

Part 1

Data Gathering

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1.0 DATA GATHERING TECHNIQUES

Data gathering is often the first technique we employ in a process. Before we can transform process inputs into outputs we often need to gather additional information. In this context, an input is any document, information, or other item that is needed to conduct a process. An output is any document, information, product, or other item that is the result of a process.

Some of the data gathering techniques entail collecting data from individuals or groups, such as focus groups and brainstorming. Some techniques entail collecting information by using tools such as checklists and check sheets. Benchmarking and statistical sampling collect data from procedures that have been performed many, many times by multiple people or even machines.

The techniques described in this section include:

- Benchmarking
- Brainstorming
- Check sheets
- Checklists
- Focus groups
- Statistical sampling

There are other data gathering techniques that are not described in this book because they are either not project specific, or they are in common use. For example, interviewing people, reviewing lessons learned and information from previous projects, and developing questionnaires and surveys are common techniques that are not applied in projects any differently than they would be in any other field. They are common enough that they don't require further explanation or examples to clarify how they are employed.

As with all techniques, you can use multiple methods to gather data. Use the methods that are easiest to gather the most complete and accurate information you need for your project.

1.1 BENCHMARKING

WHAT IT IS

Benchmarking is gathering data on the best in class, best in industry, or best in organization practices, processes, and products. The information is used as a target to improve processes, products, and results. Benchmarking is most often used in projects to collect requirements, establish quality metrics, establish cost and schedule targets, and establish stakeholder (especially customer) satisfaction targets.

HOW TO USE IT

Use the steps below as a guideline. Tailor the steps as necessary to work within your environment.

1. Identify the process or metric that you want to improve. If you are developing a new product or improving an existing one, identify the aspect of the product you are gathering data about.
2. If you are using benchmarks for improving performance, take a baseline measurement of your current performance.
3. Identify areas in your own company, leaders in the industry, or leaders in other industries with similar processes. These are your “targets” to measure against. You may need to talk with industry peers, consultants, vendors, associations, or other resources to help you discover the industry leaders (targets).
4. Depending on who and where your target is, and what you are benchmarking, you may be able to easily identify the best practices, such as when you are using a target that is internal to your organization. If the target is external, or even a competitor, you may need to gather business intelligence, work with a consultant, or find some other way to determine how they achieve their performance.

This is where the data gathering aspect of benchmarking stops. If you are working on a process improvement project that is built around achieving the benchmarks, you would develop a plan to implement a process that would help you reach the benchmark. If you are using the information for collecting requirements, the benchmark will provide information that will be prioritized along with other requirements.

Throughout the project, you can track how you are doing against the benchmark, especially if it is an easily measurable metric, such as cost per unit, time to produce, or quality defects.

4 1.1 Benchmarking

Scenario: Your project is to help improve customer satisfaction with the phone support from the IT Help Desk.

You start your project by looking at the data from the satisfaction survey. You notice that the IT area with the lowest scores is the Help Desk, specifically anything to do with calling the Help Desk.

Employee Satisfaction Survey

Please rate your degree of satisfaction on a scale of 1 to 5. 1 = very dissatisfied and 5 = very satisfied.

Information Technology

Help Desk

5	4	3	2	1
How satisfied are you with the quality of service from the Help Desk?				
0.15	0.3	0.4	0.1	0.05
How satisfied were you with the hold time when you called the Help Desk?				
0.05	0.1	0.3	0.4	0.15
How satisfied were you with the ability of the person to resolve your issue?				
0.62	0.2	0.1	0.08	0
How satisfied were you with the timeliness of the issue resolution?				
0.5	0.25	0.15	0.1	0
Do you feel the person on the phone understood your issue?				
0.65	0.2	0.1	0.05	0
Did the person on the phone listen to you?				
0.45	0.25	0.15	0.1	0.05
Could you understand what the person was saying?				
0.55	0.2	0.2	0.05	0
If you left a message, was the return call timely?				
0.25	0.25	0.35	0.1	0.05

Security

Hotline

5	4	3	2	1
How satisfied are you with the quality of service from the hotline?				
0.82	0.15	0.03	0	0
How satisfied were you with the hold time when you called the hotline?				
0.75	0.15	0.1		
How satisfied were you with the ability of the person to resolve your issue?				
0.8	0.15	0.05	0	0
How satisfied were you with the timeliness of the issue resolution?				
0.87	0.1	0.03	0	0

