The 5S-KAIZEN-TQM approach training materials

What is KAIZEN with QC story?

Japan International Cooperation Agency

Fujita Planning Co., Ltd.

Objectives

At the end of the lecture, the participants will be able

- To understand the overall concept of KAIZEN QC story
- To explain about type and its purpose of QC story
- To explain about QC story and QC tools
- To explain about basic and new seven QC tools

What is Quality Control (QC) story?

- The QC Story is a tool for analyzing and solving problems—an essential task in quality management for organizations.
- The methodology was developed in Japan to improve engineering processes and to standardize documentation and record-keeping across all stages of work.
- It was later introduced into the service industry in the early 2000s.
- This method of problem analysis is a management tool designed to identify the root causes of issues and to propose effective, lasting solutions, thereby maximizing results

Source: https://www.sydle.com/blog/qc-story-62bc6a26bc6a6423db428948#

Principles of KAIZEN with QC story

KAIZEN with QC Story is a continuous improvement process based on the following principles:

- The target of KAIZEN is your own work—not someone else's.
- Good processes produce good results.
- Go and see for yourself to understand the current situation.
- Speak with data; manage by facts.
- Take action to contain and correct the root causes of problems.
- Work as a team.
- KAIZEN is everyone's responsibility.

https://in-hubspot.kaizen.com/difference-between-kaizen-lean-and-six-sigma

What are the benefits of QC story? (1)

- The QC Story presents an overall picture of the KAIZEN process, making it possible to track the progress of KAIZEN activities and easily identify what needs to be done—or what is missing—to move on to the next step.
- The principle of KAIZEN is teamwork. To effectively divide roles among team members and understand each other's responsibilities, the QC Story helps visualize the problem-solving steps, making information easier to share. In addition, the QC Story includes an action plan, enabling team members to share and monitor progress collaboratively

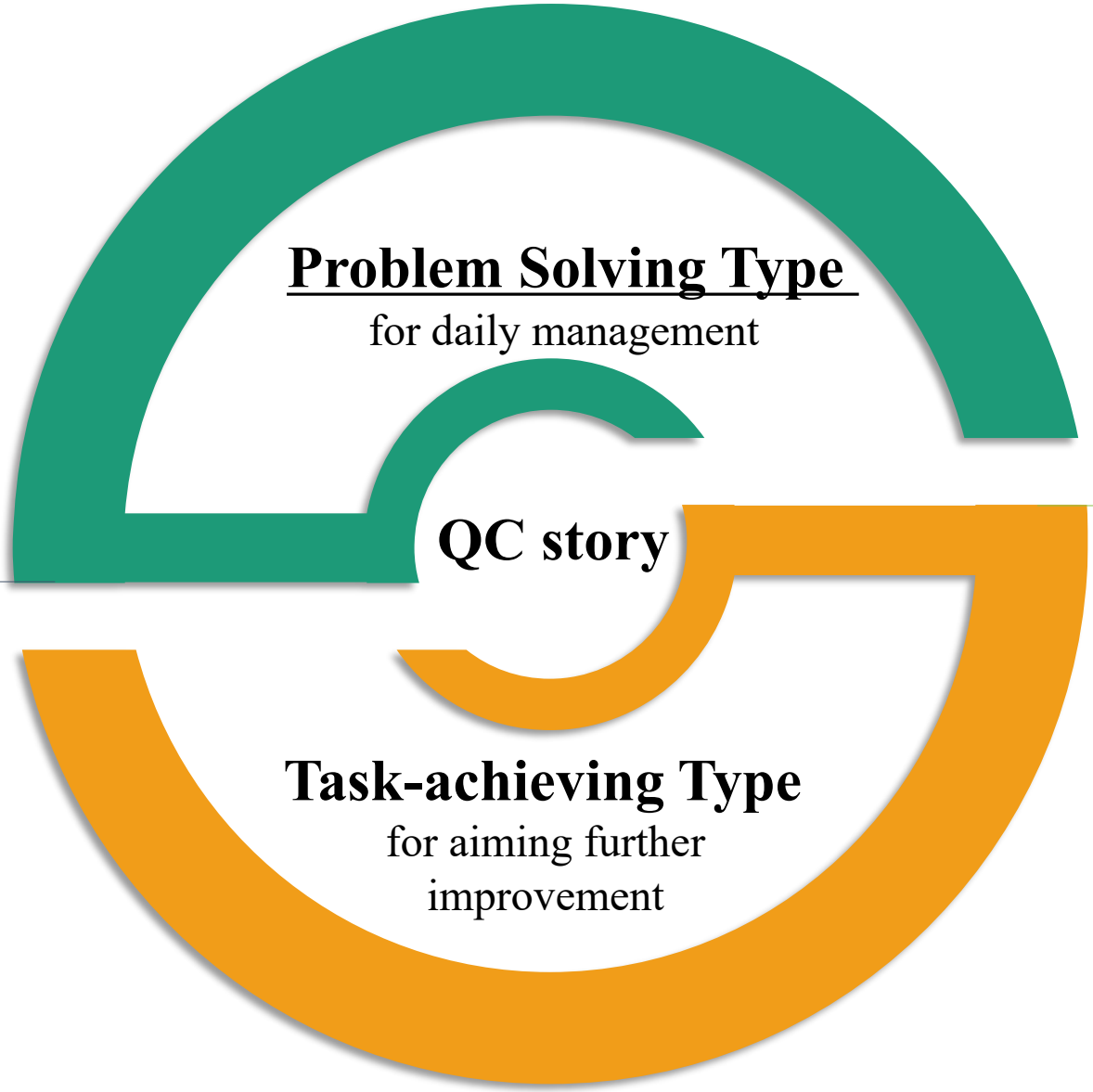
What are the benefits of QC story? (2)

The **QC Story** can be an important tool for quality management and maintenance in your organization.
The benefits of applying the QC Story include:

- Mitigation of failures that compromise business productivity
- Improved compliance with organizational processes
- More confident and evidence-based decision-makinReduction of waste
- More efficient use of resources
- More accurate information to better accomplish tasks

Two types of QC story

- To reduce/solve problem and make the situation closer to setting standards (what and how it should be)
- It is often applied on the on-going activities



- To make an effort for achieving task or challenge and closer to the ideal situation
- It is often applied on the newly starting activities

Purpose is different …..

	Problem solving type	Task-achieving type
Activity policy	Everyone participates in identifying problems and taking action	Define the ideal situation and take action to achieve improvements through the task team.
Basic concept	• Try to eliminate difficulties and reveal problems in the workplace • Continue many small improvements and accumulate results	• Make improvements and directly link to management of organization. • Break down what need to be done to reach the set goal.
Human resource development / workplace culture	• Get into the habit of being aware of problems every day and raise your mindset for improvement. • Have a sense of ownership. • Improve workplace communication and create a culture where you can consult anything	• Improve the ability to grasp the facts concretely. • Dig into the cause and improve the ability to think analytically based on the principle. • Creating ideas that go beyond existing ideas

