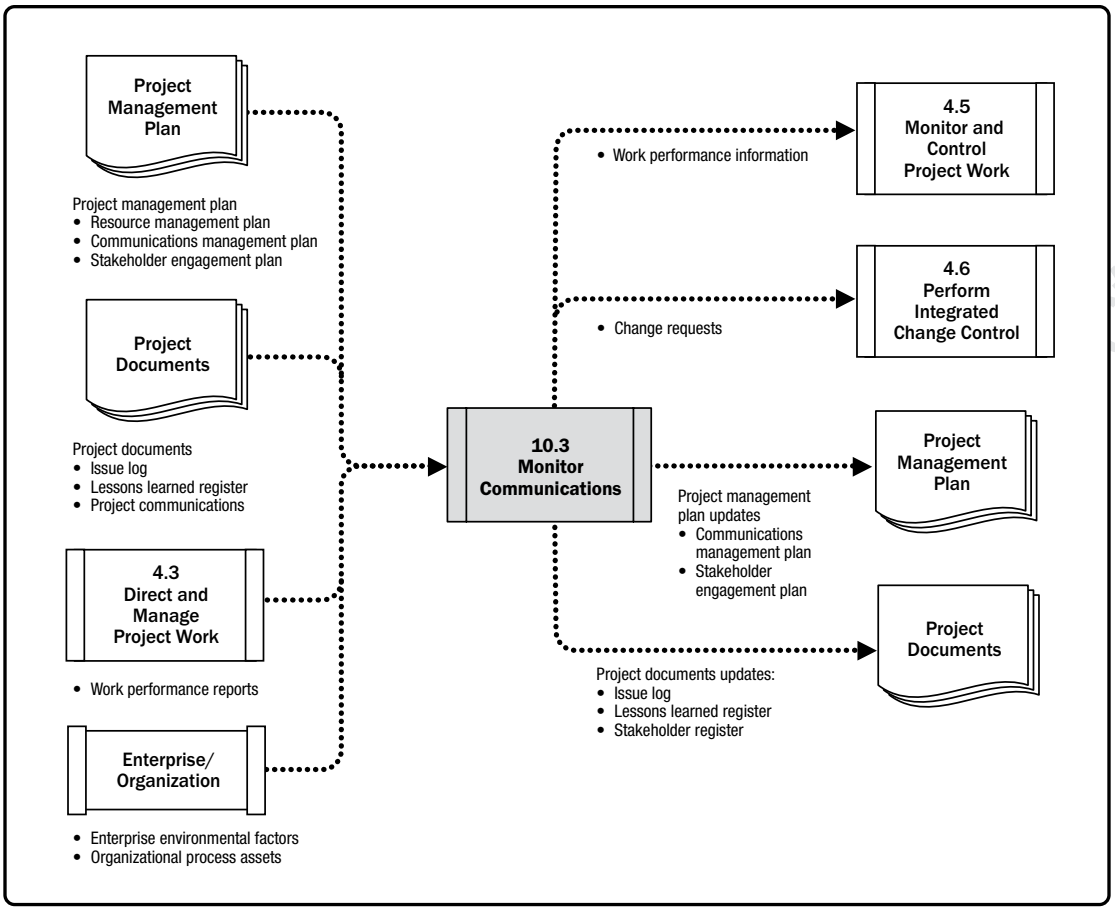

Figure 10-8. Monitor Communications: Data Flow Diagram

Monitor Communications determines if the planned communications artifacts and activities have had the desired effect of increasing or maintaining stakeholders' support for the project's deliverables and expected outcomes. The impact and consequences of project communications should be carefully evaluated and monitored to ensure that the right message with the right content (the same meaning for sender and receiver) is delivered to the right audience, through the right channel, and at the right time. Monitor Communications may require a variety of methods, such as customer satisfaction surveys, collecting lessons learned, observations of the team, reviewing data from the issue log, or evaluating changes in the stakeholder engagement assessment matrix described in Section 13.2.2.5.

The Monitor Communications process can trigger an iteration of the Plan Communications Management and/or Manage Communications processes to improve effectiveness of communication through additional and possibly amended communications plans and activities. Such iterations illustrate the continuous nature of the Project Communications Management processes. Issues or key performance indicators, risks, or conflicts may trigger an immediate revision.

10.3.1 MONITOR COMMUNICATIONS: INPUTS

10.3.1.1 PROJECT MANAGEMENT PLAN

Described in Section 4.2.3.1. Project management plan components include but are not limited to:

- **Resource management plan.** Described in Section 9.1.3.1. The resource management plan can be used to understand the actual project organization and any changes through understanding of roles and responsibilities and the project organization charts.
- **Communications management plan.** Described in Section 10.1.3.1. The communications management plan contains the current plan for collecting, creating, and distributing information in a timely manner. It identifies the team members, stakeholders, and the work involved in the communication process.
- **Stakeholder engagement plan.** Described in Section 13.2.3.1. The stakeholder engagement plan identifies the communication strategies that are planned to engage stakeholders.

10.3.1.2 PROJECT DOCUMENTS

Project documents that can be considered as inputs for this process include but are not limited to:

- **Issue log.** Described in Section 4.3.3.3. The issue log provides the project's history, a record of stakeholder engagement issues, and how they were resolved.
- **Lessons learned register.** Described in Section 4.4.3.1. Lessons learned earlier in the project can be applied to later phases in the project to improve communication effectiveness.
- **Project communications.** Described in Section 10.2.3.1. Provides information about communications that have been distributed.

10.3.1.3 WORK PERFORMANCE DATA

Described in Section 4.3.3.2. Work performance data contains data on the types and quantities of communications that have actually been distributed.

10.3.1.4 ENTERPRISE ENVIRONMENTAL FACTORS

The enterprise environmental factors that can influence the Monitor Communications process include but are not limited to:

- Organizational culture, political climate, and governance framework;
- Established communication channels, tools, and systems;
- Global, regional, or local trends, practices, or habits; and
- Geographic distribution of facilities and resources.

10.3.1.5 ORGANIZATIONAL PROCESS ASSETS

The organizational process assets that may influence the Monitor Communications process include but are not limited to:

- Corporate policies and procedures for social media, ethics, and security;
- Organizational communication requirements;
- Standardized guidelines for development, exchange, storage, and retrieval of information;
- Historical information and lessons learned repository from previous projects; and
- Stakeholder and communications data and information from previous projects.

10.3.2 MONITOR COMMUNICATIONS: TOOLS AND TECHNIQUES

10.3.2.1 EXPERT JUDGMENT

Described in Section 4.1.2.1. Expertise should be considered from individuals or groups with specialized knowledge or training in the following topics:

- Communications with the public, the community, and the media, and, in an international environment, between virtual groups; and
- Communications and project management systems.

10.3.2.2 PROJECT MANAGEMENT INFORMATION SYSTEM (PMIS)

Described in Section 4.3.2.2. Project management information systems provides a set of standard tools for the project manager to capture, store, and distribute information to internal and external stakeholders with the information they need according the communications plan. The information contained in the system is monitored to assess its validity and effectiveness.

10.3.2.3 DATA REPRESENTATION

A data representation technique that can be used includes but is not limited to the stakeholder engagement assessment matrix (Section 13.2.2.5), which can provide information about the effectiveness of the communications activities. This is achieved by reviewing changes between desired and current engagement and adjusting communications as necessary.

10.3.2.4 INTERPERSONAL AND TEAM SKILLS

Interpersonal and team skills that can be used for this process include but are not limited to observation/conversation as described in Section 5.2.2.6. Discussion and dialogue with the project team helps determine the most appropriate way to update and communicate project performance, and to respond to requests from stakeholders for information. Observation and conversation enables the project manager to identify issues within the team, conflicts between people, or individual performance issues.

10.3.2.5 MEETINGS

Face-to-face or virtual meetings are used for decision making; responding to stakeholder requests; and having discussions with suppliers, vendors, and other project stakeholders.

10.3.3 MONITOR COMMUNICATIONS: OUTPUTS

10.3.3.1 WORK PERFORMANCE INFORMATION

Described in Section 4.5.1.3. Work performance information includes information on how project communication is performing by comparing the communications that were implemented compared to those that were planned. It also considers feedback on communications, such as survey results on communication effectiveness.

10.3.3.2 CHANGE REQUESTS

Described in Section 4.3.3.4. The Monitor Communications process often results in the need for adjustment, action, and intervention on communications activities defined in the communications management plan. Change requests are processed through the Perform Integrated Change Control process (Section 4.6).

