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INSIGHT ARCHITECTS

ISHIKAWA DIAGRAM

An Analytical Tool for Business Analysts.

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# INTRODUCTION

Every organisation in its life cycle encounters a problem where a feasible solution will be required. Before reaching the solution, a thorough analysis of the problem needs to be performed to find its cause. An organisation must use certain strategies or tools to perform this analysis. One of the best strategies that can be employed is the Root-Cause Analysis adopting the Fishbone Diagram, alias Cause-and-Effect Diagram or Ishikawa diagram.

In this report, the examination of the Fishbone Diagram as a Root-Cause analysis tool for organisations will be conducted. It will start by introducing the diagram and elaborating on its significance and application. It will then explore its advantages and disadvantages before concluding on its implications.

As mentioned above, the Fishbone Diagram is a tool under the Root-Cause Analysis. Andersen and Fagerhaug (2006) described the root cause analysis as “a structured investigation that aims to identify the true cause of a problem and the actions necessary to eliminate it” (p. 12).

de Seager (2015) defined the fishbone diagram as “a graphical tool used by companies, which offers a global vision of the generating causes of a problem and the resulting effects” (p. 6).  After understanding what the fishbone diagram is, it is important to highlight that this report chose to focus on this tool for its ability to visualise the process of understanding the origin of the problem. It also looks at different areas to find where the problem truly comes from.

Now that we know what the Ishikawa diagram is and what it entails, it is important to understand its importance and how it is applied.

# IMPORTANCE

In business analysis, the fishbone diagram plays an important role. According to Rodriguez (2020), It helps pinpoint the root cause of the issue and fosters empathy among team members. When addressing a critical problem, the fishbone model is employed to avoid spending excessive time on minor elements or features during problem-solving and decision-making processes.

According to Rodriguez (2020), these are important key aspects of the Fishbone diagram:

* The Fishbone diagram is a perfect technique to tackle challenging problems where multiple variables need to be weighed.
* By using the Fishbone diagram the potential triggers of a given issue can be displayed in a quick, easy to-read graphical manner.
* It stimulates a detailed review and assessment, and it helps you to investigate in depth the potential causes.
* Stimulates in-depth discussion of this issue by team members.
* It helps to provide a more detailed explanation and a better image of the problem.
* Support team focus through effective communication and strategic task management.
* It’s a very useful tool for issue identification and resolution processes through thorough analysis and decisive problem-solving.

When an organisation chooses the Ishikawa diagram as a strategic tool, it is important that they choose the right type to help solve their problem.

VanZandt (2023) mentions that there are four types of the Ishikawa diagram, and they are:

1. Simple Fishbone Diagram

It is made up of only two functional areas and the head. It is the simplest of all the fishbone diagram types.

1. 4S Fishbone Diagram

This type is prominently used in the industrial and manufacturing industries. The 4Ss in the diagram represent skills, surroundings, suppliers, and systems.

1. 8P Fishbone Diagram

The 8P is identified as an enterprise fishbone. It focuses on 8 attributes which are price, product, people, place, promotions, policies, procedures, and processes.

1. 6M Fishbone Diagram

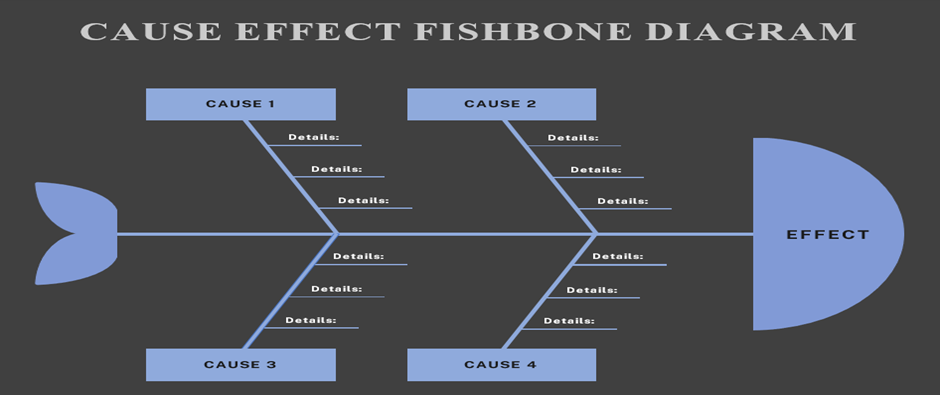
It is a standard that is set for manufacturing and is seldomly used outside its intended scope. It has six attributes which are man, machine, measurements, materials, method, and mother nature.

