

The Role of Critical Thinking in Project Management¹

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Project managers are drivers by nature. They are not typically satisfied to hear an issue, and simply wait for resolution to come their way. Most successful PMs want to dig in and understand the problem they are facing, how it impacts their project and most importantly, how to resolve it. More often than not, however, the PM isn't the subject matter expert on the team. We rely on the knowledge and skills of others to produce project deliverables and develop solutions. The PM's role is predominantly to manage; track the issues, report the impact and facilitate resolution. It is in this facilitation where project managers can bring value and realize the benefits of critical thinking.

Critical thinking, in the simplest form, is the process of using logic and reasoning to remove bias and opinion, and fully understand a topic. Project teams can benefit greatly by operating from this fact-based viewpoint, especially considering the varied skills and responsibilities of the team members. Clarity around the facts and finely articulated specifics are less likely to create confusion, miscommunication, rework, and unnecessary stress.

Exploring the project lifecycle leads to endless opportunities for improvement by way of critical thinking as well. During project initiation, does it make sense to remove partiality from our Objective Statement? As Plan and Design progresses, should PMs challenge the status quo to ensure that more creative solutions have been considered? During the Execution Phase is clearly a great place to ensure the team is working from a foundation of fact, and the Monitoring and Controlling phase is worthless if what is being monitored is based on an individual or team bias versus relevant metrics and measurements. Clarity in all of these areas is critical and can mean the difference between success and failure.

There are several critical thinking tools in use by project managers every day, although we may not necessarily recognize them as such. These are the more basic tools, which attempt to provide a template to walk users through the critical thinking process. One example is the “**5 Whys**”, where the facilitator simply continues to ask why until the team has reached the root cause.

Example:

- Why did my car not start?
 - Because my battery was dead (Contributing Cause)
- Why was my battery dead?
 - Because my dome light was left on all night (Contributing Cause)

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- Why was my dome light on all night?
 - Because my car door was left open (Contributing Cause)
- Why was my car door left open?
 - Because the kids were playing in the car (Contributing Cause)
- Why were my kids playing in the car?
 - Because I did not lock the doors to the car (Root Cause)

Each contributing cause is further drilled down until a final cause for an issue is discovered. Five is the typical number of questions one asks, but it can be seven or three or whatever number is needed to get through the contributing causes and focus on the root cause.

Another simple example is a **Cause and Effect diagram**, also known as a Fishbone or Ishikawa diagram, named so for Kaoru Ishikawa, its creator. This diagram places the general contributing factors along branching lines or “bones” on the diagram, typically items like Materials, Process, People, Equipment, Environment, (although there could be others) all angled towards the output or “head” of the fishbone, which typically is the effect or problem one is trying to solve. This technique forces the team to think about all of these items individually and ask, “How could this category cause or potentially create this problem?” The tool is very helpful in organizing thoughts and encouraging dialogue.

The **Failure Modes and Effects Analysis (FMEA)** is another example of a common critical thinking tool. Here a user lists all the potential failures a process could have, and then scores them on Severity, Occurrence and Detection. Those scores are combined into a Risk Priority Number (RPN) and each failure is ranked highest to lowest. The goal is to identify what problems may occur in a process and develop controls to mitigate the most impactful ones.

Each of these more common tools are very useful when working to get a team to think about the issues and challenges of a project. However, none of these tools will inherently get to the right answer without the appropriate thought process. As with anything, poorly thought-out inputs will lead to poor conclusions. The broader challenge then becomes, “How do we do a better job of thinking critically?”

The foundation of any critical thinking exercise rests on basic reasoning, which falls into two categories: Inductive Reasoning and Deductive Reasoning. Inductive reasoning is inherently uncertain. It’s based on and deals with probabilities, either formally, as in a statistical analysis, or informally, as in a certain person’s own experience. An example of the latter may be a six foot tall movie theater patron with a child’s 12 and under ticket. Most children 12 and under are not that tall, so it may be safe to assume that the patron is older than 12. In most cases, that would be true, but it is certainly not always the case.

Deductive reason, also referred to as “Top Down” logic, is a logical sequence of statements that are believed to be true, and if they are true, then the final statement or conclusion must be true. An example may be:

- All mammals breathe air

- Dolphins are mammals
- Dolphins breathe air

Top down logic has become popular in crime stories like Sherlock Holmes, and is a great technique when the statements made are inarguably accurate. However, any use of deductive reasoning should be evaluated for validity and soundness.

Arguments can have two accurate statements, but may lead to an inaccurate conclusion.

Example:

- All birds have feathers
- Feathers allow birds to fly
- All birds can fly

Both statements leading to our conclusion may seem correct through traditional observation and logic, but clearly not all birds can fly. This is an example of an unsound argument and any time deductive reasoning is used, it should be verified and scrutinized for accuracy.

If Inductive and Deductive reasoning provide a roadmap on how to explore any information provided through discovery, then Socratic Questioning is the means for getting to that information. Socratic Questioning is one of the more widely accepted methodologies in exploring problems through logic. It is named for the Greek philosopher Socrates and his Socratic Paradox, which was “The only thing that I truly know is that I know nothing”. According to Socrates, all wisdom begins with wondering, so in order to attain such wisdom, one must admit ignorance. His approach when discussing subjects with experts in their field was to ask questions to explore the topic. He found that nothing was so much of a fact that he could not bring up counter points, or argue from alternate perspectives. He believed that true wisdom came from recognizing that he knew nothing, so he could be open to everything.