These change requests may result in:

- Revision of stakeholder communication requirements, including stakeholders' information distribution, content or format, and distribution method; and
- New procedures to eliminate bottlenecks.

10.3.3.3 PROJECT MANAGEMENT PLAN UPDATES

Any change to the project management plan goes through the organization's change control process via a change request. Components that may require a change request for the project management plan include but are not limited to:

- **Communications management plan.** Described in Section 10.1.3.1. The communications management plan is updated with new information to make communication more effective.
- **Stakeholder engagement plan.** Described in Section 13.2.3.1. The stakeholder engagement plan is updated to reflect the actual situation of stakeholders, their communication needs, and their importance.

10.3.3.4 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of carrying out this process include but are not limited to:

- **Issue log.** Described in Section 4.3.3.3. The issue log may be updated with new information on issues raised, their progress, and resolution.
- **Lessons learned register.** Described in Section 4.4.3.1. The lessons learned register may be updated with causes of issues, reasons behind the corrective actions chosen, and other communication lessons learned as appropriate.
- **Stakeholder register.** Described in Section 13.1.3.1. The stakeholder register may be updated with revised stakeholder communication requirements.

11

PROJECT RISK MANAGEMENT

Project Risk Management includes the processes of conducting risk management planning, identification, analysis, response planning, response implementation, and monitoring risk on a project. The objectives of project risk management are to increase the probability and/or impact of positive risks and to decrease the probability and/or impact of negative risks, in order to optimize the chances of project success.

The Project Risk Management processes are:

11.1 Plan Risk Management—The process of defining how to conduct risk management activities for a project.

11.2 Identify Risks—The process of identifying individual project risks as well as sources of overall project risk, and documenting their characteristics.

11.3 Perform Qualitative Risk Analysis—The process of prioritizing individual project risks for further analysis or action by assessing their probability of occurrence and impact as well as other characteristics.

11.4 Perform Quantitative Risk Analysis—The process of numerically analyzing the combined effect of identified individual project risks and other sources of uncertainty on overall project objectives.

11.5 Plan Risk Responses—The process of developing options, selecting strategies, and agreeing on actions to address overall project risk exposure, as well as to treat individual project risks.

11.6 Implement Risk Responses—The process of implementing agreed-upon risk response plans.

11.7 Monitor Risks—The process of monitoring the implementation of agreed-upon risk response plans, tracking identified risks, identifying and analyzing new risks, and evaluating risk process effectiveness throughout the project.

Figure 11-1 provides an overview of the Project Risk Management processes. The Project Management Risk processes are presented as discrete processes with defined interfaces while, in practice, they overlap and interact in ways that cannot be completely detailed in this *PMBOK® Guide*.

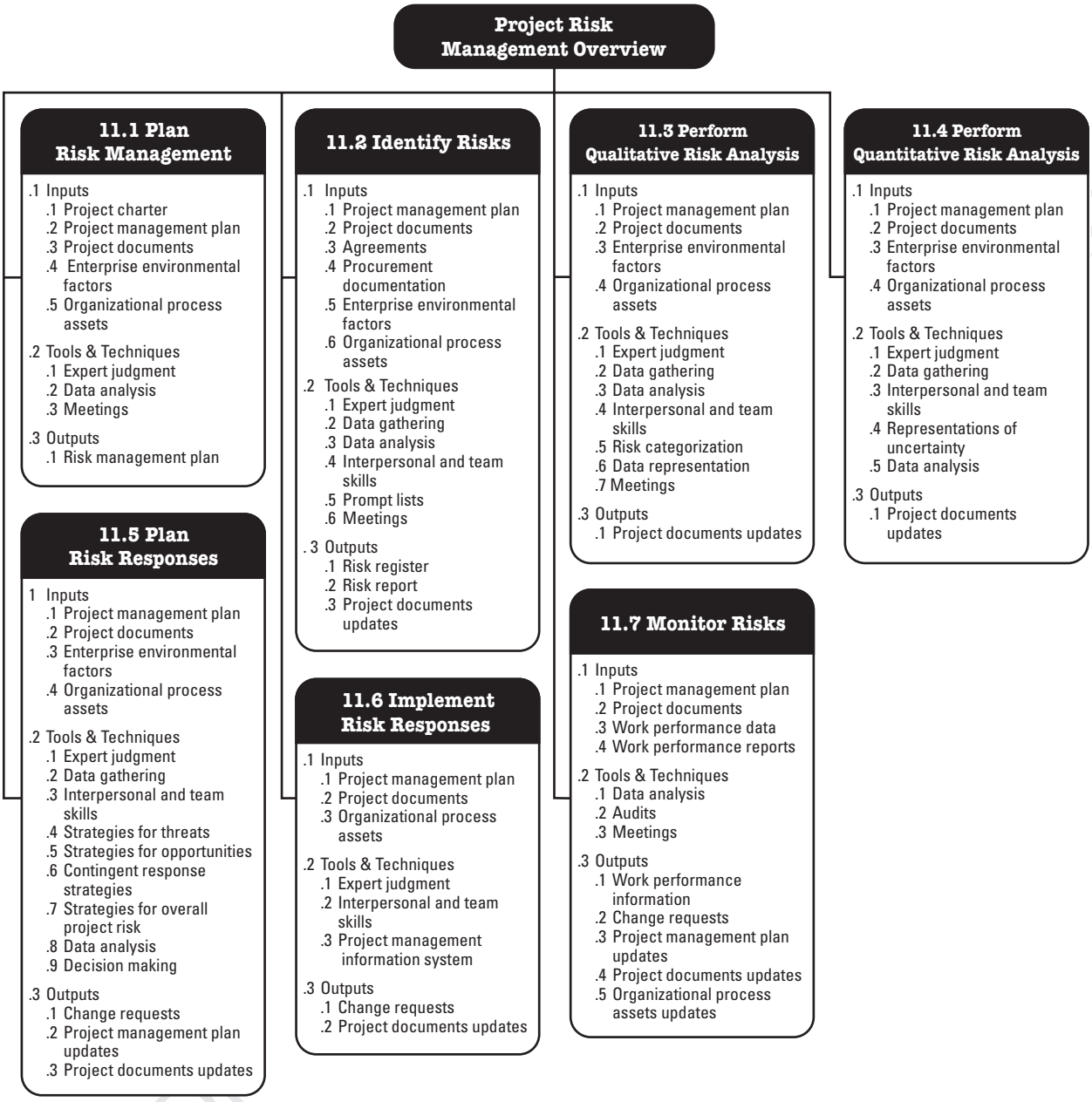

Figure 11-1. Project Risk Management Overview

KEY CONCEPTS FOR PROJECT RISK MANAGEMENT

All projects are risky since they are unique undertakings with varying degrees of complexity that aim to deliver benefits. They do this in a context of constraints and assumptions, while responding to stakeholder expectations that may be conflicting and changing. Organizations should choose to take project risk in a controlled and intentional manner in order to create value while balancing risk and reward.

Project Risk Management aims to identify and manage risks that are not addressed by the other project management processes. When unmanaged, these risks have the potential to cause the project to deviate from the plan and fail to achieve the defined project objectives. Consequently, the effectiveness of Project Risk Management is directly related to project success.

Risk exists at two levels within every project. Each project contains individual risks that can affect the achievement of project objectives. It is also important to consider the riskiness of the overall project, which arises from the combination of individual project risks and other sources of uncertainty. Project Risk Management processes address both levels of risk in projects, and these are defined as follows:

- **Individual project risk** is an uncertain event or condition that, if it occurs, has a positive or negative effect on one or more project objectives.
- **Overall project risk** is the effect of uncertainty on the project as a whole, arising from all sources of uncertainty including individual risks, representing the exposure of stakeholders to the implications of variations in project outcome, both positive and negative.

Individual project risks can have a positive or negative effect on project objectives if they occur. Project Risk Management aims to exploit or enhance positive risks (opportunities) while avoiding or mitigating negative risks (threats). Unmanaged threats may result in issues or problems such as delay, cost overruns, performance shortfall, or loss of reputation. Opportunities that are captured can lead to benefits such as reduced time and cost, improved performance, or reputation.

Overall project risk can also be positive or negative. Management of overall project risk aims to keep project risk exposure within an acceptable range by reducing drivers of negative variation, promoting drivers of positive variation, and maximizing the probability of achieving overall project objectives.

Risks will continue to emerge during the lifetime of the project, so Project Risk Management processes should be conducted iteratively. Risk is initially addressed during project planning by shaping the project strategy. Risk should also be monitored and managed as the project progresses to ensure that the project stays on track and emergent risks are addressed.

