**The PACE Stages**

So far, you have been introduced to the PACE framework and learned how it provides a clear foundation and structure for data analysis projects. You also learned that PACE is an acronym; each one of the letters represents an actionable stage in a project: plan, analyze, construct, and execute. In this reading, you will learn more about the PACE workflow and discover how each stage of the process can help guide data analysis.

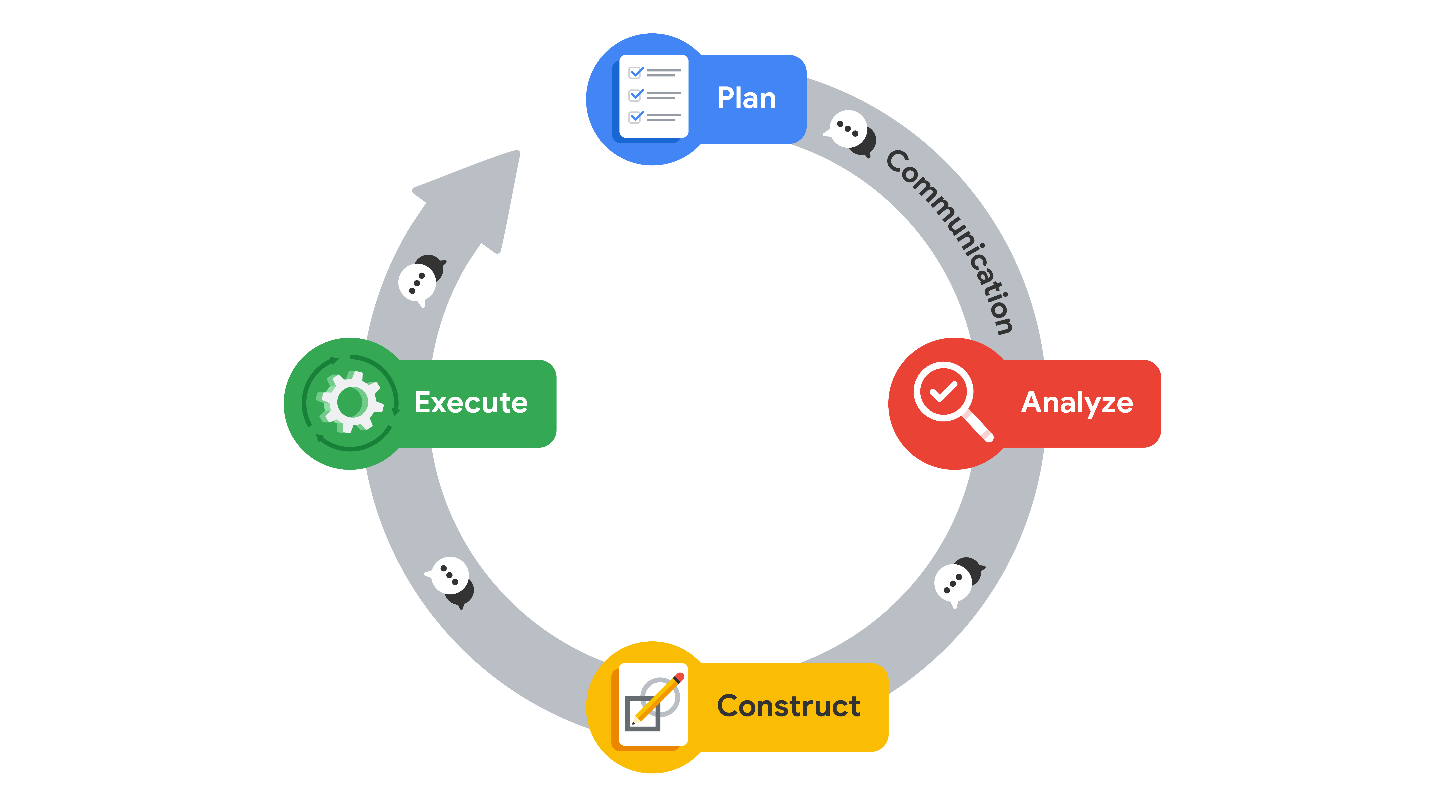
**Why do we use a workflow structure?**

As a general rule, data professionals rely on workflow structures to guide them through the duration of data projects. Within a large-scale project, there can be a number of tasks that require a certain order of operations. Identifying complexities and finding consistent ways to work together can make projects more efficient and enable more productive communication. Identifying these and other types of potential blockers early can help you plan and prepare resources in advance before they can negatively affect a project.

Our team of data professionals who assisted in creating this program developed a workflow structure called PACE. As you may recall, it’s an acronym for plan, analyze, construct and execute. The PACE model is flexible, allowing you to revisit each stage without interrupting the entire workflow. Through PACE, you will identify areas of action and when they will need to be considered. It offers data professionals a customizable scaffold that can support their efforts while working through every stage of a project.

**A closer look at the PACE model**

Let’s take a closer look at each stage of the PACE model.



**Plan**

At the beginning of a project, it is important to establish a solid foundation for success. Here you will define the scope of your project. This is when you will begin by identifying the informational needs of the organization. During the planning stage, you will have the widest viewpoint of a project. By assessing all of the factors and processes involved, you are mapping a path to completion, using your creativity to conceptualize a course of action. Here you will also take special note of tasks that may require an innovative approach within your workflow.