Do you feel the person on the phone understood your issue?				
0.8	0.1	0.1	0	0
Did the person on the phone listen to you?				
0.85	0.05	0.05	0.05	
Could you understand what the person was saying?				
0.8	0.1	0.1	0	0
If you left a message, was the return call timely?				
0.9	0.05	0.05	0	0

The satisfaction data shows only 62 percent of the people rate their experience in calling the Help Desk as a 4 or 5 on a scale of 1 to 5. You notice the security department has the highest satisfaction: 93 percent rate their experience as a 4 or 5 when calling the security hotline. You decide to use the security hotline as the benchmark for helping to improve the IT Help Desk practices.

Additional Information

This technique is often used with focus groups (Section 1.5), market research, academic research, surveys, and questionnaires.

PMBOK® Guide – Sixth Edition References

- 5.2 Collect Requirements
- 8.1 Plan Quality Management
- 13.2 Plan Stakeholder Management

1.2 BRAINSTORMING

WHAT IT IS

Brainstorming is used as a technique for generating ideas and options and solving problems. It is generally a group activity that has a facilitator to manage the process. Brainstorming focuses on generating quantity, with the assumption that having a good quantity of ideas will lead to having a good-quality outcome. In the brainstorming session there is no criticism, all ideas are equal, and all are welcome, including those that seem like they are wild ideas. Various techniques can then be used to evaluate ideas gathered in order to help identify viable alternatives. Often during the process ideas will build on each other and the synergy of the group will produce better results than one person, alone, could come up with.

HOW TO USE IT

Use the steps below as a guideline. Tailor the steps as necessary to work within your environment or to work with the brainstorming variation you choose.

1. Identify the problem, goal, or outcome for the brainstorming session.
2. All members of the group state their ideas.
3. Record all ideas.

If time allows, the ideas can be elaborated, analyzed, or prioritized.

Scenario: You are managing a project to develop a new company intranet site.

As the project manager you want to get some ideas for content, design, and requirements. You bring in people from various departments to help brainstorm some ideas that you will later prioritize and send out for the rest of the organization to comment on.

You decide to use some variations on the traditional brainstorming technique by using a group passing technique, some electronic brainstorming, and individual brainstorming.

Group passing technique. To gather high-level requirements, you give each person a category of requirements to work on. You ask each person to write down his or her requirements

and then pass it to the next person, who adds his or her requirements. This continues until everyone has commented on each category.

Individual brainstorming. Rather than being done in a group, individual brainstorming is done as an individual. This can take the form of free-writing, free-speaking, or drawing a mind map (Section 3.6). You ask your brainstorming group to come up with some ideas for the design and graphical user interface (GUI) for the website. You tell them they can use free-writing, picture creation, mind mapping, or any other form of communication for their ideas.

Electronic brainstorming. In this brainstorming technique you ask the group to contribute in an online environment. You post the content topic in an online bulletin board or chat room and people respond. Electronic brainstorming can permit a large number of ideas to be gathered very quickly because there is no turn-taking. People can respond as soon as they see other ideas, and the energy can build on itself. Electronic brainstorming has been found to generate more ideas and be of greater quality than in-person brainstorming. However, it requires a moderator to ensure anonymity does not lead to disrespectful interactions. Electronic brainstorming can also take place over a longer period of time, allowing for more reflection. You choose how long to allow the bulletin board to be posted, allowing people to log in and contribute as they are able.

Additional Information

Brainstorming can be used with focus groups (Section 1.5). Combining brainstorming with the nominal group technique (Section 5.3) allows the ideas to be prioritized for further elaboration or to reach a decision.

PMBOK® Guide – Sixth Edition References

- 4.1 Develop Project Charter
- 4.2 Develop Project Management Plan
- 5.2 Collect Requirements
- 8.1 Plan Quality Management
- 11.2 Identify Risks
- 13.1 Identify Stakeholders

1.3 CHECK SHEETS

WHAT IT IS

A check sheet is a tally sheet that is used to collect data. It can be used to collect data about defects or to keep track of completing steps in a process.

HOW TO USE IT

Use the steps below as a guideline. Tailor the steps as necessary to work within your environment.