In order to manage risk effectively on a particular project, the project team needs to know what level of risk exposure is acceptable in pursuit of the project objectives. This is defined by measurable risk thresholds that reflect the risk appetite of the organization and project stakeholders. Risk thresholds express the degree of acceptable variation around a project objective. They are explicitly stated and communicated to the project team and reflected in the definitions of risk impact levels for the project.

TRENDS AND EMERGING PRACTICES IN PROJECT RISK MANAGEMENT

The focus of project risk management is broadening to ensure that all types of risk are considered, and that project risks are understood in a wider context. Trends and emerging practices for Project Risk Management include but are not limited to:

- **Non-event risks.** Most projects focus only on risks that are uncertain future events that may or may not occur. Examples of event-based risks include: a key seller may go out of business during the project, the customer may change the requirement after design is complete, or a subcontractor may propose enhancements to the standard operating processes.

  There is an increasing recognition that non-event risks need to be identified and managed. There are two main types of non-event risks:

  - *Variability risk.* Uncertainty exists about some key characteristics of a planned event or activity or decision. Examples of variability risks include: productivity may be above or below target, the number of errors found during testing may be higher or lower than expected, or unseasonal weather conditions may occur during the construction phase.
  - *Ambiguity risk.* Uncertainty exists about what might happen in the future. Areas of the project where imperfect knowledge might affect the project's ability to achieve its objectives include: elements of the requirement or technical solution, future developments in regulatory frameworks, or inherent systemic complexity in the project.

Variability risks can be addressed using Monte Carlo analysis, with the range of variation reflected in probability distributions, followed by actions to reduce the spread of possible outcomes. Ambiguity risks are managed by defining those areas where there is a deficit of knowledge or understanding, then filling the gap by obtaining expert external input or benchmarking against best practices. Ambiguity is also addressed through incremental development, prototyping, or simulation.

- **Project resilience.** The existence of emergent risk is becoming clear, with a growing awareness of so-called unknowable-unknowns. These are risks that can only be recognized after they have occurred. Emergent risks can be tackled through developing project resilience. This requires each project to have:
  - Right level of budget and schedule contingency for emergent risks, in addition to a specific risk budget for known risks;
  - Flexible project processes that can cope with emergent risk while maintaining overall direction toward project goals, including strong change management;
  - Empowered project team that has clear objectives and that is trusted to get the job done within agreed-upon limits;
  - Frequent review of early warning signs to identify emergent risks as early as possible; and
  - Clear input from stakeholders to clarify areas where the project scope or strategy can be adjusted in response to emergent risks.
- **Integrated risk management.** Projects exist in an organizational context, and they may form part of a program or portfolio. Risk exists at each of these levels, and risks should be owned and managed at the appropriate level. Some risks identified at higher levels will be delegated to the project team for management, and some project risks may be escalated to higher levels if they are best managed outside the project. A coordinated approach to enterprise-wide risk management ensures alignment and coherence in the way risk is managed across all levels. This builds risk efficiency into the structure of programs and portfolios, providing the greatest overall value for a given level of risk exposure.

TAILORING CONSIDERATIONS

Because each project is unique, it is necessary to tailor the way Project Risk Management processes are applied. Considerations for tailoring include but are not limited to:

- **Project size.** Does the project's size in terms of budget, duration, scope, or team size require a more detailed approach to risk management? Or is it small enough to justify a simplified risk process?
- **Project complexity.** Is a robust risk approach demanded by high levels of innovation, new technology, commercial arrangements, interfaces, or external dependencies that increase project complexity? Or is the project simple enough that a reduced risk process will suffice?
- **Project importance.** How strategically important is the project? Is the level of risk increased for this project because it aims to produce breakthrough opportunities, addresses significant blocks to organizational performance, or involves major product innovation?
- **Development approach.** Is this a waterfall project, where risk processes can be followed sequentially and iteratively, or does the project follow an agile approach where risk is addressed at the start of each iteration as well as during its execution?

Tailoring of the Project Risk Management processes to meet these considerations is part of the Plan Risk Management process, and the outcomes of tailoring decisions are recorded in the risk management plan.

CONSIDERATIONS FOR AGILE/ADAPTIVE ENVIRONMENTS

High-variability environments, by definition, incur more uncertainty and risk. To address this, projects managed using adaptive approaches make use of frequent reviews of incremental work products and cross-functional project teams to accelerate knowledge sharing and ensure that risk is understood and managed. Risk is considered when selecting the content of each iteration, and risks will also be identified, analyzed, and managed during each iteration.

Additionally, the requirements are kept as a living document that is updated regularly, and work may be reprioritized as the project progresses, based on an improved understanding of current risk exposure.

11.1 PLAN RISK MANAGEMENT

Plan Risk Management is the process of defining how to conduct risk management activities for a project. The key benefit of this process is that it ensures that the degree, type, and visibility of risk management are proportionate to both risks and the importance of the project to the organization and other stakeholders. This process is performed once or at predefined points in the project. The inputs, tools and techniques, and outputs of the process are depicted in Figure 11-2. Figure 11-3 depicts the data flow diagram for the process.