**Summary**: The planning stage is where you conceptualize the scope of the project and develop the steps that will guide you through the process of completing a project.

Here are a few examples of the types of planning stage tasks:

* Research business data
* Define the project scope
* Develop a workflow
* Assess project and/or stakeholder needs

**Analyze**

In the analyzing stage, you will interact with the data for the first time. Here you will acquire all of the data you will need for the project. Some datasets could come from primary sources within your organization. Others may need to be collected from secondary sources outside your company. You may even find that you need governmental or open source data. The analyzing stage is also where you will engage in exploratory data analysis or EDA. This involves cleaning, reorganizing and analyzing all of the necessary data for the project.

**Summary**: The analyzing stage is where you will collect, prepare, and analyze all of the data for your project.

Here are a few examples of the types of analyzing stage tasks:

* Format database
* Scrub data
* Convert data into usable formats

**Construct**

Just as the name suggests, the construction stage is all about building. In this stage of PACE, you will be building, interpreting, and revising models. Some projects will require machine learning algorithms to uncover correlations within your data. You will use these correlations to uncover information from the data that would otherwise go unused. These relationships can help your organization make informed decisions about the future.

**Summary**: In the construction stage you will build models that will allow you access to hidden relationships locked within data.

Here are a few examples of the types of construction stage tasks:

* Select modeling approach
* Build models
* Build machine learning algorithms

**Execute**

In the execution stage, you will put your analysis and construction into action. Here you will deliver your findings to the internal (inside of your organization) and external (outside of your organization) stakeholders. Quite often, this will involve stakeholders from the business-side of the companies you are working with. Presenting your findings is only a part of the execution stage. Stakeholders will provide feedback, ask questions, and make recommendations that you will collect and incorporate.

**Summary**: In the execution stage you will present the finding of your analysis, receive feedback, and make revisions as necessary.

Here are a few examples of execution stage tasks:

* Share results
* Present findings to other stakeholders
* Address feedback

**Communication and PACE**

Regardless of where you might be within the PACE workflow, communication is essential to moving the framework through to the realization of the project. One way to think of this is by visualizing the four stages of PACE as a completed circuit and with communication being represented by the flow of electricity.

At each stage, there will always be a need for communication to improve the workflow. This could be asking questions about your data, gathering additional sources, updating stakeholders on progress, or presenting findings and receiving feedback.

**Adaptability of PACE**

At the start of a project, the PACE model offers a good structure to guide you. At the beginning, you have the planning stage, where you gather the information and tools you will need and set up a framework to guide you. When you are analyzing data and constructing models, the analyzing and construction stages assist you. After these steps, the execution stage is where you share results and gather feedback.

Although the PACE model is first presented as stages in a certain order, you will discover that the open flow of communication allows you to easily move to the stages you need. New information and feedback can be incorporated at any part of the process. You might need to return to the analyzing stage to clarify some aspect of the data and then go to the executing stage to present this aspect to your stakeholders, without the need to construct new models. The PACE framework can be adapted to fit any project. Its adaptability will prepare you for a dynamic profession that requires a high degree of professional flexibility and communication.

**Key takeaways**

Data professionals need structured workflows to help them manage the large number of tasks within data projects. The PACE professional workflow was designed specifically for this program to assist you in developing your professional structures and practices. PACE functions like a completed circuit, with communication flowing between each stage. The design of PACE promotes flexibility, allowing for free movement between stages as needed.

# Top data professional communication practices

# The importance of communication and the PACE framework

You have learned about three key elements of communication: the purpose, the sender, and the receiver. You also learned that your message is at the heart of the relationship between purpose, sender and receiver. Your message is impacted by all these key elements of communication and each element affects your message in very different ways. In this reading, you will learn more about communication and analyze some examples of how to become a more effective communicator.

Over the course of a typical work day, you will interact with various stakeholders through a variety of correspondence. Some of your interactions will be through emails and messaging, others through meetings and one-on-one conversations. You could be speaking to a colleague about network architecture while receiving an email from a marketing executive inquiring about quarterly reports. Each interaction requires an individualized approach to ensure that your audience understands what you are trying to communicate.

Communication is important. It flows through each stage of PACE, whether collecting data, constructing models or sharing results. Regardless of where you are within the PACE  framework, revision and clarification are part of a thoughtful analysis. Throughout the stages of  PACE, stakeholders can offer feedback, pose questions, or ask for clarification. Here are five best practices to guide your communications through any stage of the PACE framework.

# Five tips for effective communication

## 1. Speak the language of your audience

Identify the needs of your audience. It is important to know the objectives of the person you are communicating with. Focusing on their needs allows you to gain insight and assess how technical the conversation should be. Consider the following questions:

* Why has this person contacted you?
* What does your stakeholder want from this interaction?
* What’s important to them, their team, or their organization?

In your role as a data professional, you will interact with a variety of stakeholders. When speaking to another data professional, the exchange can go deeper into technical concepts. When sharing information with an executive who may not be familiar with those more technical aspects of your work, you need to consider what is important to someone in an executive role. Determine what they know, what they need to know, and what might go beyond their level of involvement in a project.