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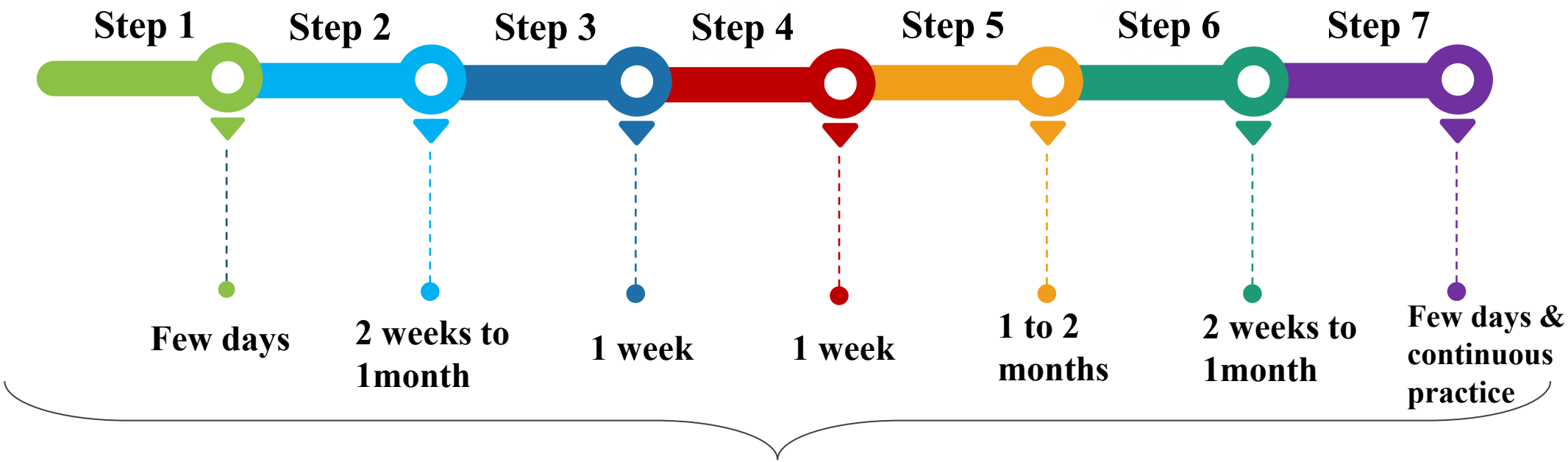
Comparison between two types of QC story

Problem solving type QC story	Steps	Task-achieving type QC story
Theme selection	1	Theme selection
Situation analysis • Identification of contributing factors and its prioritization, • Target setting for Quality Characteristic Value (QCV)	2	Clarification of task/challenge • Target setting
Root cause analysis	3	Development of possible solutions
Development of countermeasures	4	Pursuit of success scenario
Implementation of countermeasures	5	implement the success scenario
Measure effectiveness	6	Measure effectiveness
Standardization	7	Standardization

Time allocation of each step in QC story for problem solving



Appropriate time allocation for whole process of QC story is within **6 months**

Why you need to go through all the steps?

The QC Story uses evidence-based problem solving, helping prevent problems from recurring when applied correctly.

Linkage between QM plan and QC story

- The QC Story is a tool used within the framework of a QM plan to solve specific problems in a structured, data-driven manner. It brings the QM plan to life by translating strategic goals into measurable and actionable improvements.
- The QC Story is one of the tools or methods used to implement and achieve the objectives set in the QM plan.
- Problems outlined in the QI plan are investigated and resolved through KAIZEN using the QC Story.
- Implementing QC Stories helps operationalize the QM plan and build internal capacity for continuous improvement.

Each step of QC story need to use one or two QC tool(s)

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QC story and QC tools

- The QC Story is a method used to illustrate the quality control process and is designed for systematic and lasting problem-solving.
- QC tools are essential for progressing through the QC Story, as they provide supporting evidence at each step.

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Two groups of QC tools

Basic seven QC tools are used for **Quantitative data** analysis

- They are basic statistical approaches to analyze information correctly
- They are also useful for evidence-based management of work

New seven QC tools are used for **Qualitative (verbal) data** analysis

- Verbal data can be organized and reveal problems
- They are useful for organizing complicated and intertwined problems
- Narrow down problems and make planning easier

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QC tools

Basic Seven QC tools

- Pareto Chart
- Histogram
- Stratification
- Scatter Diagram
- Cause-and-Effect Diagram
- Check Sheet
- Control Chart

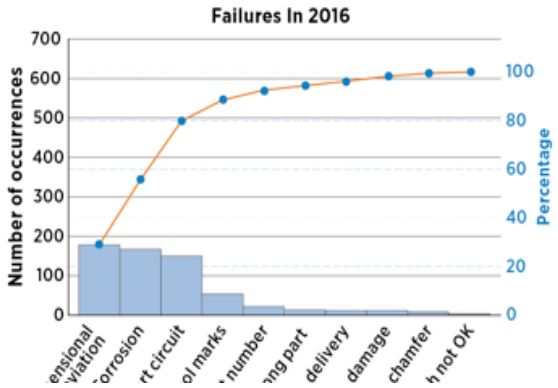
New seven QC tools

- Affinity Diagram
- Relation Diagram
- Tree Diagram
- Matrix Diagram
- Arrow Diagram
- Process Decision Program Chart (PDPC)
- Matrix Data Analysis

- When implementing KAIZEN using the QC Story approach, it is not necessary to use all QC tools. The choice of which QC tools to use depends on the specific problem being addressed (KAIZEN Theme) and the data and information related to that problem

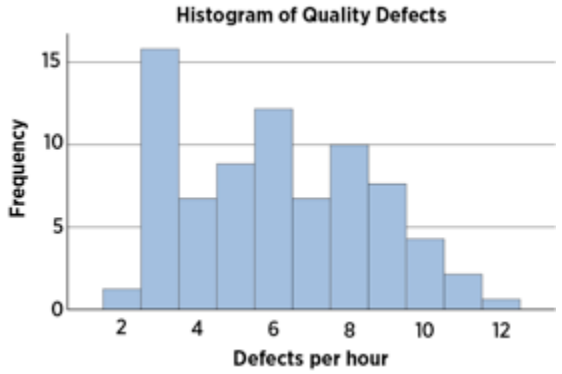
Basic seven QC tools (1)

Pareto Chart



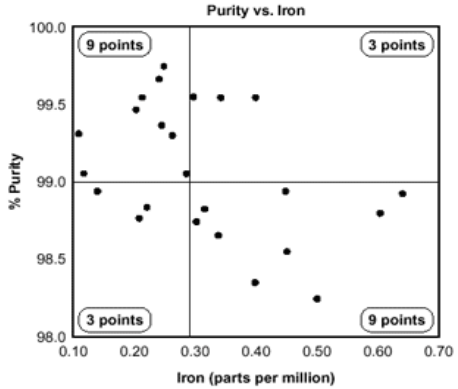
Pareto charts are extremely useful for analyzing what problems need attention first.
It is a type of chart that contains both bars and a line graph, where individual values are represented in descending order by bars, and the cumulative total is represented by the line. This tool is often utilized for QC story step 2 and 6.

Histogram



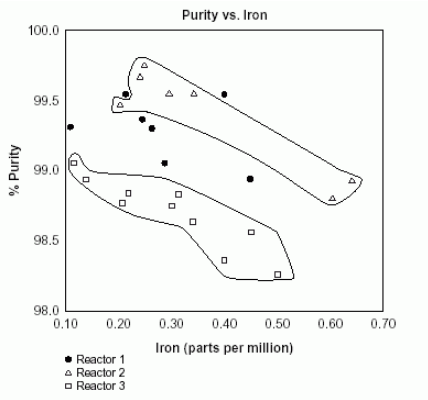
A frequency distribution shows how often each different value in a set of data occurs. A histogram is the most commonly used graph to show frequency distributions. This tool is often utilized for QC story step 2.

Scatter Diagram



The scatter diagram graphs pairs of numerical data, with one variable on each axis, to look for a relationship between them. If the variables are correlated, the points will fall along a line or curve. The better the correlation, the tighter the points will hug the line. This tool is often utilized for QC story step 6.

Stratification



Stratification is defined as the act of sorting data, people, and objects into distinct groups or layers. It is a technique used in combination with other data analysis tools. When data from a variety of sources or categories have been lumped together, the meaning of the data can be difficult to see. This tool is often utilized for QC story step 6.