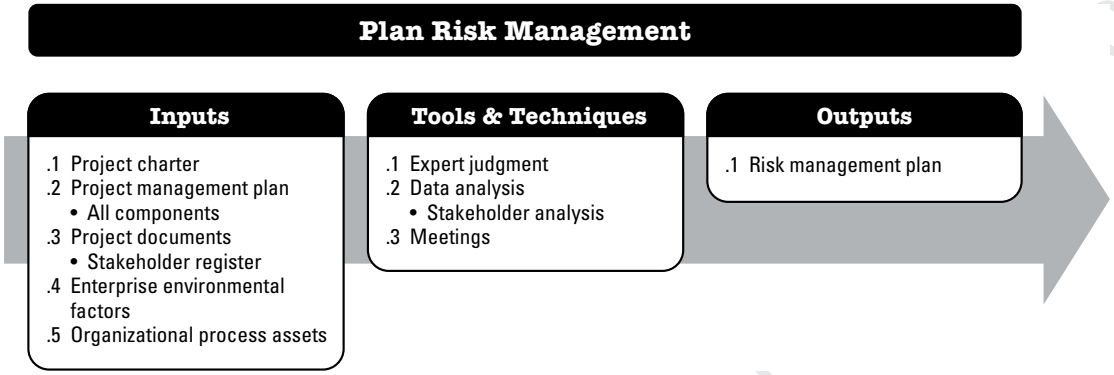

Figure 11-2. Plan Risk Management: Inputs, Tools & Techniques, and Outputs

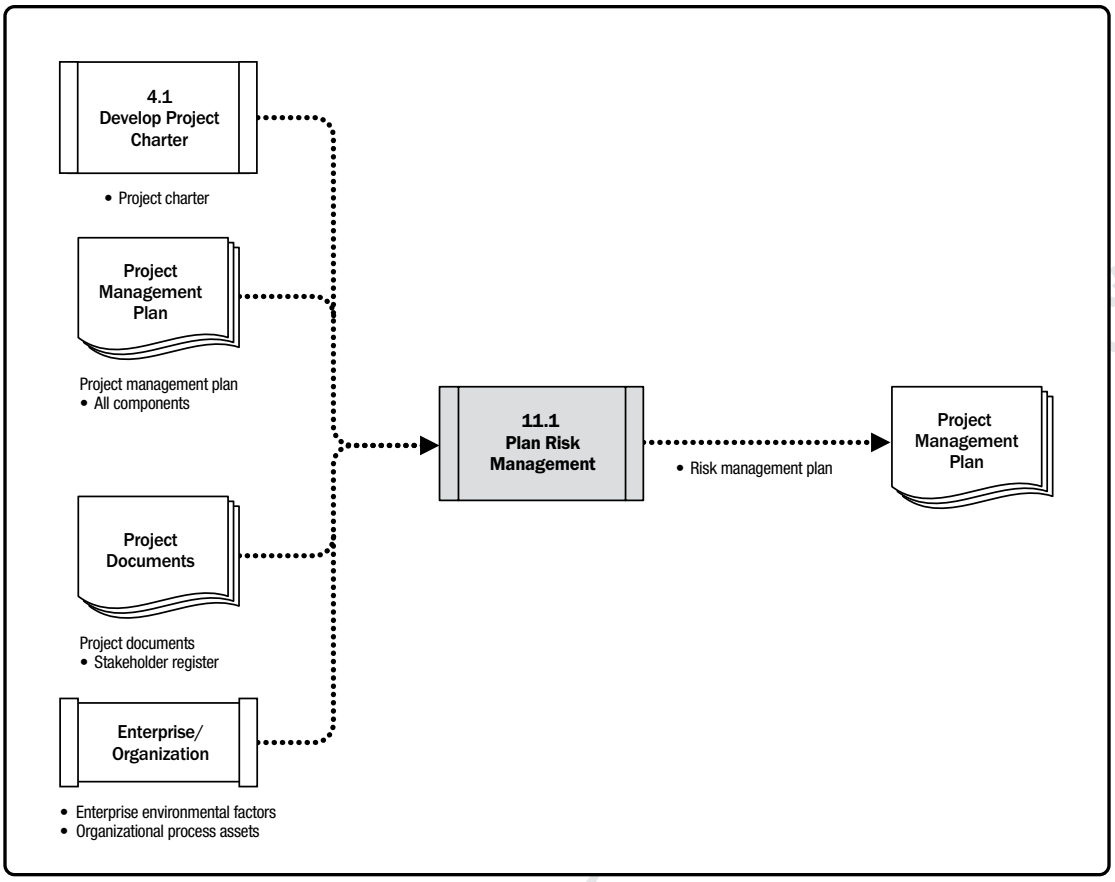

Figure 11-3. Plan Risk Management: Data Flow Diagram

The Plan Risk Management process should begin when a project is conceived and should be completed early in the project. It may be necessary to revisit this process later in the project life cycle, for example at a major phase change, or if the project scope changes significantly, or if a subsequent review of risk management effectiveness determines that the Project Risk Management process requires modification.

11.1.1 PLAN RISK MANAGEMENT: INPUTS

11.1.1.1 PROJECT CHARTER

Described in Section 4.1.3.1. The project charter documents the high-level project description and boundaries, high-level requirements, and risks.

11.1.1.2 PROJECT MANAGEMENT PLAN

Described in Section 4.2.3.1. In planning Project Risk Management, all approved subsidiary management plans should be taken into consideration in order to make the risk management plan consistent with them. The methodology outlined in other project management plan components might influence the Plan Risk Management process.

11.1.1.3 PROJECT DOCUMENTS

Project documents that can be considered as inputs for this process include but are not limited to the stakeholder register as described in Section 13.1.3.1. The stakeholder register contains details of the project's stakeholders and provides an overview of their project roles and their attitude toward risk on this project. This is useful in determining roles and responsibilities for managing risk on the project, as well as setting risk thresholds for the project.

11.1.1.4 ENTERPRISE ENVIRONMENTAL FACTORS

The enterprise environmental factors that can influence the Plan Risk Management process include but are not limited to overall risk thresholds set by the organization or key stakeholders.

11.1.1.5 ORGANIZATIONAL PROCESS ASSETS

The organizational process assets that can influence the Plan Risk Management process include but are not limited to:

- Organizational risk policy;
- Risk categories, possibly organized into a risk breakdown structure;
- Common definitions of risk concepts and terms;
- Risk statement formats;
- Templates for the risk management plan, risk register, and risk report;
- Roles and responsibilities;
- Authority levels for decision making; and
- Lessons learned repository from previous similar projects.

11.1.2 PLAN RISK MANAGEMENT: TOOLS AND TECHNIQUES

11.1.2.1 EXPERT JUDGMENT

Described in Section 4.1.2.1. Expertise should be considered from individuals or groups with specialized knowledge or training in the following topics:

- Familiarity with the organization's approach to managing risk, including enterprise risk management where this is performed;
- Tailoring risk management to the specific needs of a project; and
- Types of risk that are likely to be encountered on projects in the same area.

11.1.2.2 DATA ANALYSIS

Data analysis techniques that can be used for this process includes but are not limited to a stakeholder analysis (Section 13.1.2.3) to determine the risk appetite of project stakeholders.

11.1.2.3 MEETINGS

The risk management plan may be developed as part of the project kick-off meeting or a specific planning meeting may be held. Attendees may include the project manager, selected project team members, key stakeholders, or team members who are responsible to manage the risk management process on the project. Others outside the organization may also be invited, as needed, including customers, sellers, and regulators. A skilled facilitator can help participants remain focused on the task, agree on key aspects of the risk approach, identify and overcome sources of bias, and resolve any disagreements that may arise.

Plans for conducting risk management activities are defined in these meetings and documented in the risk management plan (see Section 11.1.3.1).

11.1.3 PLAN RISK MANAGEMENT: OUTPUTS

11.1.3.1 RISK MANAGEMENT PLAN

The risk management plan is a component of the project management plan that describes how risk management activities will be structured and performed. The risk management plan may include some or all of the following elements:

- **Risk strategy.** Describes the general approach to managing risk on this project.
- **Methodology.** Defines the specific approaches, tools, and data sources that will be used to perform risk management on the project.
- **Roles and responsibilities.** Defines the lead, support, and risk management team members for each type of activity described in the risk management plan, and clarifies their responsibilities.
- **Funding.** Identifies the funds needed to perform activities related to Project Risk Management. Establishes protocols for the application of contingency and management reserves.
- **Timing.** Defines when and how often the Project Risk Management processes will be performed throughout the project life cycle, and establishes risk management activities for inclusion into the project schedule.
- **Risk categories.** Provide a means for grouping individual project risks. A common way to structure risk categories is with a risk breakdown structure (RBS), which is a hierarchical representation of potential sources of risk (see example in Figure 11-4). An RBS helps the project team consider the full range of sources from which individual project risks may arise. This can be useful when identifying risks or when categorizing identified risks. The organization may have a generic RBS to be used for all projects, or there may be several RBS frameworks for different types of projects, or the project may develop a tailored RBS. Where an RBS is not used, an organization may use a custom risk categorization framework, which may take the form of a simple list of categories or a structure based on project objectives.

RBS LEVEL 0	RBS LEVEL 1	RBS LEVEL 2
0. ALL SOURCES OF PROJECT RISK	1. TECHNICAL RISK	1.1 Scope definition
		1.2 Requirements definition
		1.3 Estimates, assumptions, and constraints
		1.4 Technical processes
		1.5 Technology
		1.6 Technical interfaces
		Etc.
	2. MANAGEMENT RISK	2.1 Project management
		2.2 Program/portfolio management
		2.3 Operations management
		2.4 Organization
		2.5 Resourcing
		2.6 Communication
		Etc.
	3. COMMERCIAL RISK	3.1 Contractual terms and conditions
		3.2 Internal procurement
		3.3 Suppliers and vendors
		3.4 Subcontracts
		3.5 Client/customer stability
		3.6 Partnerships and joint ventures
		Etc.
	4. EXTERNAL RISK	4.1 Legislation
		4.2 Exchange rates
		4.3 Site/facilities
		4.4 Environmental/weather
		4.5 Competition
		4.6 Regulatory
		Etc.

Figure 11-4. Extract from Sample Risk Breakdown Structure (RBS)

- **Stakeholder risk appetite.** The risk appetites of key stakeholders on the project are recorded in the risk management plan, as they inform the details of the Plan Risk Management process. In particular, stakeholder risk appetite should be expressed as measurable risk thresholds around each project objective. These thresholds will determine the acceptable level of overall project risk exposure, and they are also used to inform the definitions of probability and impacts to be used when assessing and prioritizing individual project risks.
- **Definitions of risk probability and impacts.** Definitions of risk probability and impact levels are specific to the project context and reflect the risk appetite and thresholds of the organization and key stakeholders. The project may generate specific definitions of probability and impact levels or it may start with general definitions provided by the organization. The number of levels reflects the degree of detail required for the Project Risk Management process, with more levels used for a more detailed risk approach (typically five levels), and fewer for a simple process (usually three). Table 11-1 provides an example of definitions of probability and impacts against three project objectives. These scales can be used to evaluate both threats and opportunities by interpreting the impact definitions as negative for threats (delay, additional cost, and performance shortfall) and positive for opportunities (reduced time or cost, and performance enhancement).