Socratic questioning as a methodology allows users to explore complex ideas and concepts openly and directly. It exposes assumptions and opinions, and allows us to distinguish what we know from what we do not know.

There are six types of Socratic Questions:

- Conceptual Clarification
- Probing Assumptions
- Probing Reason, Evidence and Rationale
- Questioning Viewpoints and Perspectives
- Probing Implications and Consequences
- Questioning the Question

Conceptual Clarification questions are the basic “Tell me more” type of questions. The user asks the team to provide more information on exactly what is being said. “Help me understand” or “what does that mean” are examples of Conceptual

Clarification. The facilitator tries to go deeper into the topic, to ensure that all participants are clear on exactly what is being stated and that any other potential interpretations are clarified and/or corrected. These questions will lead the team down some of the other avenues below.

A second type is **Probing Assumptions**. Here, the team is looking to discover the assumptions and presuppositions founding the argument, and uncover what is supported by fact. “Please explain why or how...” or “What else could we assume if...” are effective ways to pull assumptions out of a statement and lead the team down a fact based road. Often times it is the team’s own assumptions, assumed to be fact, that guard the truth and stifle creative solutioning.

In **Probing Reason, Evidence and Rationale**, the PM is asking for support to an argument or perspective. Here, rather than assuming that any statements are simply true, the PM asks how they know it to be true. “How is this statement supported?” and “how do we know this?” “Is there data and can you show me?” A statement can be poorly supported by semi-related facts or simply urban legend, which, if not uncovered, will undoubtedly lead your project down a poor direction.

By **Questioning Viewpoints and Perspectives**, the facilitator is looking to understand the position, and discover other, equally valid viewpoints. One may ask “How could you look at this another way...” or “What is the difference between... and...” as ways to expose the viewpoint or alternate views. Next steps beyond that may be to explore those viewpoints for validity and application to the project. Ask what perspectives make the most sense for what the team is trying to solve.

All actions have consequences, obvious or subtle. By **Probing Implications and Consequences**, we may be able to uncover or identify what has actually happened or what should occur. Asking “Then what would happen...” or “If so, wouldn’t we have seen...” are excellent ways to stretch the team’s thinking around the repercussions of an act or an event and may provide evidence which could lead to additional factors.

Questioning the question is a great way to put the focus back on the facilitator and help the team feel more comfortable with how the discussion is progressing. “What am I missing?” or “Am I making sense?” allows everyone the opportunity to push back and feel less interrogated and more engaged. Additionally, the team may offer up information that the PM may not even know, supporting that the line of questioning is in fact valid, or offering up even more alternatives. This reflexive approach will help ensure that the conversation is hitting all the right points and helping get to the core issues.

Socratic Questioning is an impactful way to get to the core truth of an issue or question. It can create clarity around team member input, and help make using the more common critical thinking or root cause tools more effective and less time consuming. These benefits make implementing critical thinking as a standard practice in your project management methodology extremely valuable.

However, as with any tool, Socratic Questioning needs to be used appropriately. It can be easy as a facilitator to focus too narrowly on the issue or statements that you are challenging and miss the human effect of the interaction. Many people, when challenged on their perspectives, take this as a personal attack (which is clearly not the intention). The most valuable exchanges of thought are done with your team members' reactions and emotions in mind. It's easy for a person to feel attacked in this type of discussion, so proceed with caution when challenging someone's viewpoints.

Another challenge with critical thinking is that it does not come naturally to everyone. Most PMs will need to be taught how to think critically and effectively facilitate this type of conversation. The best way to do so, like anything else, is through practice. Practice with the team in project meetings. If in every meeting, the team members know that they will be asked these types of questions, they will begin to prepare. They will ask themselves these same types of questions before the facilitator does, which in turn develops thoughtfulness in perspectives and non-bias opinions.

Other ways to learn critical thinking skills is to practice through play with the team – logical thinking puzzles or Twenty Questions are great team builders and help sharpen the skills it takes to think laterally. Examples of these logical thinking puzzles can be found on the internet or in books. Also, learn to practice in everyday life, asking how people do the simple things that are done in their regular routines, in what order and why. Why is it done that way and what could make more sense? Opportunities to think and learn can be found in surprising places.

Of course, critical thinking in and of itself will not resolve your project issues. As a PM, the next step is to apply the appropriate project discipline to collect data, identify the most impactful action items, assign owners, set a timeline and manage progress and status. Critical thinking will only get you to that point faster and more effectively.

Developing and practicing critical thinking is an effective way to help you understand the full scope of an issue, drive out solutions faster and more effectively and make the most of the tools available to tackle the big issues. This practice of asking and answering will help Project Managers add value as a leader and a facilitator, and may even be able to help the project stay on track. These are valuable skills that will help not only in managing projects, but any facet of a career.

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Ideas for this article are based on "*The taxonomy of Socratic questions*" created by Richard Paul, author of *Critical Thinking: How to Prepare Students for a Rapidly Changing World*.

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