* Break down technical concepts into simpler terms.
* Use shorter sentences so main ideas are easier to understand and remember.
* Use direct language and minimize embellishments or unnecessary detail.
* Pay attention to diverse backgrounds and respect the lived experiences of others.

**Pro tip**: Avoid jargon, acronyms, and technical “buzzwords” that could lead to confusion.

## 2. Invite questions and welcome feedback

A data professional in the workplace must expect feedback and questions. Since your recommendations can have an impact on the future decisions of your company and its employees, it is natural to want your work to be perfect. The reality is that everyone can use feedback–whether it is positive or points out areas for improvement. When you are deep into a task, focused on the details, it is possible to overlook something. Feedback is essential since no single person can envision every possible perspective. Another person’s feedback offers you a great way to gather insights for your personal growth and professional excellence. By accepting the challenge that feedback and questions present, you will strengthen your own skills and help the overall project.

* Merge your passion for finding solutions with the goals of the project.
* Continue to strive for greater understanding of the results.
* Elicit feedback and questions to improve communication about your projects.
* Consider opportunities to reflect on your communication skills.

**Pro tip**: Analyze feedback. Is it valid? Does the person have a complete understanding of the goals of the project or data analytical process? If not, set up an additional meeting to help clarify.

## 3. Be the connection to the data

You are your team’s direct connection to the insights your data offers. Your goal is to help other stakeholders understand the process and how it addresses their needs. When everyone understands the process, communication can be highly effective.

* Focus on the objectives to help others better understand your data process.
* Tell the story of the data with a compelling and cohesive narrative.
* Respond to questions in a timely manner.
* Demonstrate your value to the team.
* Find opportunities to address stakeholder questions.

**Pro tip**: Continue to proactively identify ways the data and tools you have access to can address the objectives of your team and drive new insights.

## 4. Let your visualizations help tell the story

Visualizations are one of the best ways to communicate ideas, especially when dealing with big data. Visual references help bring to life the details inside your data. Graphs, charts and infographics can promote general understanding. Later you will explore Tableau, a visualization tool that you can use to create compelling visuals from data.

* Be sure that your visuals tell the story within the data.
* Design visualizations for inclusivity.
* Use labels and text to clarify, not clutter. Use fonts that are easy to read.
* Use high contrast, shading, and other customizations to communicate your messages clearly.
* Offer handouts, slides, and other material in accessible formats.

**Pro tip**: Keep visualizations simple. When deciding what to include in a presentation, less is more.

## 5. Build positive professional relationships

When you consider the responsibilities and objectives of others, your communication will reflect that consideration. This builds credibility and influence in your workplace and allows you to continue growing throughout your career.

* Focus on what matters to your audience.
* Invite feedback and discussion.
* Be a trusted subject matter expert who communicates clearly and inclusively.
* Cultivate positive interactions to strengthen working relationships and improve morale.

**Pro tip**: When you are contacted by a stakeholder, be accessible and engaged in your communication.

## Key takeaways

Effective communication is important for data professionals. Regardless of where you are in the framework of a project, communication can inform and empower your stakeholders. Identify the needs of your audience and invite feedback. Remember that your role is to connect the data, technology and the stakeholders. Demonstrate your value by being available and ready to share insights in a simple way that promotes general understanding.

## Resources for more information

* [How to make your presentations accessible to all](https://www.w3.org/WAI/teach-advocate/accessible-presentations/): Suggestions from the Web Accessibility Initiative
* [Build accessible dashboards in Tableau](https://help.tableau.com/current/pro/desktop/en-us/accessibility_dashboards.htm): Tips for creating accessible dashboards

# Communication skills for data professionals

As you have learned, the PACE framework provides an initial structure to guide you through projects. Regardless of where you might be in the workflow, communication is what drives a project to its realization. As a data analytics professional, you will serve as the connection between data, business, and technology. The most effective way to make these connections is through communication.

Data professionals are often involved in organizational decision making. In order to fulfill their responsibilities, data professionals are required to communicate about data analysis with a variety of stakeholders.

The purpose of analytics training is to balance technical knowledge with effective communication so that you can gain and share insights from data. In this reading, you will learn best practices for communication and how you can improve your communication as a data analytics professional.

## Active Listening

As you begin your career in data analytics, you will spend a lot of time in meetings and in conversation. Many stakeholders are from different departments both inside and outside of your organization. The information shared during these interactions is valuable. Often, it’s where you gather insight into how the business operates, its goals, key milestones, and parameters within projects.

#### Why should I practice active listening?

* Invite understanding of others
* Develop empathy for others and their responsibilities
* Build a connection with colleagues
* Promote trust

When you are practicing active listening, you make the effort to understand the speaker’s point of view. Here are a few tips that can help you:

* **Be curious and consider all viewpoints.** You may hear suggestions or recommendations that differ from your own. While it’s important to listen to what is being said, it can be much more helpful to understand **why** the idea was shared. You may need to look beyond your personal or team goals in certain situations.
* **To be an active listener, be engaged.** Taking notes is a great way to stay involved during meetings. By doing so, you are also creating documentation that you can reference later. A good practice is to verify your notes with someone who attended the same meeting, ensuring that you have the same understanding of roles, responsibilities, and project goals.
* **Listen to respond.** Place a high value on the insights gained from others. Resist any tendency to formulate responses before the other person has finished talking. Give yourself time to consider what is being communicated. Often these ideas could spark creativity and innovative problem-solving.