Source; https://asq.org/quality-resources

Basic seven QC tools (2)

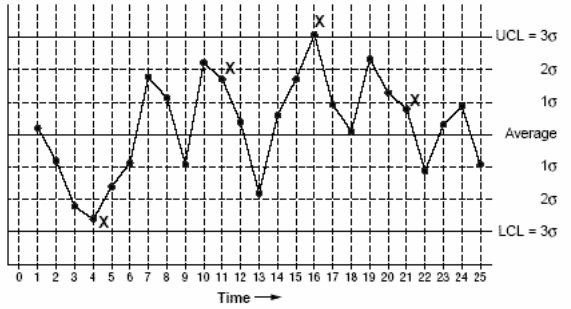
Check Sheet

Telephone Interruptions

Reason	Day					
	Mon	Tues	Wed	Thurs	Fri	Total
Wrong number	𝍸	||	|	𝍸	𝍸 ||	20
Info request	||	||	||	||	||	10
Boss	𝍸	||	𝍸 ||	|	||||	19
Total	12	6	10	8	13	49

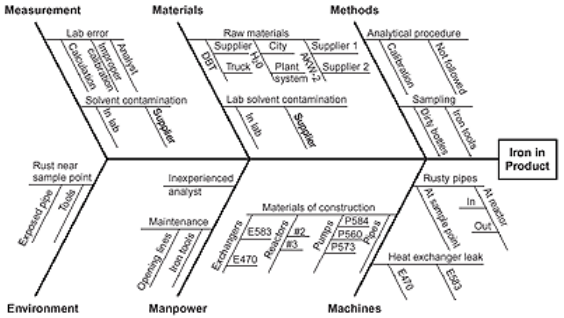
A check sheet is a structured, prepared form for collecting and analyzing data. This is a generic data collection and analysis tool that can be adapted for a wide variety of purposes and is considered one of the seven basic quality tools. This tool is often utilized for QC story step 2 and 6.

Control Chart



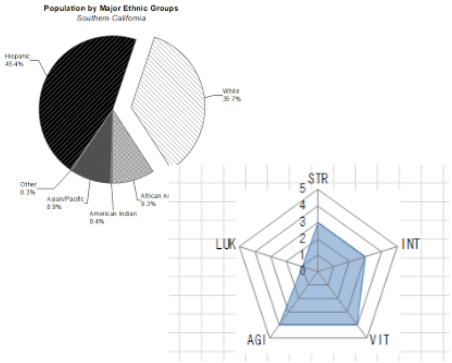
The control chart is a graph used to study how a process changes over time. Data are plotted in time order. A control chart always has a central line for the average, an upper line for the upper control limit, and a lower line for the lower control limit. This tool is often utilized for QC story step 2.

Cause-and-Effect Diagram (fishbone diagram)



The fishbone diagram identifies many possible causes for an effect or problem. It can be used to structure a brainstorming session. It immediately sorts ideas into useful categories. This tool is often utilized for QC story step 3.

Other graphs

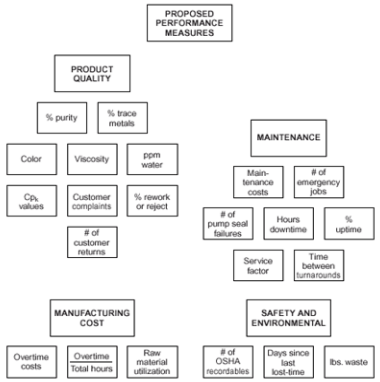


Graphs are a convenient tool to represent data in an easier understandable way. Graphs allow to communicate efficiently and easily without having to look at data tables and mentally depict the data meaning. This tool is often utilized for QC story step 2 and 6.

Source; https://asq.org/quality-resources

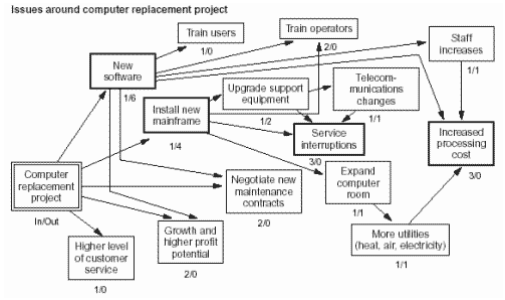
New seven QC tools (1)

Affinity Diagram



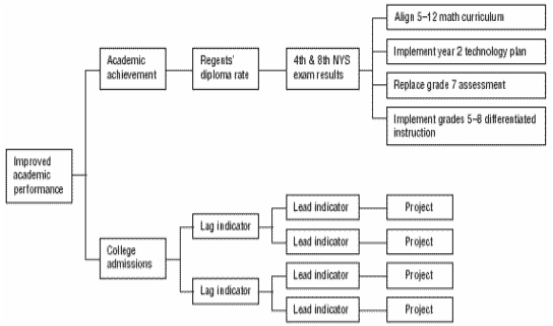
The affinity diagram organizes a large number of ideas into their natural relationships. It is the organized output from a brainstorming session. Use it to generate, organize, and consolidate information related to a product, process, complex issue, or problem. This tool is often utilized for QC story step 3.

Relation Diagram



An interrelationship diagram is defined as a new management planning tool that depicts the relationship among factors in a complex situation. The interrelationship diagram shows cause-and-effect relationships. Its main purpose is to help identify relationships that are not easily recognizable. This tool is often utilized for QC story step 2.

Tree Diagram



A tree diagram is a new management planning tool that depicts the hierarchy of tasks and subtasks needed to complete and objective. The tree diagram starts with one item that branches into two or more, each of which branch into two or more, and so on. The finished diagram bears a resemblance to a tree, with a trunk and multiple branches. This tool is often utilized for QC story step 4.

Matrix Diagram

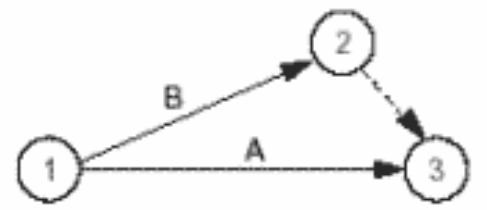
Possible KAIZEN theme	Impact	Urgency	Possibility	Resources availability	Feasibility check score
Waste management at Female ward is improved	3	3	3	2	11
Mistakes of specimen collection is reduced	2	2	3	3	10
Medicine wastage volume is reduced	3	2	2	2	8

A matrix diagram is defined as a new management planning tool used for analyzing and displaying the relationship between data sets. The matrix diagram shows the relationship between two, three, or four groups of information. It also can give information about the relationship, such as its strength, of the roles played by various individuals or measurements. This tool is often utilized for QC story step 1 and 4.

Source; https://asq.org/quality-resources

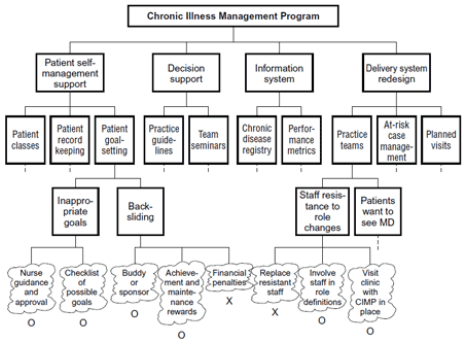
New seven QC tools (2)

Arrow Diagram



An arrow diagram is defined as a process diagramming tool used to determine optimal sequence of events, and their interconnectivity. It is used for scheduling and to determine the critical path through nodes. The arrow diagramming method shows the required order of tasks in a project or process, the best schedule for the entire project, and potential scheduling and resource problems and their solutions. This tool is often utilized for QC story step 5.

Process Decision Program Chart (PDPC)



The process decision program chart (PDPC) is defined as a new management planning tool that systematically identifies what might go wrong in a plan under development. Countermeasures are developed to prevent or offset those problems. By using PDPC, you can either revise the plan to avoid the problems or be ready with the best response when a problem occurs. This tool is often utilized for QC story step 5.

Matrix Data Analysis

Primary	Secondary	Tertiary	Importance	Target Value	W	X	Y	Z
Appearance	Visual	Colour	1	5	4	5	4	3
		Clarity	1	4	3	4	5	4
	Perceived	Perfume	2	5	5	3	2	4
		Strength	2	5	4	4	4	3
Function	Lather	Copious	3	4	3	4	4	5
		Dense	2	5	5	3	4	4
		Durable	1	4	3	3	5	2
	Effect	Clean Hair	3	5	4	2	3	2
		Shiny Hair	2	5	5	2	4	5

It is to present numerical data about two sets of factors in a matrix form and analyze it to get numerical output. The factors most often are products and product characteristics. The purpose then is to analyze the data on several characteristics for a number of products and use the information to arrive at optimum values for the characteristics for a new product or to decide the strong points of a product and use the information for designing a strategy for the promotion of the product. This tool is often utilized for QC story step 6.