Table 11-1. Example of Definitions for Probability and Impacts

SCALE	PROBABILITY	+/− IMPACT ON PROJECT OBJECTIVES		
		TIME	COST	QUALITY
Very High	>70%	>6 months	>$5M	Very significant impact on overall functionality
High	51-70%	3-6 months	$1M-$5M	Significant impact on overall functionality
Medium	31-50%	1-3 months	$501K-$1M	Some impact in key functional areas
Low	11-30%	1-4 weeks	$100K-$500K	Minor impact on overall functionality
Very Low	1-10%	1 week	<$100K	Minor impact on secondary functions
Nil	<1%	No change	No change	No change in functionality

- **Probability and impact matrix.** Described in Section 11.3.2.6. Prioritization rules may be specified by the organization in advance of the project and be included in organizational process assets, or they may be tailored to the specific project. Opportunities and threats are represented in a common probability and impact matrix using positive definitions of impact for opportunities and negative impact definitions for threats. Descriptive terms (such as very high, high, medium, low, and very low) or numeric values can be used for probability and impact. Where numeric values are used, these can be multiplied to give a probability-impact score for each risk, which allows the relative priority of individual risks to be evaluated within each priority level. An example probability and impact matrix is presented in Figure 11-5, which also shows a possible numeric risk scoring scheme.

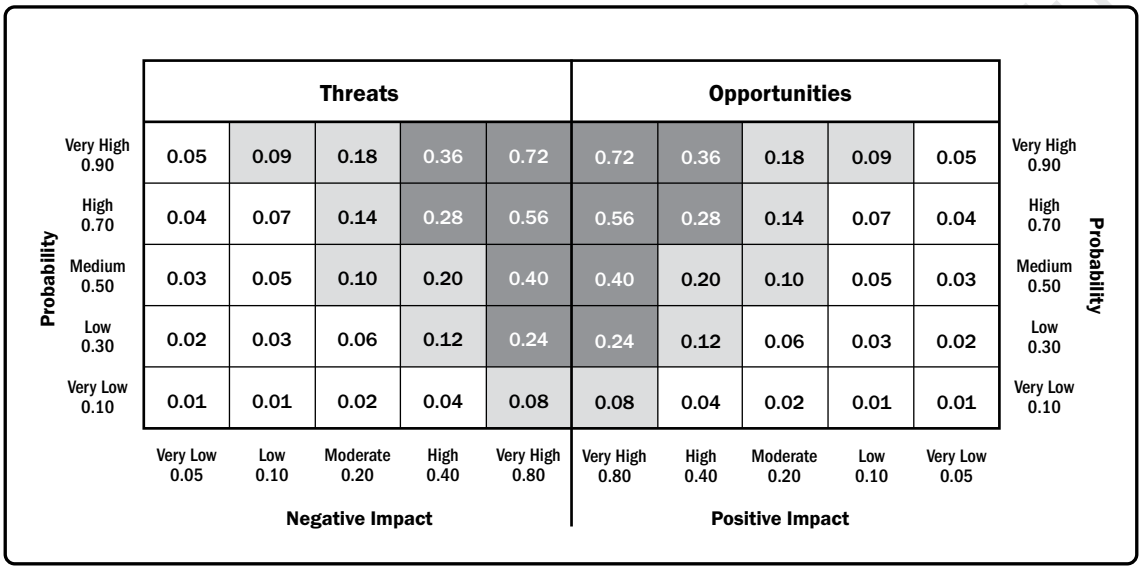

Figure 11-5. Example Probability and Impact Matrix with Scoring Scheme

- **Reporting formats.** Reporting formats define how the outcomes of the Project Risk Management process will be documented, analyzed, and communicated. This section of the risk management plan describes the content and format of the risk register and the risk report, as well as any other required outputs from the Project Risk Management processes.
- **Tracking.** Tracking documents how risk activities will be recorded and how risk management processes will be audited.

11.2 IDENTIFY RISKS

Identify Risks is the process of identifying individual project risks as well as sources of overall project risk, and documenting their characteristics. The key benefit of this process is the documentation of existing individual project risks and the sources of overall project risk. It also brings together information so the project team can respond appropriately to identified risks. This process is performed throughout the project. The inputs, tools and techniques, and outputs of the process are depicted in Figure 11-6. Figure 11-7 depicts the data flow diagram for the process.