1. Identify the types of defects (or other variables) you are looking to tally and enter these in Column 1 of a spreadsheet. You would start this in cell A2 and continue with A3, A4, and so on.
2. The top row can indicate either frequency (enter "Frequency" in cell B1) or, if you are tracking locations or days of the week, hours of the day, or some other variable, enter each of these in the top row starting with cell B2. Follow with B3, B4, and so on.
3. Observe the process, outputs, or deliverables.
4. Indicate the source of the defect and put a mark in the appropriate cell.
5. Tally the rows and columns.

Scenario: Your project is to help improve customer satisfaction with the phone support from the IT Help Desk.

To understand the reason behind the IT Help Desk complaints you create a check sheet to tally the number of complaints, by reason and by department. The number of complaints by reason are totaled, as are the number of complaints by department.

	IT Help Desk	Security Hotline	Legal Info Line	Maintenance Trouble Line	Total
Call was dropped		I	III	0	11
Tech did not listen to me		0		II	11

	IT Help Desk	Security Hotline	Legal Info Line	Maintenance Trouble Line	Total
On hold too long					39
Couldn't understand technician					15
Could not help with my issue					24
Did not return my call in a timely manner		0			20
Total	62	9	28	21	120

Additional Information

Check sheets can be used to show the distribution of defects, and can then be arranged in a histogram (Section 3.4) or Pareto chart showing the frequency of defects by cause, location, or other variable.

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8.3 Control Quality

1.4 CHECKLISTS

WHAT IT IS

A checklist is a list of activities, steps, or procedures that need to be done. It is often used as a reminder.

HOW TO USE IT

In projects, checklists are used to reduce or eliminate risks or defects. They contain a series of steps that must be taken, or processes that must be completed.

Scenario: You are managing a project to develop a new company intranet site.

This example shows some of the items that must be completed in updating an intranet website. This is only an example; all checklists should be tailored to your specific environment.

- ☒ Collect stakeholder requirements
- ☒ Map inbound links
- ☒ Create new content as necessary
- ☒ Upload content to new site
- ☒ Develop tags and metadata
- ☒ Check all links
- ☒ Create XML/HTML sitemaps
- ☒ Test speed
- ☒ Check for mobile access
- ☒ User acceptance testing

Additional Information

A few of the downfalls associated with using checklists are:

- People can rely on the checklist and fail to look outside the items on the checklist for other risks or causes of failure. Use the checklist as a starting place, not an ending place.
- Over-reliance on checklists can replace common sense or critical thinking. A checklist can act as a prompt, but should not take the place of looking at a situation and taking appropriate actions.

Therefore, checklists should only be used as a starting point in many project situations. Team members should continue to identify sources of risks and defects.

PMBOK® Guide – Sixth Edition References

- 4.2 Develop Project Management Plan
- 8.2 Manage Quality
- 8.3 Control Quality
- 11.2 Identify Risks

1.5 FOCUS GROUPS

WHAT IT IS

A focus group is a group of prequalified people who are brought together to provide information about a product, service, or result. A professional moderator uses a question guide to focus the direction of the questions. The moderator also observes behaviors and nonverbal cues and records them in her observations.

HOW TO USE IT

Focus groups are most commonly used for new product or new service development. They may be part of a market research campaign to gather requirements or to provide insight into customer opinions, expectations, desired benefits, underlying assumptions, common views, and so forth.

1. Establish your goals or desired outcomes for the focus group.
2. Develop a discussion guide that provides a focus for the group, but also allows some open conversations that are not driven by the moderator.
3. Find a qualified moderator. You may want to hire a professional moderator to lead the group. Your moderator should have at least these qualifications:
 - a. The ability to be friendly, nonjudgmental, flexible, and open. He or she needs to stay on topic, ask open-ended questions, and manage the conversation so it is productive and not combative.
 - b. He or she should have some understanding of the new product or service, but not have a vested interest in the outcomes.
4. Determine how to record the session, either with video, audio, or a note-taker.
5. Set up the meeting logistics such as time, location, date, and duration.
6. Identify and invite the participants. Ideally you want a cross section of potential end users and customers.
7. At the opening of the meeting:
 - a. Thank participants for attending.
 - b. Review the purpose of the meeting.
 - c. Review the flow of the meeting, guidelines, ground rules for participation, and so forth.