Source; https://asq.org/quality-resources

Think that KAIZEN activity is a small project

- A project is a series of tasks that need to be completed to achieve a specific outcome.
- In KAIZEN activities, the specific outcome is referred to as the “KAIZEN Theme.”
- The series of tasks corresponds to the seven KAIZEN steps (Steps 1–7).
- To carry out a project and achieve the desired outcome, a project team—also known as a Work Improvement Team—should be established

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Any question, comments, clarification you need?

The 5S-KAIZEN-TQM approach training materials

KAIZEN with QC Story
Step 1:
Selection of the KAIZEN Theme

Japan International Cooperation Agency

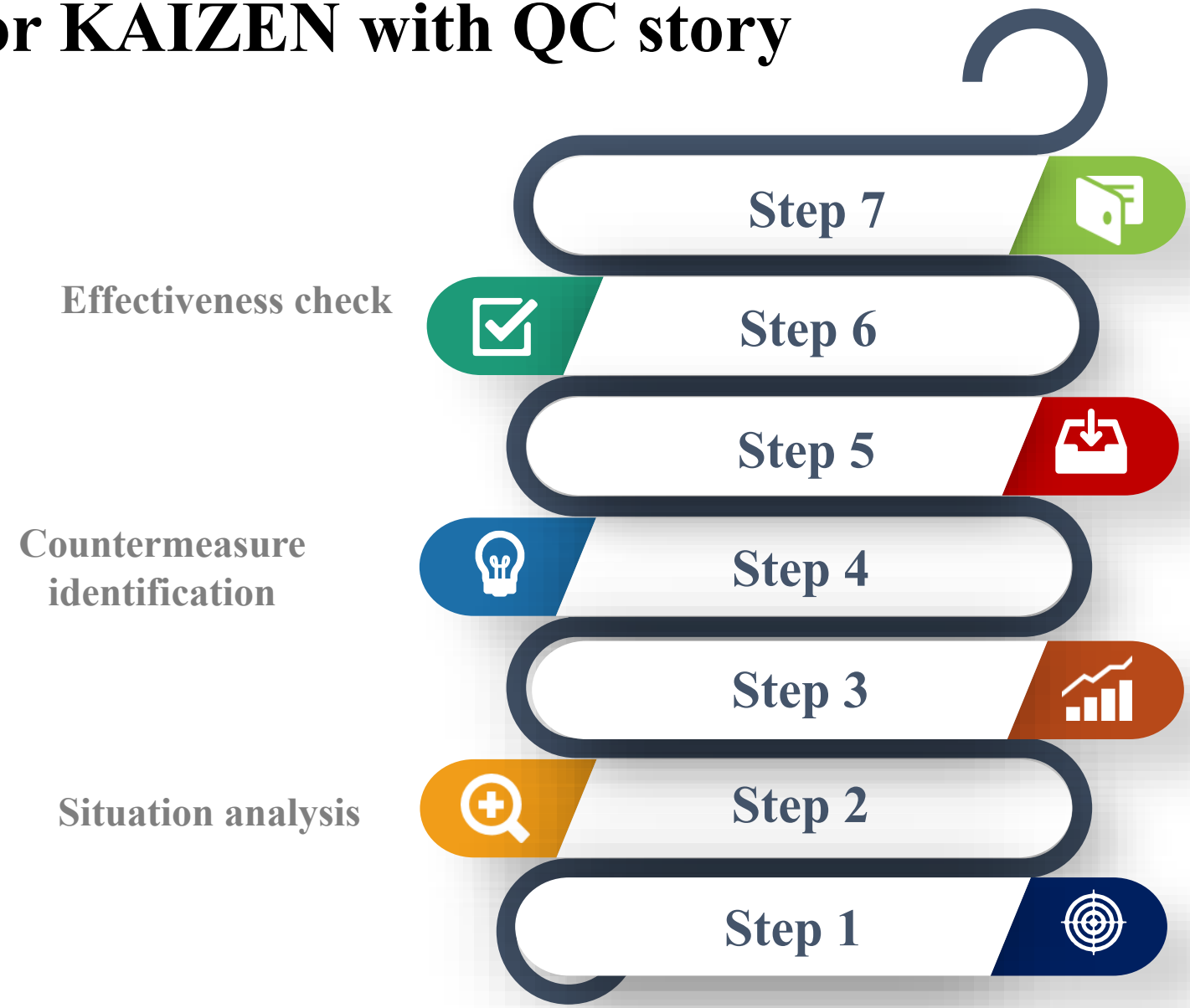
Fujita Planning Co., Ltd.

Objectives

At the end of the lecture, the participants will be able

- To understand the overall concept of QC story Step 1
- To explain about the procedures of QC story Step 1
- To explain about how to use Matrix diagram (QC tool)
- To explain about how to write Problem statement
- To carry out QC story Step 1

Steps for KAIZEN with QC story



KAIZEN Theme selection

This step focuses on prioritizing problems that can be addressed with the resources currently available.

Definition of KAIZEN theme

A problem identified and prioritized by the Quality Improvement Team (QIT) or Work Improvement Team (WIT) for improving work processes, service delivery, resource management, and other areas to meet clients' needs and support the hospital's vision and mission

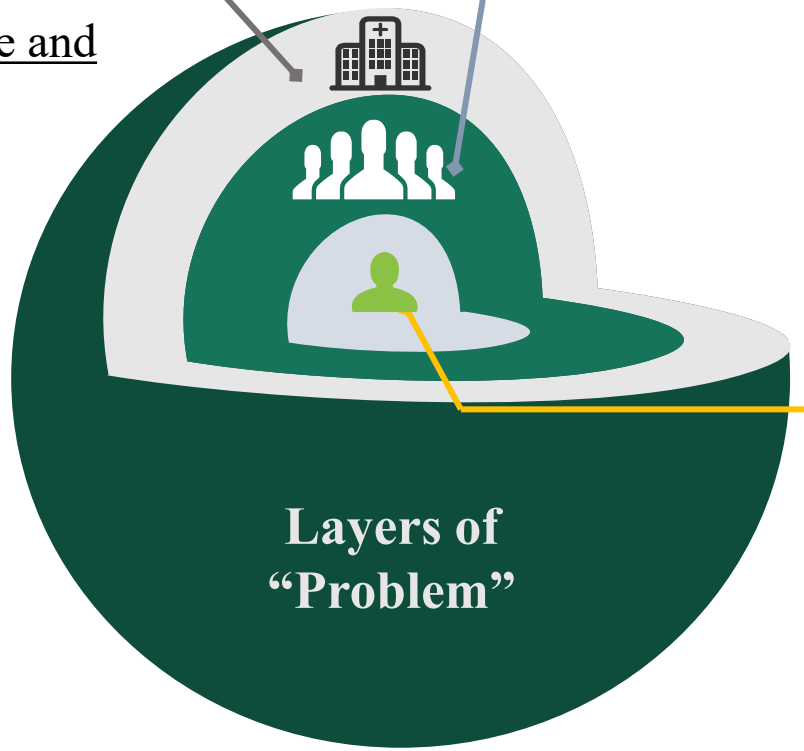
Identifying problems in the workplace and narrowing down the targets for improvement ("KAIZEN")

Layers of problems and who should be taken care by?

Organizational issues or
Common problems found in the facility

It is suitable to be a KAIZEN theme and it should be taken care **by QIT**

- Waiting time
- Commodity management
- Healthcare waste management
- Health financing etc.



Section/department issues

It is suitable to be a KAIZEN theme and it should be taken care **by WIT**

- Team work
- Work process and flow
- Health resource management
- Patient and staff safety etc.

Individual issues

This is NOT suitable to be a KAIZEN theme

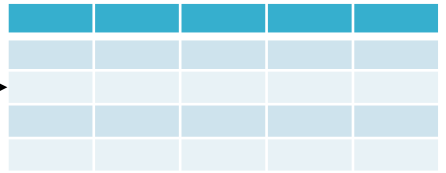
- Salaries
- Promotion
- Communication with co-workers etc.