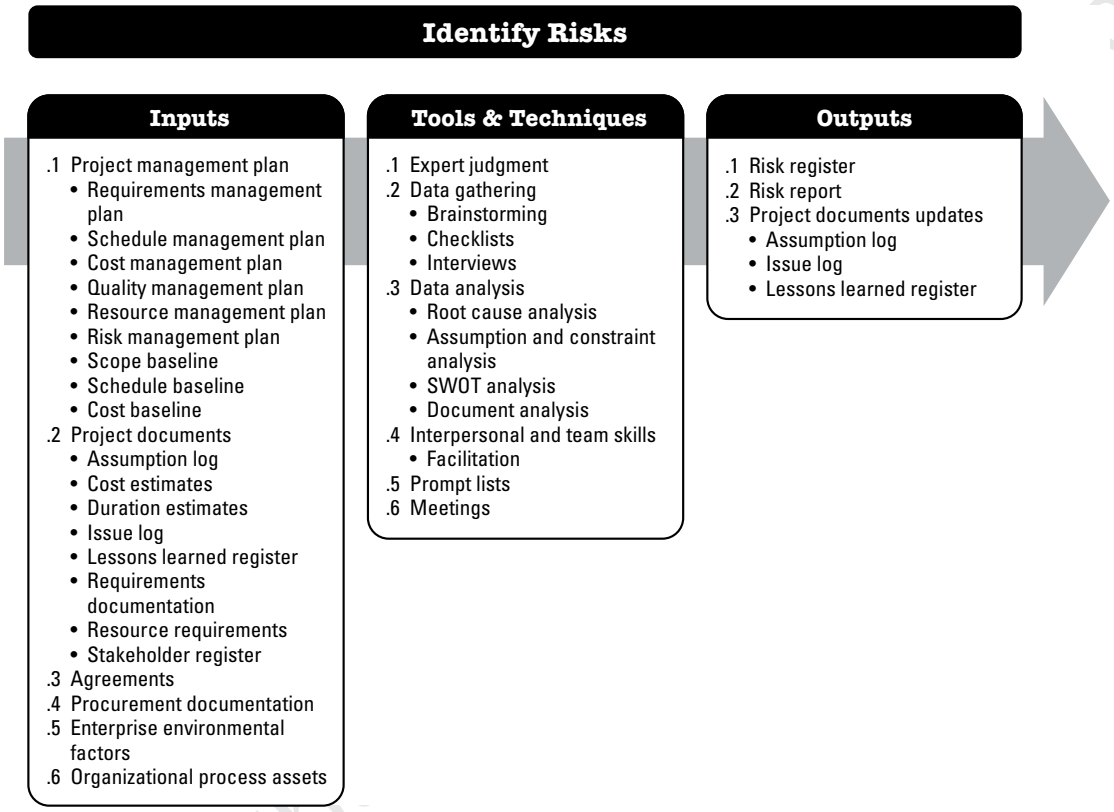

Figure 11-6. Identify Risks: Inputs, Tools & Techniques, and Outputs

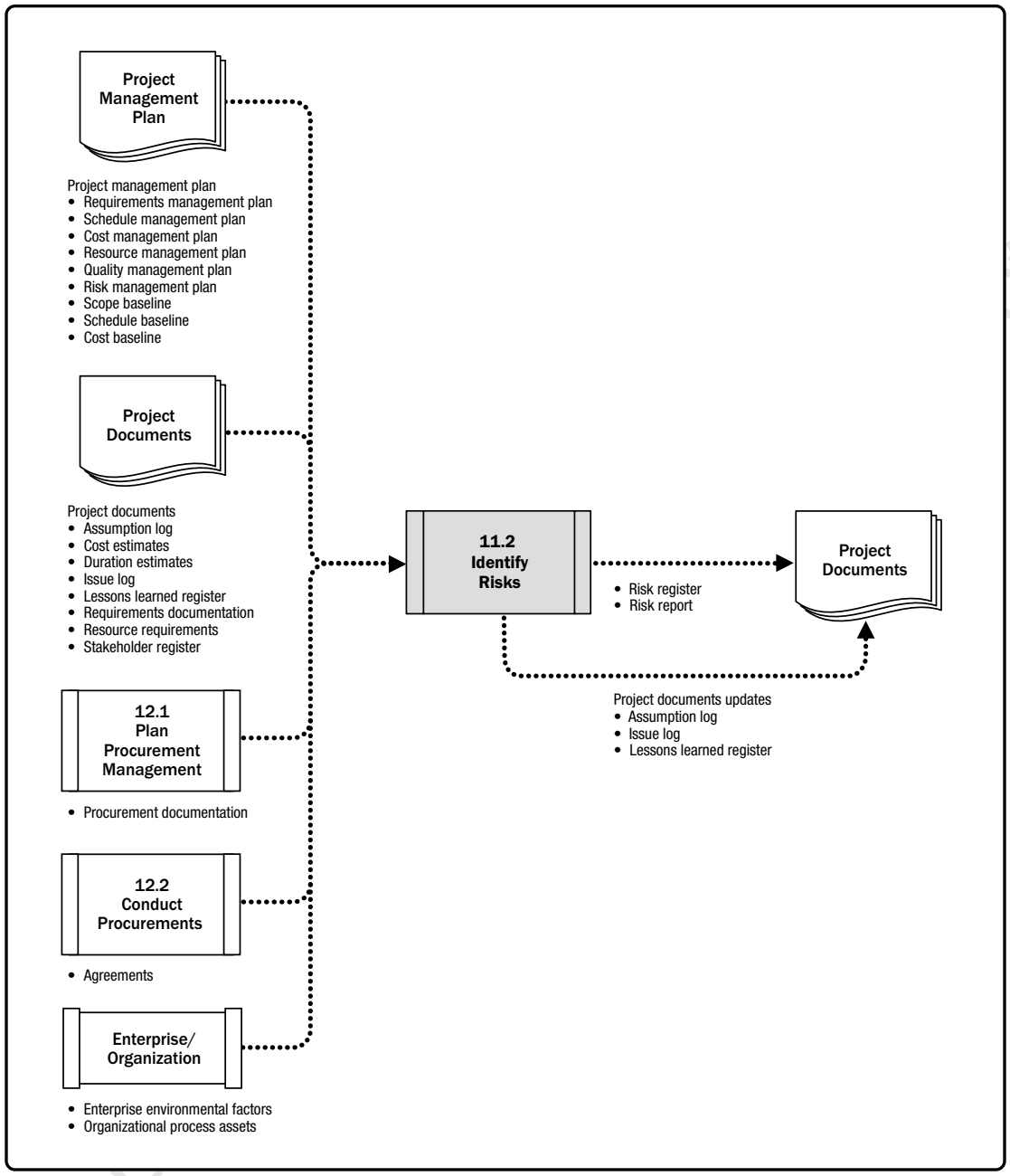

Figure 11-7. Identify Risks: Data Flow Diagram

Identify Risks considers both individual project risks and sources of overall project risk. Participants in risk identification activities may include the following: project manager, project team members, project risk specialist (if assigned), customers, subject matter experts from outside the project team, end users, other project managers, operations managers, stakeholders, and risk management experts within the organization. While these personnel are often key participants for risk identification, all project stakeholders should be encouraged to identify individual project risks. It is particularly important to involve the project team so they can develop and maintain a sense of ownership and responsibility for identified individual project risks, the level of overall project risk, and associated risk response actions.

When describing and recording individual project risks, a consistent format should be used for risk statements to ensure that each risk is understood clearly and unambiguously in order to support effective analysis and risk response development. Risk owners for individual project risks may be nominated as part of the Identify Risks process, and will be confirmed during the Perform Qualitative Risk Analysis process. Preliminary risk responses may also be identified and recorded and will be reviewed and confirmed as part of the Plan Risk Responses process.

Identify Risks is an iterative process, since new individual project risks may emerge as the project progresses through its life cycle and the level of overall project risk will also change. The frequency of iteration and participation in each risk identification cycle will vary by situation, and this will be defined in the risk management plan.

11.2.1 IDENTIFY RISKS: INPUTS

11.2.1.1 PROJECT MANAGEMENT PLAN

Described in Section 4.2.3.1. Project management plan components include but are not limited to:

- **Requirements management plan.** Described in Section 5.1.3.2. The requirements management plan may indicate project objectives that are particularly at risk.
- **Schedule management plan.** Described in Section 6.1.3.1. The schedule management plan may identify areas that are subject to uncertainty or ambiguity.
- **Cost management plan.** Described in Section 7.1.3.1. The cost management plan may identify areas that are subject to uncertainty or ambiguity.
- **Quality management plan**. Described in Section 8.1.3.1. The quality management plan may identify areas that are subject to uncertainty or ambiguity, or where key assumptions have been made that might give rise to risk.
- **Resource management plan**. Described in Section 9.1.3.1. The resource management plan may identify areas that are subject to uncertainty or ambiguity, or where key assumptions have been made that might give rise to risk.

- **Risk management plan.** Described in Section 11.1.3.1. The risk management plan provides information on risk-related roles and responsibilities, indicates how risk management activities are included in the budget and schedule, and describes categories of risk, which may be expressed as a risk breakdown structure (Figure 11-4).
- **Scope baseline**. Described in Section 5.4.3.1. The scope baseline includes deliverables and criteria for their acceptance, some of which might give rise to risk. It also contains the WBS, which can be used as a framework to structure risk identification techniques.
- **Schedule baseline.** Described in Section 6.5.3.1. The schedule baseline may be reviewed to identify milestones and deliverable due dates that are subject to uncertainty or ambiguity, or where key assumptions have been made that might give rise to risk.
- **Cost baseline.** Described in Section 7.3.3.1. The cost baseline may be reviewed to identify costs or funding requirements that are subject to uncertainty or ambiguity, or where key assumptions have been made that might give rise to risk.

11.2.1.2 PROJECT DOCUMENTS

Project documents that can be considered as inputs for this process include but are not limited to:

- **Assumption log.** Described in Section 4.1.3.2. Assumptions and constraints recorded in the assumption log may give rise to individual project risks and may also influence the level of overall project risk.
- **Cost estimates.** Described in Section 7.2.3.1. Cost estimates provide quantitative assessments of project costs, ideally expressed as a range, indicating the degree of risk, where a structured review of the documents may indicate that the current estimate is insufficient and poses a risk to the project.
- **Duration estimates.** Described in Section 6.4.3.1. Duration estimates provide quantitative assessments of project durations, ideally expressed as a range, indicating the degree of risk, where a structured review of the documents may indicate that the current estimate is insufficient and poses a risk to the project.
- **Issue log.** Described in Section 4.3.3.3. Issues recorded in the issue log may give rise to individual project risks and may also influence the level of overall project risk.
- **Lessons learned register. D**escribed in Section 4.4.3.1. Lessons learned about risk identified from earlier phases of the project are reviewed to determine whether similar risks might recur during the remainder of the project.
- **Requirements documentation.** Described in Section 5.2.3.1. Requirements documentation lists the project requirements and allows the team to identify those that could be at risk.

- **Resource requirements.** Described in Section 9.2.3.1. Resource requirements provide quantitative assessments of project resource requirements, ideally expressed as a range, indicating the degree of risk, where a structured review of the documents may indicate that the current estimate is insufficient and poses a risk to the project.
- **Stakeholder register.** Described in Section 13.1.3.1. The stakeholder register indicates which individuals or groups might participate in identifying risks to the project. It also details those individuals who are available to act as risk owners.

11.2.1.3 AGREEMENTS

Described in Section 12.2.3.2. If the project requires external procurement of resources, the agreements may have information such as milestone dates, contract type, acceptance criteria, and awards and penalties that can present threats or opportunities.

11.2.1.4 PROCUREMENT DOCUMENTATION

Described in Section 12.3.1.4. If the project requires external procurement of resources, the initial procurement documentation should be reviewed as procuring goods and services from outside the organization may increase or decrease overall project risk and may introduce additional individual project risks. As the procurement documentation is updated throughout the project, the most up to date documentation can be reviewed for risks. For example, seller performance reports, approved change requests and information on inspections.

11.2.1.5 ENTERPRISE ENVIRONMENTAL FACTORS

The enterprise environmental factors that can influence the Identify Risks process include but are not limited to:

- Published material, including commercial risk databases or checklists,
- Academic studies,
- Benchmarking results, and
- Industry studies of similar projects.

11.2.1.6 ORGANIZATIONAL PROCESS ASSETS

The organizational process assets that can influence the Identify Risks process include but are not limited to:

- Project files, including actual data,
- Organizational and project process controls,
- Risk statement formats, and
- Checklists from previous similar projects.

11.2.2 IDENTIFY RISKS: TOOLS AND TECHNIQUES

11.2.2.1 EXPERT JUDGMENT

Described in Section 4.1.2.1. Expertise should be considered from individuals or groups with specialized knowledge of similar projects or business areas. Such experts should be identified by the project manager and invited to consider all aspects of individual project risks as well as sources of overall project risk, based on their previous experience and areas of expertise. The experts' bias should be taken into account in this process.