### One-on-one and small groups

* **Schedule time to talk.** Set a time when you are able to focus and provide undivided attention. If you're not able to give the conversation the proper focus, reschedule.
* **Convey interest.** Show the other person that you are invested in the conversation. Make eye contact, focus on the speaker, and place your phone face down.
* **Check for alignment.** Make sure that you understand what is being said. For example, “What I am hearing you say is that\_\_\_\_\_\_\_\_. Is that correct?”
* **Demonstrate patience.** Not everyone will be able to follow your explanation of data processes. You may be asked to repeat or re-approach certain information.

## Asking Questions

Data professional work is not an automated solution generator. For data analysis to be effective, data professionals need to ask the correct questions. In fact, the entire data analytical process depends on it.

Asking questions is a powerful communication tool. Asking the right questions can lead to institutional learning and a fruitful exchange of ideas. Many times, questions invite innovation and initiate efforts that can help improve projects and overall workflow.

Asking questions builds rapport and trust among team members. The right questions can often help mitigate business risks by uncovering unforeseen pitfalls and hazards.

#### Why should I ask questions?

* Help you learn and grow
* Create rapport with stakeholders and make stronger connections
* Show others you are passionate about deepening your understanding of your work

### Here are a few tips to help guide your questioning.

### Ask better questions

* **Be sure that the answer hasn’t been provided already.** If you are new to a company or a team, this will be expected. If you are invited to a meeting, you can prepare by reviewing the frequently asked questions (FAQs) on the company website, company documents, and other provided resources.
* **Understand how best to ask questions in your team**. Many companies use an online messaging system. This is much less time consuming than a meeting, phone call, or email.
* **Ask questions that go after the bigger picture.** Each stakeholder has their own point of view on a project. Gaining insight into the responsibilities of other stakeholders helps to clarify the goals of the entire project.
* **Be sure your question is about gathering information or furthering the knowledge of the team**. Asking clarifying questions that are relevant to the project can benefit everyone. It’s also important to respect everyone in attendance and reserve questions about individual concerns for a one-on-one conversation.
* **Ask questions that can help clarify**. This helps to eliminate misunderstandings and open dialogues that can benefit everyone. If you miss a point or are having trouble understanding something, don’t be afraid to ask for the speaker to repeat it. If you would like additional information, just ask.

### Offer direct responses to questions

Here are a few tips to help you sharpen your communication skills:

* Time demands and deadlines require efficient communication
* Think before you respond
* Select the correct words to deliver your message
* Directly address the questions posed
* Be aware of your tone
* If communicating in-person or on camera, consider body language
* Be clear and concise

It’s also important to keep in mind that it’s ok to not know the answer to someone’s question. No one is expected to have all the answers all the time! If you are unsure about how to respond, let the person know that you will look into the issue and follow up with them in the near future. For example, you can say, “I don’t have that information at hand, but I’ll investigate and get back to you.”

## Key takeaways

In this reading, you learned that communication is present in all aspects of data professional work. By becoming an active listener that asks relevant questions, you enable more efficient communication and invite the perspective of other stakeholders.

# Consider assumptions, data limitations and presentations

In an earlier reading, you explored communication skills for data professionals. Beyond those practices, there are additional considerations that can strengthen communication and maximize your effectiveness to process and relay information. In this reading, you’ll learn about assumptions and limitations when working with data, and how they can impact the analytical process.

## Identify Assumptions and Limitations

The backgrounds, experiences, beliefs, and worldviews of people can influence the information contained within data. In your role as a data analytics professional, you will want to consider ways that these various factors can introduce bias.

Additionally, data professionals need to identify their own assumptions, which are things people believe to be true without examining them. If they are not recognized, assumptions can have a powerful effect on outcomes. As you progress through this program, you’ll experience more opportunities to explore this topic in greater detail. Here are a few questions that guide you in identifying assumptions:

### How can I identify assumptions?

* Is there something I am taking for granted?
* Am I assuming something here that I shouldn’t?
* Can I determine if the assumption is correct?

These questions about assumptions can easily be applied to communication. Without information, there is often a tendency to fill in the gaps in understanding with assumptions. The most effective methods to reduce the impact of assumptions are practicing active listening and effectively asking questions.

## Awareness of Data Limitations

As a data professional, you will encounter limitations within data that can impede your analysis. These limitations will need to be addressed before you can proceed. You will learn methods of addressing data limitations while gaining hands-on experience in these techniques throughout this program. To assist you in identifying data limitations, ask the following questions:

* Is the data complete? Are there missing values or sections?
* Are the datasets formatted correctly?
* Is this a sufficient sample size to conduct analysis of an entire population or group?
* What are the biases present in the data set?
* Does this data contain personally identifiable information? What steps will I take to protect this information?

Organizations also share in the responsibility of managing and overseeing data assets throughout the company. Commonly, these responsibilities are a part of data stewardship. As a data analytics professional, you will be accountable for data and data resources, but this is a shared responsibility. Most organizations appoint a high-level manager or executive to oversee these responsibilities across an organization.