8. During the meeting:
 - a. Ask open-ended questions to start a topic; use closed-ended questions to gain clarity.
 - b. Make sure everyone is participating. You may need to call on some people to get their feedback.
 - c. Summarize information, rephrase questions if necessary, employ active listening, and ask for comments about responses.
 - d. Ask if there are any other comments or thoughts before moving on, and before wrapping up the meeting.
 - e. Thank the participants for coming.
9. Assess the data and look for patterns, themes, unexpected outcomes, and new questions that may have arisen.

Scenario: You are the project manager for a project to implement a childcare facility for your organization's employees.

The Project Charter has been developed. You are meeting with 12 parents at your organization who currently use childcare facilities. They work in different departments, have children from three months old to four years old, and hold a variety of jobs.

You want to use the focus group to understand the expectations and attitudes about the curriculum, play time activities, and food. You decide to be the note-taker and you have asked Roberta, the Director of Human Resources, to facilitate the session. Roberta doesn't have a personal relationship with any of the participants and she is skilled in listening, drawing people out, and creating a nonjudgmental environment.

You set up the meeting for lunch time two weeks in the future. You will provide pizza and soda for the participants. Roberta opens the meeting with general questions about what people are looking for in a childcare facility. From there she asks questions about the ratio of skill development versus playtime, the types of indoor and outdoor play time equipment the parents would like to see, and their thoughts on snacks and lunches.

As the meeting closes the parents are excited about the new childcare center and make themselves available for any future questions. The information you gained will help you put together an RFP for playground equipment and food vendors. You will provide the information on the curriculum and skill development to the director of the childcare center to help him develop the roadmap for learning.

Additional Information

Some focus groups offer incentives, including cash for participation.

Focus groups generally provide broad qualitative information. The interactions and body language provide a deeper understanding of people's opinions than questionnaires. The qualitative information can then be analyzed and can be followed up with questionnaires and surveys to get quantitative data by asking ranking questions or closed-ended questions.

PMBOK® Guide – Sixth Edition References

- 4.1 Develop Project Charter
- 4.2 Develop Project Management Plan
- 5.2 Collect Requirements

1.6 STATISTICAL SAMPLING

WHAT IT IS

Statistical sampling is selecting a subset of a population to estimate characteristics and information about the whole population. Selecting a subset is a more time- and cost-efficient way to reach conclusions about a group instead of asking each member of the group, or testing every physical component.

HOW TO USE IT

Statistical sampling can be used to infer behavior of a group of people, or to infer the quality of a set of deliverables or components.

1. Identify the population of interest.
2. Identify the variables you want to measure.
3. Select the sample size and method for selecting the sample population.
4. Implement the sampling plan.
5. Measure the variables from the sample.

The most effective ways to select your sample are to choose a random sample, or a systematic sample (such as every 15th person).

Scenario: You have been asked to meet the physical growth needs of Top Dog Project Services.

One of the options you are reviewing to meet the growth needs of all the offices is to develop a work-from-home program. Before establishing the requirements and policies for the program you want to get an idea of how many people work from home after hours or on weekends. You also want to see, on average, how many hours people are active on their computer during the workday. You think it would be useful to have this information broken out by department.

First you identify the locations that have employees that will be eligible to work from home. You identify four locations that have employees who would be eligible for the program. You determine that the total number of employees who would be eligible to work from home is

250 people. That is your population of interest. You decide that you need at least three people from each department as a minimum. For departments with more than 30 people, you decide to identify one person for every ten people in the department.

You meet with the Corporate Director of Information Services and tell him your sampling parameters. He agrees that these are reasonable measures and confirms that he can provide the information anonymously so that no one's personal work habits are identifiable. He runs the sample for four weeks to get an idea of activity over time.

Additional Information

When you are selecting your sample, try to ensure you don't have over-coverage or under-coverage of a particular trait or bias in your sample.

There is a wide body of information on selecting sample sizes for statistical sampling. For the most part, in project management we don't have to be extremely precise. We mostly use the information to give us a general idea of a population's characteristics. For projects that require Six Sigma-type measurements, you will need to be a lot more precise in selecting the sample and defining the variables you want to measure.

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8.3 Control Quality