11.2.2.2 DATA GATHERING

Data-gathering techniques that can be used for this process include but are not limited to:

- **Brainstorming.** The goal of brainstorming (see Section 4.1.2.2) is to obtain a comprehensive list of individual project risks and sources of overall project risk. The project team usually performs brainstorming, often with a multidisciplinary set of experts who are not part of the team. Ideas are generated under the guidance of a facilitator, either in a free-form brainstorm session or one that uses more structured techniques. Categories of risk, such as in a risk breakdown structure, can be used as a framework. Particular attention should be paid to ensuring that risks identified through brainstorming are clearly described, since the technique can result in ideas that are not fully formed.
- **Checklists.** A checklist is a list of items, actions, or points to be considered. It is often used as a reminder. Risk checklists are developed based on historical information and knowledge that has been accumulated from similar projects and from other sources of information. They are an effective way to capture lessons learned from similar completed projects, listing specific individual project risks that have occurred previously and that may be relevant to this project. The organization may maintain a risk checklist based on its own completed projects or may use generic risk checklists from the industry. While a checklist may be quick and simple to use, it is impossible to build an exhaustive one, and care should be taken to ensure the checklist is not used to avoid the effort of proper risk identification. The project team should also explore items that do not appear on the checklist. Additionally, the checklist should be reviewed from time to time to update new information as well as remove or archive obsolete information.
- **Interviews.** Individual project risks and sources of overall project risk can be identified by interviewing experienced project participants, stakeholders, and subject matter experts. Interviews (see Section 5.2.2.2) should be conducted in an environment of trust and confidentiality to encourage honest and unbiased contributions.

11.2.2.3 DATA ANALYSIS

Data analysis techniques that can be used for this process include but are not limited to:

- **Root cause analysis.** Root cause analysis (see Section 8.2.2.2) is typically used to discover the underlying causes that lead to a problem, and develop preventive action. It can be used to identify threats by starting with a problem statement (for example, the project might be delayed or over budget) and exploring which threats might result in that problem occurring. The same technique can be used to find opportunities by starting with a benefit statement (for example, early delivery or under budget) and exploring which opportunities might result in that benefit being realized.
- **Assumption and constraint analysis.** Every project and its project management plan are conceived and developed based on a set of assumptions and within a series of constraints. These are often already incorporated in the scope baseline and project estimates. Assumption and constraint analysis explores the validity of assumptions and constraints to determine which pose a risk to the project. Threats may be identified from the inaccuracy, instability, inconsistency, or incompleteness of assumptions. Constraints may give rise to opportunities through removing or relaxing a limiting factor that affects the execution of a project or process.
- **SWOT analysis.** This technique examines the project from each of the strengths, weaknesses, opportunities, and threats (SWOT) perspectives. For risk identification, it is used to increase the breadth of identified risks by including internally generated risks. The technique starts with the identification of strengths and weaknesses of the organization, focusing on either the project, organization, or the business area in general. SWOT analysis then identifies any opportunities for the project that may arise from strengths, and any threats resulting from weaknesses. The analysis also examines the degree to which organizational strengths may offset threats and determines if weaknesses might hinder opportunities.
- **Document analysis.** Described in Section 5.2.2.3. Risks may be identified from a structured review of project documents, including, but not limited to, plans, assumptions, constraints, previous project files, contracts, agreements, and technical documentation. Uncertainty or ambiguity in project documents, as well as inconsistencies within a document or between different documents, may be indicators of risk on the project.

11.2.2.4 INTERPERSONAL AND TEAM SKILLS

Interpersonal and team skills that can be used for this process includes but are not limited to facilitation (see Section 4.1.2.3). Facilitation improves the effectiveness of many of the techniques used to identify individual project risks and sources of overall project risk. A skilled facilitator can help participants remain focused on the risk identification task, follow the method associated with the technique accurately, ensure clear risk descriptions, identify and overcome sources of bias, and resolve any disagreements that may arise.

11.2.2.5 PROMPT LISTS

A prompt list is a predetermined list of risk categories that might give rise to individual project risks and that could also act as sources of overall project risk. The prompt list can be used as a framework to aid the project team in idea generation when using risk identification techniques. The risk categories in the lowest level of the risk breakdown structure can be used as a prompt list for individual project risks. Some common strategic frameworks are more suitable for identifying sources of overall project risk, for example PESTLE (political, economic, social, technological, legal, environmental), TECOP (technical, environmental, commercial, operational, political), or VUCA (volatility, uncertainty, complexity, ambiguity).

11.2.2.6 MEETINGS

To undertake risk identification, the project team may conduct a specialized meeting (often called a risk workshop). Most risk workshops include some form of brainstorming (see Section 4.1.2.2), but other risk identification techniques may be included depending on the level of the risk process defined in the risk management plan. Use of a skilled facilitator will increase the effectiveness of the meeting. It is also essential to ensure that the right people participate in the risk workshop. On larger projects, it may be appropriate to invite the project sponsor, subject matter experts, sellers, representatives of the customer, or other project stakeholders. Risk workshops for smaller projects may be restricted to a subset of the project team.

11.2.3 IDENTIFY RISKS: OUTPUTS

11.2.3.1 RISK REGISTER

The risk register captures details of identified individual project risks. The results of Perform Qualitative Risk Analysis, Plan Risk Responses, Implement Risk Responses, and Monitor Risks are recorded in the risk register as those processes are conducted throughout the project. The risk register may contain limited or extensive risk information depending on project variables such as size and complexity.

On completion of the Identify Risks process, the content of the risk register may include but is not limited to:

- **List of identified risks.** Each individual project risk is given a unique identifier in the risk register. Identified risks are described in as much detail as required to ensure unambiguous understanding. A structured risk statement may be used to distinguish risks from their cause(s) and their effect(s).
- **Potential risk owners.** Where a potential risk owner has been identified during the Identify Risks process, the risk owner is recorded in the risk register. This will be confirmed during the Perform Qualitative Risk Analysis process.
- **List of potential risk responses.** Where a potential risk response has been identified during the Identify Risks process, it is recorded in the risk register. This will be confirmed during the Plan Risk Responses process.

Additional data may be recorded for each identified risk, depending on the risk register format specified in the risk management plan. This may include: a short risk title, risk category, current risk status, one or more causes, one or more effects on objectives, risk triggers (events or conditions that indicate that a risk is about to occur), WBS reference of affected activities, and timing information (when was the risk identified, when might the risk occur, when might it no longer be relevant, and what is the deadline for taking action).

11.2.3.2 RISK REPORT

The risk report presents information on sources of overall project risk, together with summary information on identified individual project risks. The risk report is developed progressively throughout the Project Risk Management process. The results of Perform Qualitative Risk Analysis, Perform Quantitative Risk Analysis, Plan Risk Responses, Implement Risk Responses, and Monitor Risks are also included in the risk report as those processes are completed. On completion of the Identify Risks process, information in the risk report may include but is not limited to:

- Sources of overall project risk, indicating which are the most important drivers of overall project risk exposure; and
- Summary information on identified individual project risks, such as number of identified threats and opportunities, distribution of risks across risk categories, metrics and trends, etc.

Additional information may be included in the risk report, depending on the reporting requirements specified in the risk management plan.

11.2.3.3 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of this process include but are not limited to:

- **Assumption log.** Described in Section 4.1.3.2. During the Identify Risks process, new assumptions may be made, new constraints may be identified, and existing assumptions or constraints may be revisited and changed. The assumption log should be updated with this new information.
- **Issue log.** Described in Section 4.3.3.3. The issue log should be updated to capture any new issues uncovered or changes in currently logged issues.
- **Lessons learned register.** Described in Section 4.4.3.1. The lessons learned register can be updated with information on techniques that were effective in identifying risks to improve performance in later phases or other projects.

11.3 PERFORM QUALITATIVE RISK ANALYSIS

Perform Qualitative Risk Analysis is the process of prioritizing individual project risks for further analysis or action by assessing their probability of occurrence and impact as well as other characteristics. The key benefit of this process is that it focuses efforts on high-priority risks. This process is performed throughout the project. The inputs, tools and techniques, and outputs of the process are depicted in Figure 11-8. Figure 11-9 depicts the data flow diagram for the process.