Overall Process of the Step 1

Implement Quick KAIZEN cases

Problems that can be solved with **Quick KAIZEN**

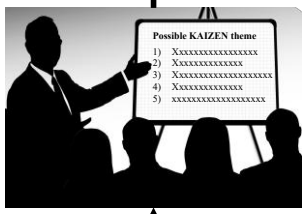
Problems that need to be solved with **KAIZEN with QC story**



⑤ Select one theme and write its problem statement

④ Check feasibility of the possible theme with **Matrix diagram**

③ Discuss and categorize the problems into two categories



② List all identified problems

① Brainstorm about problems in your department/ section

How to select a KAIZEN theme

Feasibility check of "Possible KAIZEN theme"

- Check the feasibility of possible KAIZEN themes using a **matrix diagram**
- The feasibility of each potential KAIZEN theme is assessed based on the following criteria: **impact, urgency, feasibility, and resource availability**.
- A matrix diagram is used to compare these factors, enabling more informed and effective decision-making.

Possible KAIZEN theme	Impact	Urgency	Possibility	Resources availability	Feasibility check score

Key questions to check the feasibility?

Items for feasibility check	Key questions for each item
Impact	• What impact will be solving this problem have on our clients?
Urgency	• Is it necessary to solve the problem immediately?
Possibility	• Is it possible to solve the problem within your section/department without involving many other sections? • Is it feasible to complete the entire KAIZEN process within 6 months?
Resources availability	• Can this be implemented using existing resources such as finance, human resources for health (HRH), and materials? • Is data and information available for the situation analysis? If not, is it possible to collect the necessary data?

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How to develop Matrix diagram for feasibility check

Date of implementation of the step should be written

Implemented on 30th March 2024

Possible KAIZEN theme is written under "positive manner/wishes"

Possible KAIZEN theme	Impact	Urgency	Possibility	Resources availability	Feasibility check score
Waste management at Female ward is improved	3	3	3	2	11
Mistakes of specimen collection is reduced	2	2	3	3	10
Medicine wastage volume is reduced	3	2	2	2	8

Score scale
3: High priority, Easy to implement
2: Middle priority
1: Low priority, Difficult to implement

The scale of feasibility should be clarified

Give red circle on top of the highest score, which will recognize as **the KAIZEN Theme**

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How to develop Matrix diagram for feasibility check

Implemented on 30th March 2024

Possible KAIZEN theme	Impact	Urgency	Possibility	Resources availability	Feasibility check score
Waste management at Female ward is improved	3	3	3	2	11
Mistakes of specimen collection is reduced	3	2	3	3	11
Medicine wastage volume is reduced	3	2	2	2	8

In the event of a tie in the feasibility check scores, the team should re-evaluate the feasibility. If the department has sufficient staff involved in quality management, two KAIZEN teams may be formed to implement both KAIZEN themes and carry out the problem-solving process.

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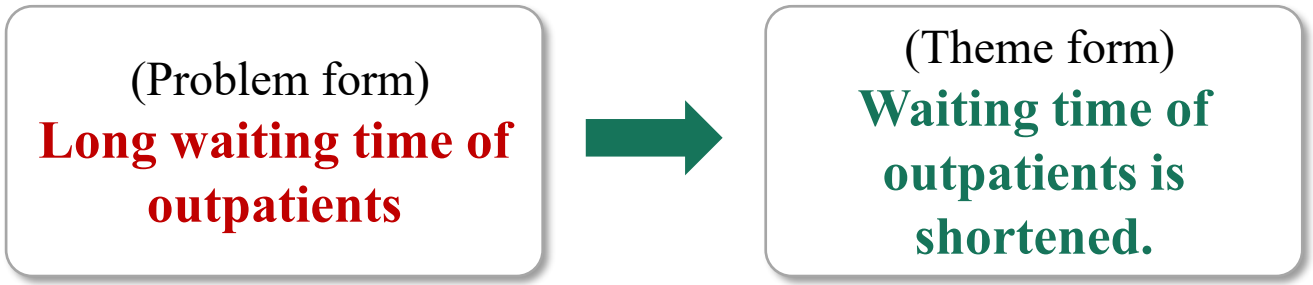
KAIZEN Theme form = your positive wishes!

- Use Matrix diagram to check feasibility of "Possible KAIZEN theme"
  - ✓ Change problem form to theme form:



  - ✓ Check the feasibility of each theme using a matrix diagram with four criteria: impact, urgency, feasibility, and resource availability.

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Problem statement

What is problem statement?

- Provide a concise description of the issue and outline the negative aspects of the current situation.
- Clarify how the problem affects the quality of healthcare services, including safety, effectiveness, patient-centeredness, timeliness, efficiency, equity, and other relevant dimensions.

Why problem statement is needed?

- Each member needs to describe the problem concisely.
- A clear explanation of the reason helps promote other staff members' interest in and participation in the activities.

Tips for writing a problem statement

- The problem statement must appeal to both reason and emotion.
- Define the problem being addressed in a clear and precise manner.
- Apply the 5 W's (Who, What, Where, When, and Why) to the problem statement.
- A clear problem statement will help identify the contributing factors in Step 2.

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Example of problem statement

KAIZEN Theme	Waste management at Female ward is improved
Problem statement	
Female ward staff (who) often observe improper waste management (what) in the Female Ward (where), such as incorrect waste segregation, mixing of color-coded bin liners, and overflow of the sharps box (when). This situation leads to a high risk of infections and injuries among healthcare workers and support staff in the ward, as well as increased costs for waste management (why). Therefore, the staff of the Female Ward would like to address this problem to improve safety for both internal and external clients and to enhance cost-effectiveness in the ward.	

The description of the problem is very important. This part helps identify the contributing factors

Description of how the problem affects the quality of healthcare services and their management

Commitment to solving the problem and achieving the desired status

Self-checklist for Step1

After completing Step 1, please use the following checklist to ensure that all procedures have been correctly carried out.

Points to check	Yes	No
Check how the KAIZEN theme was selected. Was it chosen and agreed upon by all staff working in the section/department?		
Check whether they have selected a theme that can be solved within the section/unit		
Check whether the KAIZEN theme was selected using a Matrix Diagram.		
Check whether the feasibility scale is clearly defined.		
Ensure the KAIZEN theme is written in a positive manner.		
Is the problem statement clearly stated?		

Quate from Taiichi Ohno

Taiichi Ohno : 1912 – 1990
Former vice president of TOYOTA Motors
Father of Toyota Production System

- ***Without standards, there can be no improvement.***

http://mike-shimada.c.blog.so-net.ne.jp/_images/blog/_3ea/mike-shimada/E382B9E382AFE383AAE383BCE383B3E382B7E383A7E38383E38388EFBC882014-05-11205.03.15EFBC89.png

Any question, comments, clarification you need?

The 5S-KAIZEN-TQM approach training materials

KAIZEN with QC story Step 2 “Situation Analysis”

Japan International Cooperation Agency

Fujita Planning Co., Ltd.

Objectives

At the end of the lecture, the participants will be able

- To understand the overall concept of QC story Step 2
- To explain about contributing factors and Quality Characteristic Value
- To explain about the procedures of QC story Step 2
  - Data collection and analysis
- To explain about how to develop Pareto chart (QC tool)
- To carry out QC story Step 2

Steps for KAIZEN with QC story

Situation analysis

Step 2 is to identify the contributing factors that influence the KAIZEN theme (problem). It also involves analyzing the frequency of occurrence of each contributing factor and their characteristic values.

Even if you decide to “reduce the number of clinical errors or service defects,” you will not be able to find an effective solution unless you first understand **how many errors are occurring, what types of errors they are, and where they are happening within the facility**.

Therefore, a situational analysis is required to understand the current status of the problem. Since the problem is caused by multiple factors, it is important to use a **priority-oriented approach** to address it efficiently.

