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Root Cause Analysis

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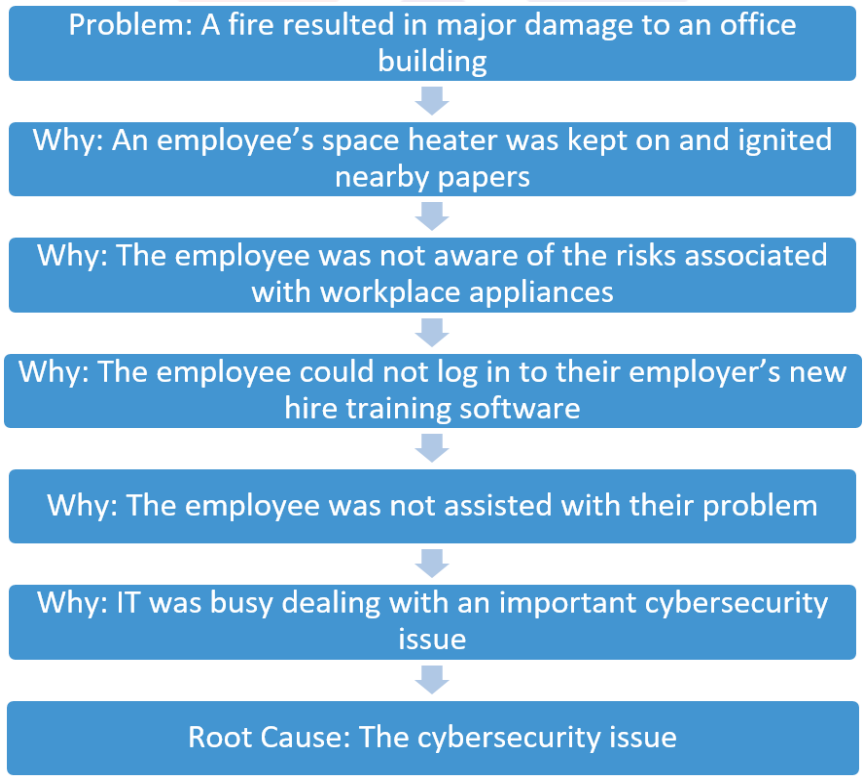
Every agency has its fair share of problems, ranging from safety in the workplace to unexpected costs relating to seemingly random accidents. All too often these problems are addressed momentarily and given little of the proper attention, leading to the same issues arising again in the future. This can especially be the case when too much focus is given to alleviating the symptoms of the problem rather than investigating its root causes. Doing a deep dive into the origins of an issue can be a better way to prevent it in the future, and this principle is the driving force behind root cause analysis.

Root cause analysis is the practice of investigating problems well past the surface level, getting into the nitty gritty of cause and effect in determining how to best address a problem at its absolute source. A simple example is finding out the original cause for a fire in an office building, as demonstrated in this diagram to the right:



By asking these five questions the problem in the department suddenly became much simpler, with the issue arising from another seemingly unrelated problem rather than an issue with the entire department, as problems like these appear to be on the surface.

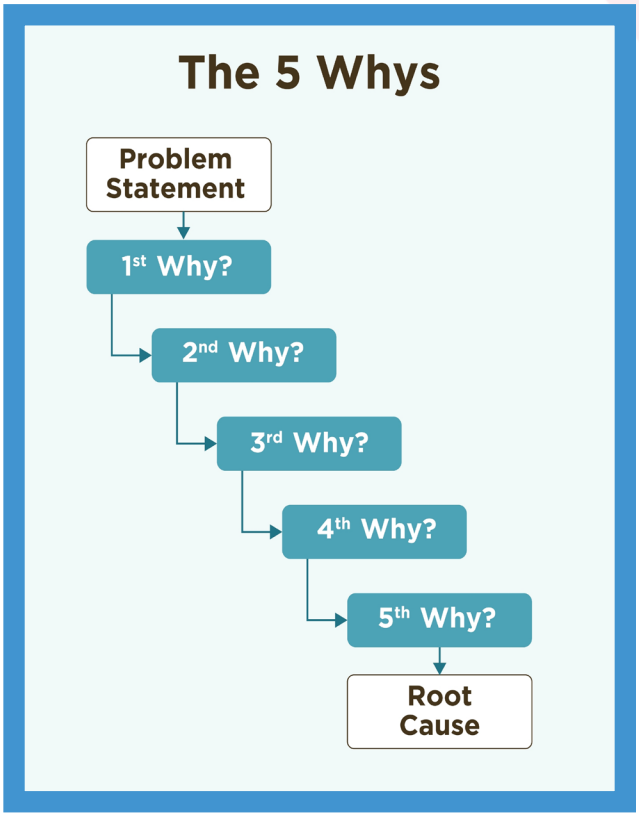
The example above demonstrates the usefulness of practicing root cause analysis, because it only took a simple reflection into the reasons behind a problem to uncover what ended up leading to the issue. Addressing problems in this manner can prevent confusion about who or what is responsible for the problem, and can more effectively prevent the same or similar problems from happening in the future.