## Sharing Findings

Sharing the findings of your data analysis is translating the results, concepts, and terms for wider audiences. When it comes to sharing the results of your analysis with stakeholders, there are some best practices that can help keep you on track:

* Craft results to the needs of your stakeholders. Communicate why this data will help them achieve their goals.
* Determine the visualizations and/or dashboards that are the most effective. What data will you need to show and how do you want stakeholders to interact with it?
* Think about the design carefully. A simple yet visually appealing approach to visualizations is always the best.
* Use a hierarchy of data in your visualizations/dashboards. Information that is most important should be easily accessible, but you should provide a path for more details.

### What should I keep in mind when I share results?

* What information is the most important to my audience?
* What is the most efficient way to share with the tools available and the time I’m allotted?
* What can I do to make the key points effectively?

### Presentations

Presenting information clearly and effectively is key to a data scientist's workflow. Communication skills that pertain to presentations include but are not limited to: the structure of your presentation, slide design, the tone of your voice and the body language you convey, and more. It is also important to consider accessibility as you are creating any assets. Check with your organization about accessibility guidelines. You may also refer to online resources like [U.S. accessibility guidelines](https://accessibility.digital.gov/) or [The World Wide Web Consortium’s (W3C) web accessibility initiative](https://www.w3.org/WAI/).

#### Tips for presentations

* Structure your presentation. Be sure there is a logical structure: a beginning, middle, and end.
* Presentation slides are not scripts. Don’t read or put complete paragraphs on presentation slides.
* Make sure your data can be understood visually and with the potential accessibility challenges of the audience taken into account.
* Focus most on the points your data illustrates.
* Share one—and only one—major point from each chart.
* Label chart components clearly.
* Visually highlight “Aha!” zones.
* Write a slide title that reinforces the data’s point.

A solid presentation can help others understand the findings of your data analysis and ensure that you are effectively communicating.

# The value of the PACE strategy document

You have learned about the PACE workflow and how it helps bring structure to the data analytical process. This reading introduces the PACE strategy document. It is a resource designed to assist you in this program and throughout your career as a data analytics professional.

## Why do I need the PACE strategy document?

The videos, readings, activities, and projects in this program are a foundation for advancing your data skills and knowledge. But, success in the data career space involves more than data analytical skills. Data professionals are often involved in organizational decision making. This requires them to communicate about data and the results of data analysis with a variety of stakeholders.

In the advanced data analysis program, you’ll be introduced to different aspects of the field, which data analytics professionals encounter. Concepts and skills are arranged in a logical order and organized into courses that will prepare you for more advanced analytical tasks.

After each course, you'll be asked to develop an end-of-course project that demonstrates your mastery of expected data professional skills, such as your analytical and communication skills. To assist, you will receive an individual PACE strategy document for each of the course projects. Inside the PACE strategy documents, you’ll find helpful tips and opportunities to reflect on what you have learned and consider how to apply it to your job as a data analytics professional. Additionally, your responses within these strategy documents will help you create executive summaries that will inform decision makers and stakeholders of a project’s progress.

PACE strategy documents provide evidence of your expanded knowledge and can serve as a powerful motivator when acquiring new skills. Commitment to an educational program requires dedication and persistence. Your knowledge base and technical proficiency will be expanded through this journey. The gradual nature of personal growth makes it difficult to monitor day-to-day progress. Each PACE strategy document is designed to function as a record of your progress while developing new data analytical skills. The strategy documents will also help you improve communication skills by providing thoughtful questions designed to help identify and detail each step of your data analysis.

## A look at the PACE strategy document

You will find a PACE strategy document included with the end-of-course project for each course in this program. Even though these strategy documents were designed for the specific needs of a particular course, there are consistent elements in each of them.

### Instructions

In the “Instructions” section of the PACE strategy document, you will find general guidelines and special considerations for completing the document.

### Course project recap

In this section, the goals for each end-of-course project are outlined. By completing each task and the items needed for your projects, you will achieve these goals. No matter which workplace scenarios you select, the project goals will align with the knowledge you have gained in that course.

### Relevant interview questions

This section of the PACE strategy document builds context around your data tasks. The questions unlock a deeper understanding of data analytics, previewing the way you'll be able to speak after completing each course and its corresponding projects. During your job search, these questions can help you prepare for the types of questions you'll encounter during technical interviews.

### Review relevant course materials

In this section of the PACE strategy document you are given links to course materials you can review and reference as you complete each project. Links to relevant course materials provide you with quick access to relevant course information you need to complete your project.

### Reference guide

In the “Reference Guide,” you can find an outline of tasks required to complete the end-of-course project and the stage of PACE that each task addresses. Additionally, you can refer to the material when you are on the job completing similar tasks and projects later in your career.

### Data project questions & considerations

The questions in this section are specific to different stages of the PACE workflow. These “Data Project Questions & Considerations“ directly correspond to the questions you will encounter in the Jupyter notebooks for courses 2 - 6.  The answers you give to these questions will help you map out your thought process through each stage of the project.

## PACE strategy documents and Jupyter notebooks

Each end-of-course project  will also include a specially created Jupyter notebook containing helpful tips to assist you when programming project elements. Similar to the strategy documents, each notebook includes thought-provoking questions that will help guide you through the tasks of each end-of-course project. You find some questions appear in both locations, signifying relevance in both areas of the project. The information in these documents can be referenced together during the executing stages of each project to produce executive summaries to inform your team members and stakeholders.