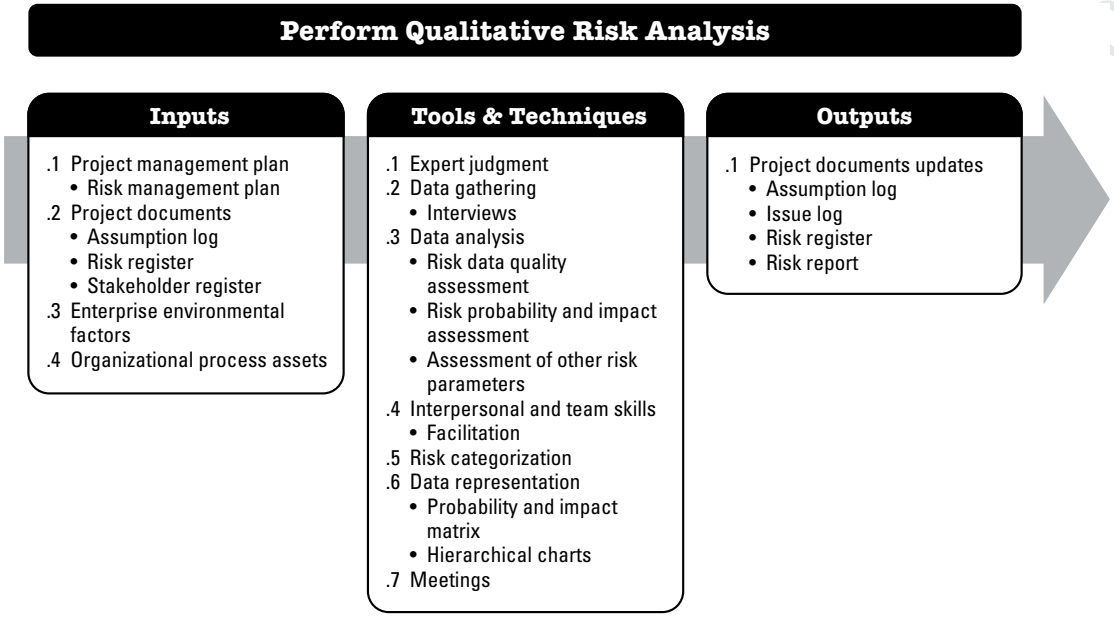

Figure 11-8. Perform Qualitative Risk Analysis: Inputs, Tools & Techniques, and Outputs

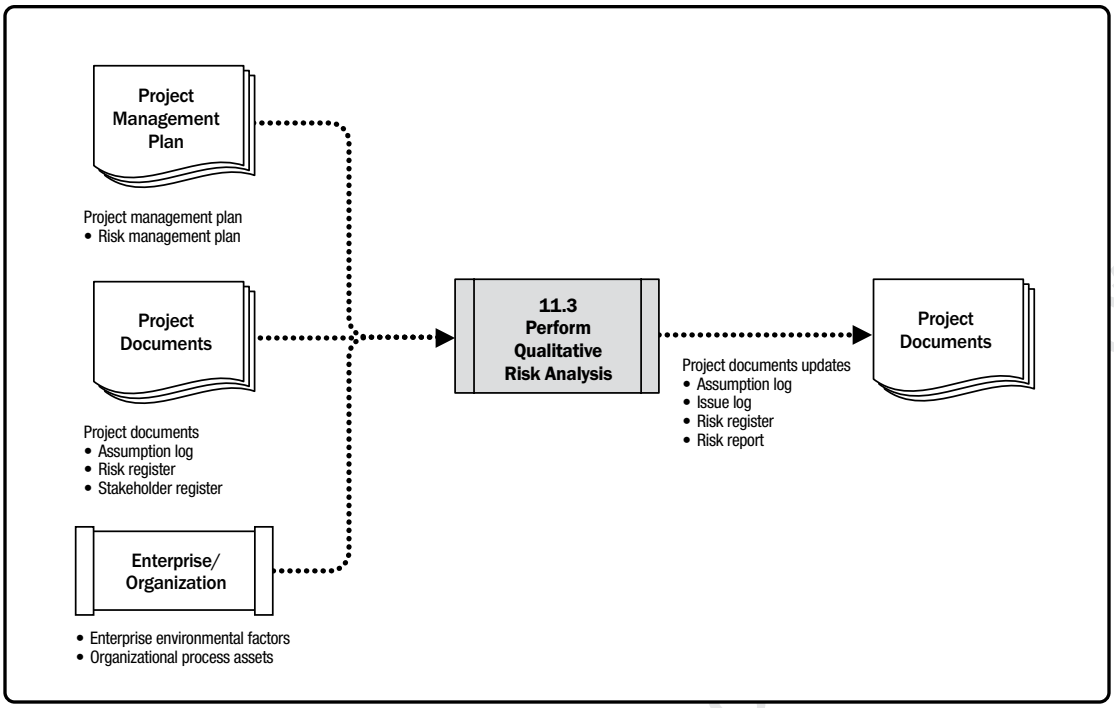

Figure 11-9. Perform Qualitative Risk Analysis: Data Flow Diagram

Perform Qualitative Risk Analysis assesses the priority of identified individual project risks using their probability of occurrence, the corresponding impact on project objectives if the risks occur, and other factors. Such assessments are subjective as they are based on perceptions of risk by the project team and other stakeholders. Effective assessment therefore requires explicit identification and management of the risk attitudes of key participants in the Perform Qualitative Risk Analysis process. Risk perception introduces bias into the assessment of identified risks, so attention should be paid to identifying bias and correcting for it. Where a facilitator is used to support the Perform Qualitative Risk Analysis process, addressing bias is a key part of the facilitator's role. An evaluation of the quality of the available information on individual project risks also helps to clarify the assessment of each risk's importance to the project.

Perform Qualitative Risk Analysis establishes the relative priorities of individual project risks for Plan Risk Responses. It identifies a risk owner for each risk who will take responsibility for planning an appropriate risk response and ensuring that it is implemented. Perform Qualitative Risk Analysis also lays the foundation for Perform Quantitative Risk Analysis if this process is required.

The Perform Qualitative Risk Analysis process is performed regularly throughout the project life cycle, as defined in the risk management plan. Often, in an agile development environment, the Perform Qualitative Risk Analysis process is conducted before the start of each iteration.

11.3.1 PERFORM QUALITATIVE RISK ANALYSIS: INPUTS

11.3.1.1 PROJECT MANAGEMENT PLAN

Described in Section 4.2.3.1. Project management plan components include the risk management plan as described in Section 11.1.3.1. Of particular interest in this process are the roles and responsibilities for conducting risk management, budgets for risk management, schedule activities for risk management, risk categories (often defined in a risk breakdown structure), definitions of probability and impact, the probability and impact matrix, and stakeholders' risk thresholds. These inputs are usually tailored to the project during the Plan Risk Management process. If they are not available, they may be developed during the Perform Qualitative Risk Analysis process and presented to the project sponsor for approval before use.

11.3.1.2 PROJECT DOCUMENTS

Project documents that can be considered as inputs for this process include but are not limited to:

- **Assumption log.** Described in Section 4.1.3.2. The assumption log is used for identifying, managing, and monitoring key assumptions and constraints that may affect the project. These may inform the assessment of the priority of individual project risks.
- **Risk register.** Described in Section 11.2.3.1. The risk register contains details of each identified individual project risk that will be assessed during the Perform Qualitative Risk Analysis process.
- **Stakeholder register.** Described in Section 13.1.3.1. This includes details of project stakeholders who may be nominated as risk owners.

11.3.1.3 ENTERPRISE ENVIRONMENTAL FACTORS

The enterprise environmental factors that can influence Perform Qualitative Risk Analysis include but are not limited to:

- Industry studies of similar projects, and
- Published material, including commercial risk databases or checklists.

11.3.1.4 ORGANIZATIONAL PROCESS ASSETS

The organizational process assets that can influence Perform Qualitative Risk Analysis include but are not limited to information from similar completed projects.

11.3.2 PERFORM QUALITATIVE RISK ANALYSIS: TOOLS AND TECHNIQUES

11.3.2.1 EXPERT JUDGMENT

Described in Section 4.1.2.1. Expertise should be considered from individuals or groups with specialized knowledge or training in the following topics:

- Previous similar projects, and
- Qualitative risk analysis.

Expert judgment is often obtained through facilitated risk workshops or interviews. The possibility of expert views being biased should be taken into account in this process.

11.3.2.2 DATA GATHERING

Data-gathering techniques that can be used for this process include but are not limited to interviews. Structured or semi-structured interviews (Section 5.2.2.2) can be used to assess the probability and impacts of individual project risks, as well as other factors. The interviewer should promote an environment of trust and confidentiality in the interview setting to encourage honest and unbiased assessments.