Now that the importance of the fishbone diagram has been highlighted, the next section will demonstrate the application of the tool.

# APPLICATION

Fishbone diagram (Ishikawa diagram) has various applications across different industries. It is used for identifying root causes and enables the implementation of specific corrective measures. Before the document focuses on how the fishbone is applied in different industries, let us firstly look at how it works.

As mentioned in the definition, it is graphically represented by a fishbone. The problem identified is represented by the head of the fishbone, while the key functional areas are placed at the end of the protruding fishbones. All suspected causes of the problem from each functional area are placed within the protruding fishbones.



Source: TemplateLab-<https://templatelab.com/fishbone-diagram-templates/>

Below are three examples of where the Fishbone diagram is mainly applied:

* Business Management
* Product development
* Quality Assurance/Improvement

|  |  |  |
| --- | --- | --- |
| Business Management | Product Development | Quality Assurance/Improvement programs |
| A use case of the fishbone diagram in Business Management is using it to try to understand why a product or service is not selling well. The fishbone diagram breaks down all plausible causes and helps in identifying possible solutions that will improve sales. (Longe, 2022) | The fishbone diagram can assist in developing a new product or service. It helps you think of all possible use cases and how each will be delivered. Considering all use cases for a new product/service is very essential to ensure that the needs of the target market are met and ensure that there is a constant demand. (Longe, 2022) | Fishbone diagrams can be used to identify the root causes associated with defects in products or services and implement possible solutions or changes. (Longe, 2022) |

Now that the Fishbone Diagram has been introduced and the overview of the root cause analysis has been outlined, let’s explore the advantages.

# ADVANTAGES

1. Simple Visualisation

 By arranging things in a visually appealing manner, a fishbone diagram is a completely visual tool that can assist you in identifying problems that you might not have thought of otherwise. This makes it simple to determine where the difficulties might be coming from. (Ionescu 2021).

1. Look for areas where you can improve.

 Because our processes are represented visually in a fishbone diagram, you may quickly ascertain which aspects of your setup need to be improved (Ionescu, 2021).

1. Boost Mutual Understanding.

Employing a fishbone diagram can help to make sure that everyone is in agreement and that both managers and staff have a clear understanding of their tasks (Ionescu, 2021).

1. Show the Relationship logically and with clarity.

 The connections and interactions between the possible causes and outcomes shown in the picture are captured by the fishbone diagram (Ionescu, 2021).

1. Historical Analysis

Fishbone diagrams can be used for historical analysis, which enables groups to examine previous occurrences or issues and spot recurring themes or core reasons. Putting long-term preventive actions into practice is made easier by this historical viewpoint (Coccia, 2020).

1. Data-Driven Decision Making

 By giving a visual depiction of data patterns and correlations alongside possible causes, fishbone diagrams, when paired with data analysis, facilitate data-driven decision making. Problem-solving attempts become more accurate and efficient as a result of this integration. (Villegas, 2019)

1. Cross-Functional Collaboration

By incorporating participants from several departments or disciplines in problem-solving exercises, fishbone diagrams foster cross-functional collaboration. Working together would enable different viewpoints to be taken into account, resulting in more comprehensive solutions that deal with different facets of the issue. (Shinde, Ahirrao, & Prasad, 2018)

1. Promotes Collaboration

Collaborating with stakeholders and team members guarantees that different points of view are considered, which results in more comprehensive approaches to problem-solving (Ayub et al., 2022).

As much as the use of this tool comes with various advantages, it comes with its own disadvantages.

# DISADVANTAGES

1. Subjective Bone Building

When investigators create a Fishbone Diagram to understand why something went wrong, most of the time they must guess the reasons, especially if they don't have training in human factors which is the science of understanding why people make mistakes. This process can be challenging because they are not guided by scientific knowledge of human errors. So, the bones of the diagram which represent the causes of the problem are based on their best guesses rather than solid facts according to (Paradies, 2020).

1. Neglecting "What Happened" Analysis

Before you use the Diagram to figure out why something went wrong, it's important firstly to understand what really happened. Which means you should know all the details about the problem before trying to find out why it happened. If you don't understand what happened, you might guess wrong about why the problem happened. So, it's more like making sure you know all the parts of a puzzle before you try to solve it according to (Paradies, 2020).