## The benefits of the PACE strategy documents

Gathering content for a portfolio can be challenging without the proper resources. This is where preserving detailed records of your decision making may pay off. The more you consider the questions at each stage of a project, and preserve thoughtful responses, the more valuable these PACE strategy documents can be for  your future. Each PACE strategy document offers you a wealth of content that you can use to create a cohesive and branded portfolio. By creating a collection of your thoughts and internal processes, you develop a valuable resource you can reference throughout your career.

# Communicate objectives with a project proposal

In this reading, you will continue examining communication within the data workspace. As you have learned, communication is present in all aspects of data professional work. As projects progress, the expectations, resources, or even team members can change. This will require adjustments within a project that can impact the overall workflow and delivery date.

You have also learned about the scalability of PACE (Plan, Analyze, Construct, and Execute). Through its framework, projects can be accessed globally, outlining the overall tasks that are needed for completion. Concurrently, each individual task within a project can be broken down into smaller actions. When working within a data team, the tasks in a project are often delegated between different data professionals. The need for sharing, collaborating, and communicating updates is therefore a necessity for data professionals and all of the stakeholders involved in a project.

Even with the best preparation, most projects will encounter unexpected events. It is important for a data team to adapt, pivot, and/or plan in light of these situations. A **project proposal** can provide the structure and communication needed for tracking tasks. In addition, project proposals are beneficial for teams when facing challenges that require a high degree of flexibility.

## Project proposals

A project proposal's main function is to outline objectives and requirements. Project proposals present ideas in more detailed and actionable segments often called **milestones**. Proposals are commonly a collaboration, created with input from team members and other stakeholders. It may also be the case that project proposals are shared with clients or executives to gain approval and inform them of a project’s path to completion. Project proposals are used across a multitude of industries and organizations. Although the design and layout of project proposals can vary, there are key elements that are common among them.

### Sample project proposal

The sample project proposal, linked below, deals with an imagined wildfire predictability project undertaken by the U.S. National Parks Service. Use this document as a reference as you review each of the following sections.

This project proposal’s audience is the National Park Service’s data team. The purpose is to gather a comprehensive list of tasks that will be needed to be carried out and divide them into smaller actionable groupings or milestones. Project proposals assist project managers in setting up task tracking, scheduling, and allocating resources. Furthermore, they serve as a reference for the team and as a valuable tool when new members are added to the project.

To access the sample project proposal, click the link below and select “Use Template.”

Link to sample project proposal: [Wildfire prediction project proposal](https://docs.google.com/presentation/d/1HLAt4BcHJIBTCF9tqmeo0lJ06DTUmogEQPvXJqPXu68/template/preview?resourcekey=0-PEsL4_EwO-nZtVA70rM0cA#slide=id.g1467dd8d281_0_1)

OR

If you don’t have a Google account, you can download the file directly from the attachment below.

[Wildfire prediction project proposal.pdf](https://d3c33hcgiwev3.cloudfront.net/d9n_vlu_SyWM21cWW4Z19g_001b4422deba4fc198f95b8bd5ca03f1_Wildfire-prediction-project-proposal.pdf?Expires=1687996800&Signature=LIwoYWjYy7Z9x9G8rUO5avhG0txW3eh5Asw4PABDZpjUKHlxB9wV7mCs9UklS3IBWqc4OJAt7cIxfY9Ta5ojCpL5LTcIl4WbXDU25OJkB47oMW~2piPpbBJ3aXrSu8LVnM6vt1~Xi9CvXl6qvRbXeYPlanJi3blGctljhTAe-es_&Key-Pair-Id=APKAJLTNE6QMUY6HBC5A" \t "_blank)

[PDF File](https://d3c33hcgiwev3.cloudfront.net/d9n_vlu_SyWM21cWW4Z19g_001b4422deba4fc198f95b8bd5ca03f1_Wildfire-prediction-project-proposal.pdf?Expires=1687996800&Signature=LIwoYWjYy7Z9x9G8rUO5avhG0txW3eh5Asw4PABDZpjUKHlxB9wV7mCs9UklS3IBWqc4OJAt7cIxfY9Ta5ojCpL5LTcIl4WbXDU25OJkB47oMW~2piPpbBJ3aXrSu8LVnM6vt1~Xi9CvXl6qvRbXeYPlanJi3blGctljhTAe-es_&Key-Pair-Id=APKAJLTNE6QMUY6HBC5A" \t "_blank)

### Elements of a project proposal

Each project proposal contains important information that a team will need to consider before work begins. Below is a brief explanation of some common sections you will find in project proposals. Note that the format of project proposals will vary, so not every section described here will be included in every project proposal.

**Project title:** The title of the project is prominent, usually placed near the top of a document. Effective titles are short and purposeful. Depending on the context and circumstance surrounding a project, the title on a project proposal can change over time.

**Project objective:** The objective statement is a one to three sentence explanation of what the project is trying to achieve.

**Milestones:** Milestones are groupings of tasks within a project, breaking the work needed into smaller, manageable goals. Milestones assist in the delegation and scheduling of work that needs to be completed within projects.