Step 2 is to know about “the selected problem”

- After selecting the KAIZEN theme, it is necessary to understand the current situation of the problem (i.e., the KAIZEN theme).
- To assess the situation or details of the problem, it is essential to identify the ***contributing factors*** that make up the selected problem.
- It is also important to determine which contributing factors have the greatest impact on the KAIZEN theme by using a **priority-oriented approach** (Pareto rule).
- Moreover, since the KAIZEN approach is an evidence-based problem-solving process, it is necessary to count and measure ***quality characteristic values*** (variables or attributes) as indicators to assess the magnitude and significance of the problem

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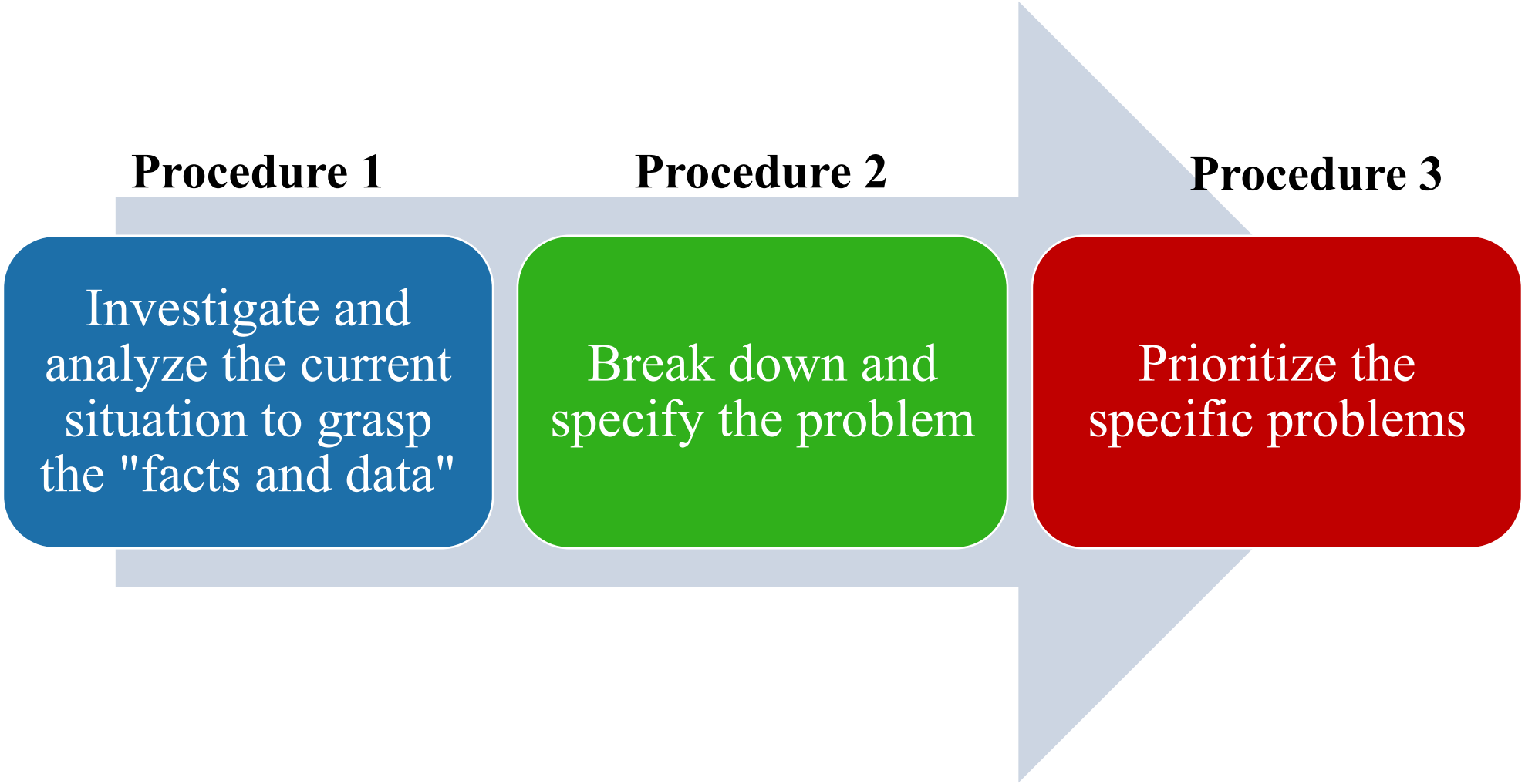
Three basic procedures to understand the current situation



Procedure 1

Procedure 1	Objectives	Key points
Investigate and analyze the current situation to grasp the "facts and data"	To identify and organize the facts and data related to the current situation (fact control).	• Avoid making preconceived or assumptive judgments based solely on personal experience; instead, focus on understanding the facts and data. • Understand the facts from multiple angles by collecting accurate information and data through a local, hands-on approach. • Examine and consider the problem from different perspectives, such as trends over time, past history, averages, and variations.

Procedure 2

Procedure 2	Objectives	Key points
Break down and specify the problem	To identify the factors contributing to a complex problem.	• To clarify the suspected factors contributing to the problem based on work experience, work processes, and other relevant observations. • Based on daily work experience, identify and select the factors that are likely to have a significant impact among the possible contributing elements of the problem.

Procedure 3

Procedure 3	Objectives	Key points
Prioritize the specific problems	To measure the impact of each contributing factor and rank them according to their significance..	• To review the frequency of occurrence of each factor and assess its influence. • To arrange the factors in descending order of impact and identify those that constitute approximately 80% of the overall effect.

What need to be done in Step 2

- Identify the contributing factors that are influencing occurrence of the problem
- Count the frequency of occurrence of each contributing factor
- Use the priority-oriented approach (Pareto rule) to prioritize the factors that need to be addressed first.
- Identify the 'quality characteristic values' as indicators
- Measure the identified quality characteristic value
- Set a target for the quality characteristic value

What is “Contributing factors”?

- **“Contributing factor” is not the same as “cause.”**
  - “Contributing factors” refer broadly to elements that influence a problem by increasing its likelihood, accelerating its occurrence, affecting the severity of its consequences, or impacting the chain of events.
- **What influences the occurrence of the problem?**
  - A complex problem is often difficult to solve because it is affected by multiple contributing factors.
  - In general, the magnitude of each contributing factor varies. The greater the factor, the more significant its influence on the problem.
  - Therefore, it is essential to identify these contributing factors and address those that require the most attention first—specifically, the factors with the highest frequency or impact.

How to identify contributing factors

- When identifying contributing factors, it is necessary to consider the events or conditions that may influence the occurrence of the selected KAIZEN theme (problem).
- In this process, department/section staff and WIT members list the contributing factors—from the most significant to the least significant—based on their work experience and observations from daily work.

How to identify contributing factors

A big problem is difficult to solve because it is caused by several contributing factors

The need to identify the contributing factors of the KAIZEN theme and clarify the impact magnitude of each factor.