Here are some important principles to keep in mind when conducting root cause analysis:

- The purpose of root cause analysis is to prevent problems from happening in the future
- There may be more than one root cause for a problem
- Multiple perspectives are helpful for investigating the causes of a problem
- Focus only on controllable factors
- Root cause analysis can also be used to analyze successes
- Problem causes should ideally be supported with evidence
- Avoid confusing correlation with causation

Methods

Root cause analysis is fairly simple in principle, but certain frameworks for mapping and organizing thoughts can be useful to have for more complex issues.



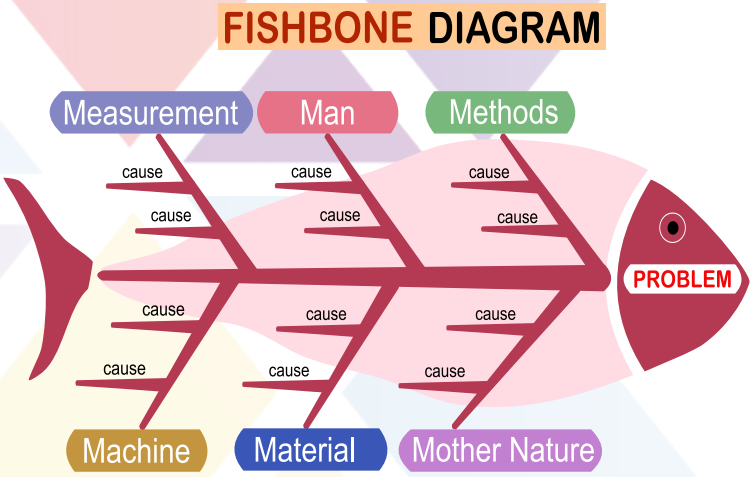
The Five Whys Method

This method was demonstrated in the first example for root cause analysis given above. It involves identifying a problem and asking why the causes of it occurred for a total of five times. This technique is an easy way to dig deep into the root causes behind a problem, and isn't necessarily limited to just five questions. Some complex problems could have even more causes, and one could keep asking why and keep getting more answers much more than five times. This procedure serves as a good starting off point for getting to the bottom of an issue.

Fishbone Diagrams

Another method for conducting root cause analysis is by using Fishbone Diagrams, also known as Ishikawa Diagrams named after their creator. These diagrams are similar to the Five Whys method but with multiple lines of causes and effects coming together to explain a single problem. Here are the steps for creating a Fishbone Diagram:

1. Draw a horizontal line and write the problem being analyzed at the end of it on the right. This is the fish's spine and head
2. Come up with categories to describe the problem's causes, or use Ishikawa's "6 M's" which are the categories listed below:
   - Materials: parts and general supplies
   - Machinery: physical equipment and software
   - Methods: rules, customs, and procedures
   - Manpower: employees
   - Measurement: data recording, measuring devices
   - Mother Nature: environmental events
3. Draw a line for each category connected to the horizontal line representing the fish's spine. These are the fish's ribs.
4. For each category, list the reasons for the problem as they pertain to the category. Keep listing reasons in a similar manner to the Five Whys method, coming up with lines of causes and effects wherever relevant.



A complete Fishbone Diagram offers a more comprehensive look into the many potential causes behind a particular problem, providing a framework to identify and work on alleviating root causes without having too narrow of a perspective on what and where a problem stems from.

Conclusion

Root cause analysis can be an effective way to solve problems with a holistic mindset, analyzing cause and effect to understand the roots of any issue that needs solving. Following the correct procedures while conducting this analysis can help to avoid coming to incorrect or biased conclusions, which may end up doing more harm than good. Brainstorming techniques such as the Five Whys Method and Fishbone Diagrams can be useful tools in this regard, providing an easy to understand framework for performing the analysis. Lastly, it's important to conduct the analysis in the right mindset, focusing not only on the causes of the problem itself but also on how to prevent the same problems in the future.

For any additional questions on root cause analysis, contact PRISM's Risk Control Department.