* The milestones in the provided example are representing the end-of-course projects in future courses.

**Tasks:** Tasks detail the work that needs to be completed within a milestone.

* In the provided example, the tasks parallel some of the work you will complete in future end-of-course projects.

**Outcomes:** Outcomes are the completed actions or results that allow a project to continue.

**Deliverables:** Deliverables are items that can be shared amongst team members or with stakeholders. These are the end products of work undertaken for a project.

**Stakeholders:** The individuals or groups who are directly involved and have a vested interest in the success of a project. Input from stakeholders can serve as a basis for making decisions throughout a project.

**Estimated time:** At the beginning of a project, the time needed to complete milestones is estimated. As a project develops, these estimates will often need to be updated to account for adjustments to timelines or changes in team members.

## Overview

You will discover that PACE strategy documents are a great reference when working on project proposals. During your end-of-course projects, you’ll be presented with questions that will assist you in identifying the planning, analyzing, constructing and executing stages. Within your responses you’ll discover the information needed to create a solid project proposal. The more time you spend considering and answering each question, the more information you’ll have available to you when creating project proposals.

## Key takeaways

A project proposal is a plan of action, describing what needs to be accomplished and how to achieve your intended goals and outcomes. Within these documents, you'll encounter milestones, deliverables, timelines, and schedules. In proposals, purpose and scope are outlined, giving a suggested method for approaching the tasks necessary to complete a project. It is important to keep project proposals updated as the scope and objectives of a project change, as well as the needs of stakeholders.

# Connect PACE with executive summaries

In this reading, you will continue to examine communication within the data workspace. In this course, you explored the PACE (Plan, Analyze, Construct, Execute) workflow and how it can help guide projects. Through PACE, the tasks and deliverables of a project are clearly identified and recorded in a PACE strategy document. The information identified in the PACE document is essential to the data professionals working on the necessary tasks. Also, decision makers may need to know information about a project, as you discovered in the RACI (Responsible, Accountable, Consulted, and Informed) matrix readings earlier in the course.

Regardless of workflow, data professionals need ways to share and communicate plans, updates, and summaries about projects. A common document called an executive summary is used to update decision makers who may not be directly involved in the tasks of a project. In your role as a data professional, you will often be involved in creating executive summaries.

## Executive summaries

Executive summaries are documents that collect the most important points contained in a longer plan or report. These summaries are common across a wide variety of businesses, giving decision makers a brief overview of the most relevant information. They can also be used to help new team members become acquainted with the details of a project quickly. The format is designed to respect the responsibilities of decision makers and/or executives who may not have time to read and understand an entire report. There are many ways to present information within an executive summary, including software options built specifically for that purpose. In this program, you will be focusing primarily on a one page format within a presentation slide. Regardless of how they are created, there are some items that are commonly included.

### Elements of an executive summary

The provided sample executive summary deals with an imagined wildfire predictability project undertaken by the U.S. National Park Service. The intended audience of this summary is a group of decision makers from many different departments within the National Park Service. The purpose of this summary is to share the insights gained through data analysis of wildfires in the US. Each section delivers a short statement without embellishment. This allows decision makers who are often short on time the ability to quickly grasp the most relevant points about a project. Reference this document as you review each of the following sections.

Below you will find a sample executive summary for an imagined project on wildfire predictability.

To access the sample executive summary, click the link below and select “Use Template.”

Link to sample executive summary: [Wildfire prediction project executive summary](https://docs.google.com/presentation/d/1FCEK660dRJ3aLm7P0mOBaiUTeZ9kopPDx2P-LOGdWt4/template/preview?resourcekey=0-peLLpo6s5dU8RLGAeZkr8g#slide=id.g146c7616c4c_0_24)

OR

If you don’t have a Google account, you can download the file directly from the attachment below.

[Wildfire prediction project executive summary.pdf](https://d3c33hcgiwev3.cloudfront.net/BlAauqyYRC6-ibxU2mzL3A_2725d132ce7f46e286304346377acdf1_Wildfire-prediction-project-executive-summary.pdf?Expires=1687996800&Signature=WHq8a8GuNPtbiaIE4oiLiaFHUMzEEIVGbQ5j76A6TwY-mjuhyIPqQ6QpLORtNex2-tEM9F3rfh8YmSrGX7MNLcRoyXSWdvpF4LMSfQzunmxryc8HDoo3OzKaPzTJBPhIS6EbR3eyJ~~XoyAewq8i85N2IUeOmSd97ccyP0sQ1TY_&Key-Pair-Id=APKAJLTNE6QMUY6HBC5A" \t "_blank)

[PDF File](https://d3c33hcgiwev3.cloudfront.net/BlAauqyYRC6-ibxU2mzL3A_2725d132ce7f46e286304346377acdf1_Wildfire-prediction-project-executive-summary.pdf?Expires=1687996800&Signature=WHq8a8GuNPtbiaIE4oiLiaFHUMzEEIVGbQ5j76A6TwY-mjuhyIPqQ6QpLORtNex2-tEM9F3rfh8YmSrGX7MNLcRoyXSWdvpF4LMSfQzunmxryc8HDoo3OzKaPzTJBPhIS6EbR3eyJ~~XoyAewq8i85N2IUeOmSd97ccyP0sQ1TY_&Key-Pair-Id=APKAJLTNE6QMUY6HBC5A" \t "_blank)

**Project title:** A project's theme is incorporated into the executive summary title to create an immediate connection with the target audience.