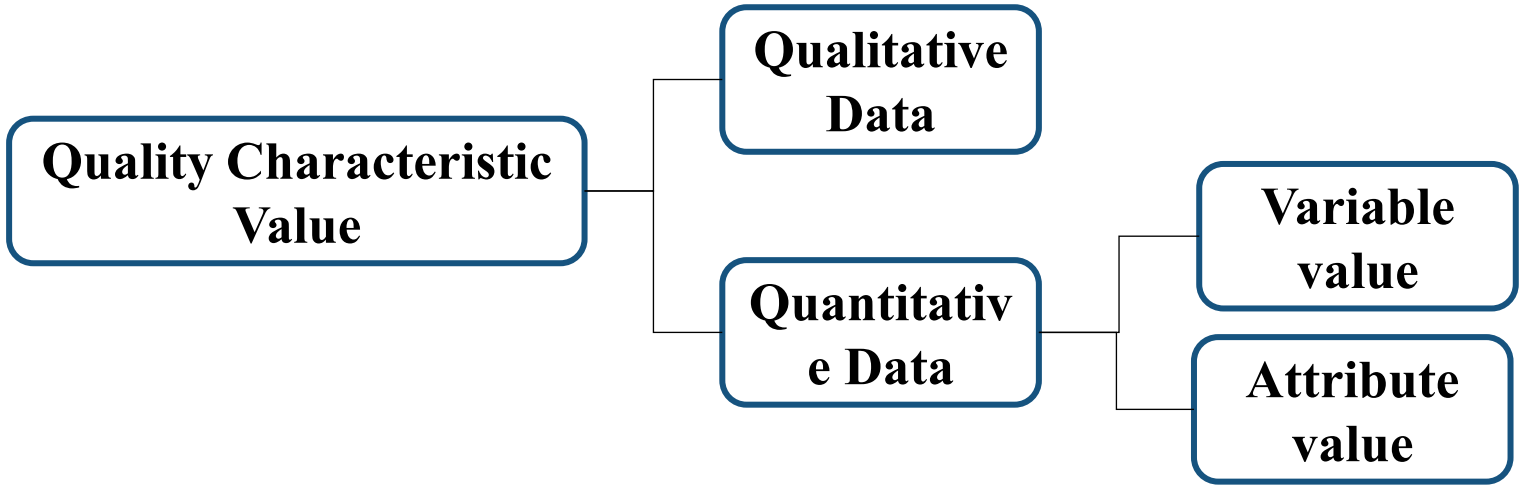
How to identify contributing factors

- Check your selected KAIZEN theme and problem statement to confirm what the real problem is.
- One method for identifying contributing factors is to examine the workflow, work processes, protocols, and standard operating procedures (SOPs) related to your KAIZEN theme and determine where bottlenecks contribute to the occurrence of the problem.
- When contributing factors are identified and their frequencies are counted, they should be described as follows:
  - Number of cases in which xxxxxxx is observed
  - Number of cases in which xxxxxxx is not done
  - Number of files in which xxxxxxx is missing

What are the “QCV(Quality Characteristic Values)”?

Quality Characteristic Values can be classified as either variables or attributes.

- **Variable values** are data measured on a continuous scale. They usually have units such as length (m), weight (g), or time (h).
- **Attribute values** are data that can be counted as discrete numbers (e.g., 1, 2, 3). Examples include the number of people, defect rates, or the number of complaints from patients.



Examples of “Quality Characteristic Values”

KAIZEN theme	Examples of QCV	
“Long waiting time is reduced”	Waiting time	45 min
“Revenue collection is improved”	Amount of cash revenue	2500 USD
“Hand hygiene is improved”	Volume of hand sanitizer used	150ml/350ml (48%)
“Admission and discharge process is improved”	Time spent for admission and discharge	35 min
”Inventory of central store is improved”	Procurement costs Out of stock rate	30 USD 5 days / 20 days (25%)
“Blood transfusion supply is improved”	Rate of discarded packed red blood cells	6 packs/15 packs (40%)
Documentation of referral form is improved	Document completion rate	20%

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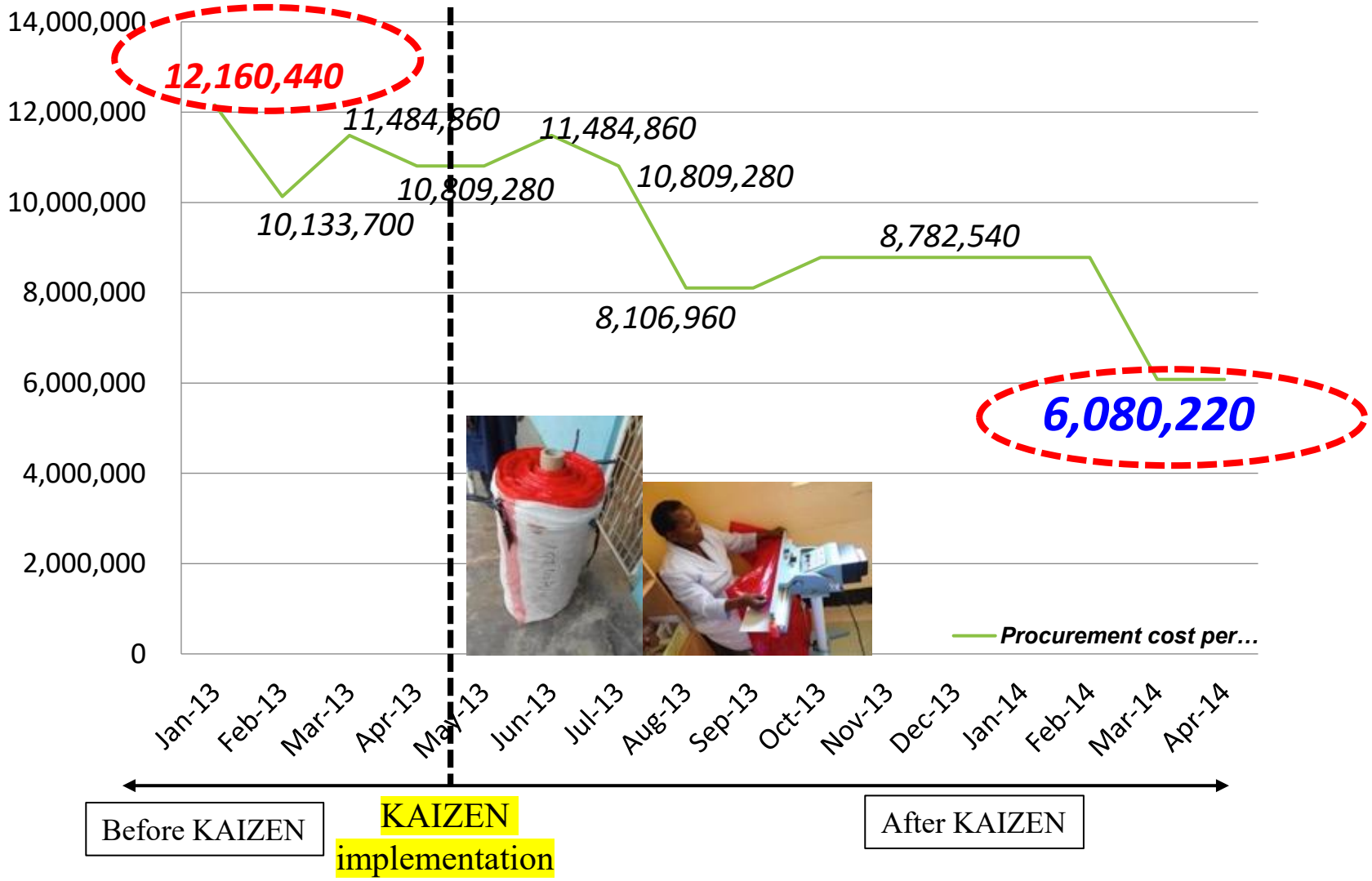
Visualization of QCV

- Data visualization is the representation of data using common graphics such as charts, plots, infographics, and even animations. These visual displays help communicate complex data relationships and data-driven insights in a clear and understandable way.
- Quality Characteristic Values (QCVs) can be visualized using different types of graphs, making it easier to compare changes before and after KAIZEN.