1. Limited Corrective Action Guidance

The Fishbone Diagram doesn’t tell investigators how to fix the problem, therefore, when people use it, they often just choose from a few common ways of fixing things, like teaching people better, changing how things are done, or punishing someone. But these might not be the best ways to fix the problem according to (Paradies, 2020).

1. Lacks Quantitative Analysis of Causes

This makes it unable to measure their impact precisely (BGMC, 2023).

1. Requires Time and Effort

It requires more time and effort, especially for complex problems with numerous factors and variables, which can lead to frustration (BGMC, 2023).

1. Focus on Single Effect

The diagram is designed to analyse a single effect with multiple potential causes. If you are dealing with a situation with multiple cascading effects, it might be necessary to create multiple Fishbone diagrams to fully understand the root causes (American Society for Quality, 2024).

# CONCLUSION

The major revelation from the fishbone diagram report is the profound insight it provides into the complex web of causality underlying organisational challenges. Despite facing criticisms such as subjective bone building and limited corrective action guidance, its strengths, including easy visualisation, cross-functional collaboration, and data-driven decision-making, highlight its important role across various sectors.

 By offering a structured approach to problem-solving, promoting thorough analysis, and fostering collaboration among stakeholders, the fishbone diagram emerges as a cornerstone for businesses striving for continuous improvement and sustainable growth. Additionally, the fishbone diagram empowers teams to shift from symptom-based to root cause analysis, promoting a culture of preventive problem-solving.

Its simplicity encourages widespread adoption, making it accessible even to teams without extensive technical expertise. Furthermore, the tool's versatility extends beyond operational challenges, proving invaluable in quality management, process optimization, and risk mitigation strategies. As organisations navigate increasingly complex landscapes, the fishbone diagram remains a good tool in untangling complex issues and driving impactful change. Adopting this methodology can facilitate innovation and resilience, driving businesses towards success in dynamic environments.

# REFERENCES

American Society for Quality. (2024). What Is a Fishbone diagram? Ishikawa Cause & Effect Diagram. Asq.org. https://asq.org/quality-resources/fishbone

Andersen, B., & Fagerhaug, T. (2006). Root cause analysis: Simplified tools and Techniques (2nd ed.). ASQ Quality Press.

Ayub, Z., Xu, X., Castro, V., Pirzada, K., Mendez, A., & Grageda, M. (2022). Promoting a Culture of Safety with Death Reviews and Resident-led RCA’s (Root Cause Analysis Conferences). Pediatrics, 149(1 Meeting Abstracts February 2022), 388-388.

BGMC. (2023). Fishbone Diagram, Types, Advantages, Drawbacks, and Six M’s. BGMC. https://bgmcgroup.com/exploring-the-fishbone-diagram-types-advantages-drawbacks-and-revealing-the-six-ms-of-change/

Coccia, M. (2020). Fishbone diagram for technological analysis and foresight. International Journal of Foresight and Innovation Policy, 14(2-4), 225-247.

de Saeger, A. (2015). The Ishikawa diagram: Material, method, machine, mother nature, measure, men (Vol. 5, Ser. Gestion & marketing). 50Minutes.

Ionescu, S. (2021). Benefits of using the fishbone diagram. 6sigma. https://6sigma.com/benefits-of-using-the-fishbone-diagram/

Longe, B. (2022). Fishbone Diagrams: Categories, Applications & Limitations. Formplus. Retrieved from https://www.formpl.us/blog/fishbone-diagrams

Paradies, M. (2020, October 7). Fishbone Diagram Root Cause Analysis - Pros & Cons. TapRooT® Root Cause Analysis. https://taproot.com/fishbone-diagram-root-cause-analysis-pros-cons/

Rodriguez, D. (2020). Importance of Cause and Effect Diagram (a.k.a Fishbone Diagram). Invensis Learning Blog. Retrieved from https://www.invensislearning.com/blog/cause-and-effect-diagram

Shinde, D. D., Ahirrao, S., & Prasad, R. (2018). Fishbone diagram: application to identify the root causes of student–staff problems in technical education. Wireless personal communications, 100, 653-664.

VanZandt, P. (2023, December 22). What is a fishbone diagram? definition, categories, examples, and best practices. IdeaScale. https://ideascale.com/blog/what-is-a-fishbone-diagram/#toc\_Top\_5\_Best\_Practices\_for\_a\_Fishbone\_Diagram

Villegas, J. A. (2019). Adoption of a data-driven decision making approach to implement and sustain a continuous improvement culture in the food industry [Doctoral dissertation, California State University, Dominguez Hills]