**The problem:** A statement that focuses on the need or concern being targeted or addressed by the project. Note, also, that the problem can also be referred to as the hypothesis that you’re trying to prove through data analysis.

**The solution:** This statement summarizes a project’s main goal. In this section, actions are described that are intended to address the concerns outlined in the problem statement.

**Details/Key Insights:** The purpose of this section is to provide any additional background and information that may assist the target audience in understanding the project's objectives. Determining what details to include depends heavily on the intended audience. It may also be the case that you choose to include some project reflections.

**Next steps/Recommendations:** Information that supports the intended actions the team plans to take. This can also include recommendations for decision makers based on the insights gained over the course of the project. In this section, a data professional may also include general project reflections. When you are adding to this section, please add at least one point for recommendations and one for the suggested next steps.

You will discover that PACE strategy documents are a great reference when working on executive summaries. When planning, analyzing, constructing, and executing your end-of-course and capstone projects, the PACE strategy documents provide questions to guide you. The information in your responses will assist you in creating an executive summary that will inform decision makers.The more time you spend considering and answering each question, the more information you’ll have available to you.

## Key takeaways

Executive summaries are important ways to share information with decision makers, clients, and executives. These documents include a summarized version of the most important information within a project or plan of action. The executive summary is usually broader in scope, not focusing on specific responsibilities or tasks. The executive summary summarizes the status of a project and its discoveries, describing a problem and proposing a solution.

# Glossary terms from week 4

# Terms and definitions from Course 1, Week 4

**PACE workflow**:A framework that provides an initial structure to guide the process of data analytics; PACE stands for plan, analyze, construct, and execute

**Plan stage**:Stage of the PACE workflow where the scope of a project is defined and the informational needs of the organization are identified

**Analyze stage**:Stage of the PACE workflow where the necessary data is acquired from primary and secondary sources and then cleaned, reorganized, and analyzed

**Construct stage**:Stage of the PACE workflow where data models and machine learning algorithms are built, interpreted, and revised to uncover relationships within the data and help unlock insights from those relationships

**Execute stage**: Stage of the PACE workflow where a data professional will present findings with internal and external stakeholders, answer questions, consider different viewpoints, and make recommendations

# Terms and definitions from previous weeks

## A

**Active listening:** Refers to allowing team members, bosses, and other collaborative stakeholders to share their own points of view before offering responses

**Aggregate information**:Data from a significant number of users that has eliminated personal information

**Analytics Team Manager**: A data professional who supervises analytical strategy for an organization, often managing multiple groups

**Artificial intelligence (AI):** Refers to computer systems able to perform tasks that normally require human intelligence

## B

**Business Intelligence Analyst**: (Refer to **Business Intelligence Engineer**)

**Business Intelligence Engineer:** A data professional who uses their knowledge of business trends and databases to organize information and make it accessible; also referred to as a Business Intelligence Analyst

## C

**Chief Data Officer**: An executive-level data professional who is responsible for the consistency, accuracy, relevancy, interpretability, and reliability of the data a team provides

## D

**Data anonymization**: The process of protecting people's private or sensitive data by eliminating PII

**Data cleaning**: The process of formatting data and removing unwanted material

**Data Engineer:** A data professional who makes data accessible, ensures data ecosystems offer reliable results, and manages infrastructure for data across enterprises

**Data professional**: Any individual who works with data and/or has data skills

**Data science**: The discipline of making data useful

**Data Scientist**: A data professional who works closely with analytics to provide meaningful insights that help improve current business operations

**Data stewardship:** The practices of an organization that ensure that data is accessible, usable, and safe

## E

**Edge computing**: A way of distributing computational tasks over a bunch of nearby processors (i.e., computers) that is good for speed and resiliency and does not depend on a single source of computational power

## H

**Hackathon:** An event where programmers and data professionals come together and work on a project

## I

**Interpersonal skills:** Traits that focus on communicating and building relationships

## J

**Jupyter Notebook:** An open-source web application used to create and share documents that contain live code, equations, visualizations, and narrative text

## M

**Machine learning:** The use and development of algorithms and statistical models to teach computer systems to analyze patterns in data

**Mentor:** Someone who shares knowledge, skills, and experience to help another grow both professionally and personally

**Metrics**: Methods and criteria used to evaluate data

## N

**Nonprofit**: A group organized for purposes other than generating profit; often aims to further a social cause or provide a benefit to the public

## O

**Open data**: Data that is available to the public and free to use, with guidance on how to navigate the datasets and acknowledge the source

## P

**Personally identifiable information (PII):** Information that permits the identity of an individual to be inferred by either direct or indirect means

**Python**: A general-purpose programming language

## R

**RACI chart**: A visual that helps to define roles and responsibilities for individuals or teams to ensure work gets done efficiently; lists who is responsible, accountable, consulted, and informed for project tasks

## S

**Sample:** A segment of a population that is representative of the entire population

## T

**Tableau**: A business intelligence and analytics platform that helps people visualize, understand, and make decisions with data