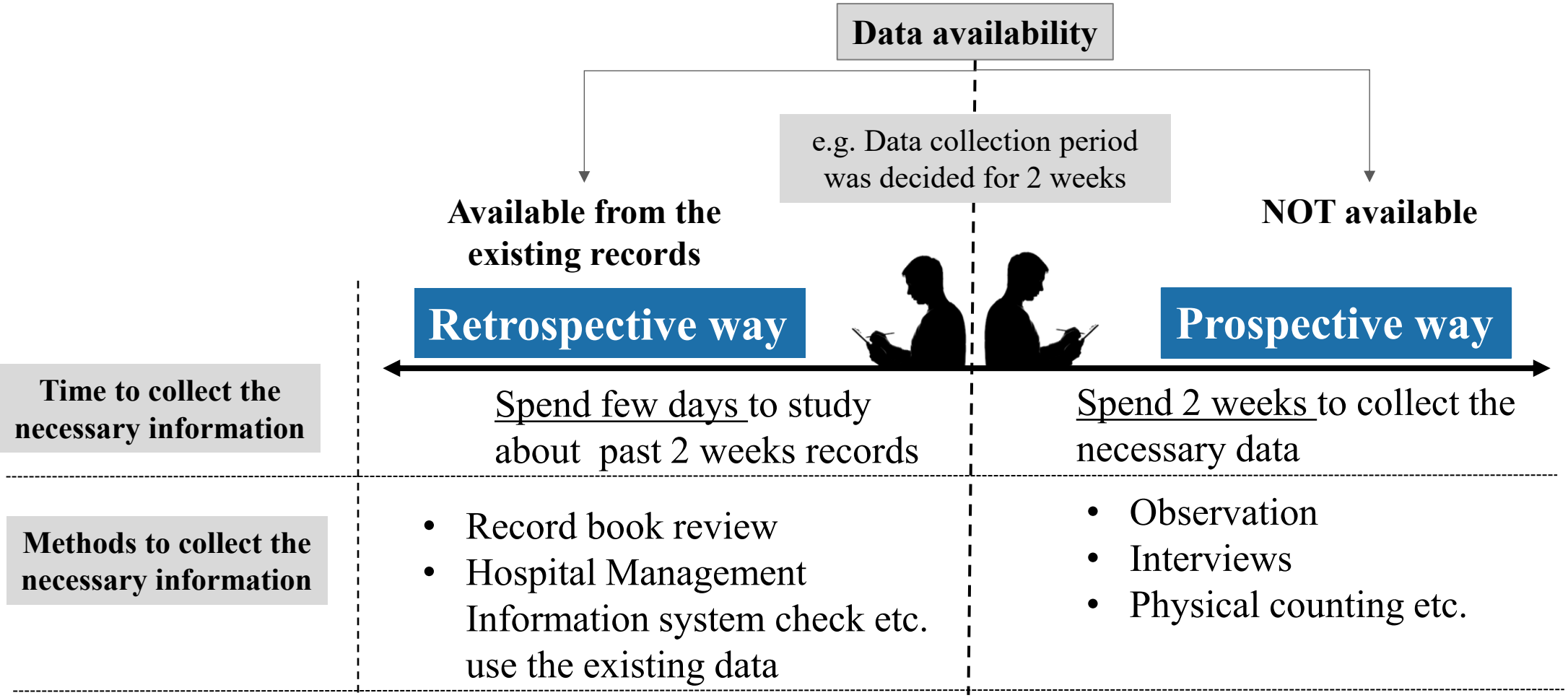
https://www.ibm.com/topics/data-visualization#:~:text=IBM-,What%20is%20data%20visualization%3F,that%20is%20easy%20to%20understand.
https://www.techfunnel.com/martech/data-visualization/

Example of collecting data of “Quality Characteristic value”

Cost of procurement of bin liners (“Cost” is the characteristic value of this KAIZEN case)



How to collect data for Step 2?



For the baseline assessment of the Quality Characteristic Values (QCVs) in Step 2, data collection should be conducted based on the indicators (QCVs) selected according to the KAIZEN theme. During the designated data collection period, the number of samples to be collected must be determined, and information should be gathered accordingly.

A useful tool for data collection: “Check sheet”

- A check sheet is one of the seven QC tools. It is a structured, pre-designed form used for collecting and analyzing data. It is a generic data collection and analysis tool that can be adapted for a wide variety of purposes.

Example of check sheet

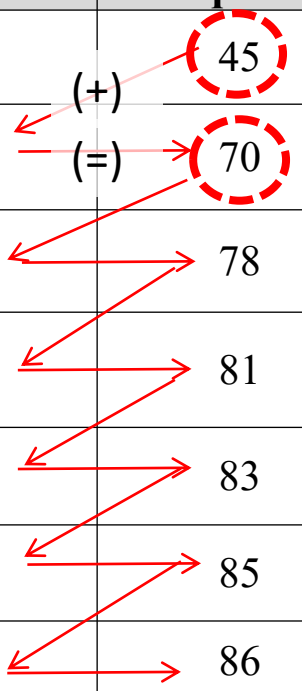
Reason	Day					
	Mon	Tues	Wed	Thurs	Fri	Total
Wrong number	𝍸	||	|	𝍸	𝍸 ||	20
Info request	||	||	||	||	||	10
Boss	𝍸	||	𝍸 ||	|	||||	19
Total	12	6	10	8	13	49

https://asq.org/quality-resources/check-sheet

How to develop “Calculation table”?

KAIZEN Theme	**Documentation of patient’s treatment record is improved**
Problem statement	Internal medicine ward had a problem of missing information on the patient’s treatment record, which is affecting treatment of patients.

SQ#	Contributing factors	Frequency	Cumulative frequency	Cumulative (%)
1	Number of cases vital signs are missing	45	45	52.3
2	Number of cases information on prescribed medicines are missing	25	70	81.4
3	Number of cases information on laboratory tests is missing	8	78	90.7
4	Number of cases patient’s basic information is missing (Name, Age, Date of birth etc.)	3	81	94.2
5	Number of cases information on diagnosis is missing	2	83	96.5
6	Number of cases information on radiology investigation is missing	2	85	98.8
7	Number of cases investigation code is missing	1	86	100.0
	Grand Total	**86**	-	-



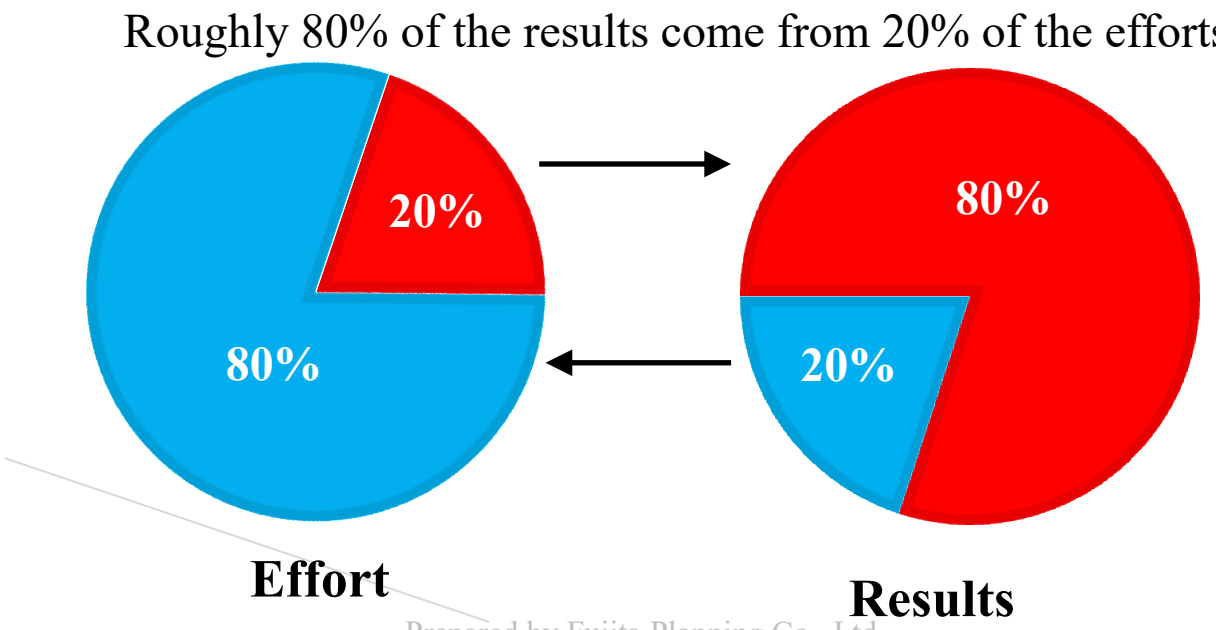
Priority-oriented approach

- A priority-oriented approach examines the impact of factors on the results and prioritizes those with the greatest influence in order to achieve the goal.
- By counting the frequency of occurrence of each contributing factor over a given period and using a Pareto chart, it becomes possible to identify and prioritize the factors that need to be addressed first.

Pareto rule

(Vilfredo Federico Damaso Pareto, Economist)

- The Pareto Principle states that 80% of the effect of something can be attributed to just 20% of the drivers.
- The 80/20 percentages are not absolute but serve as a general guideline to help focus efforts and improve outcomes.



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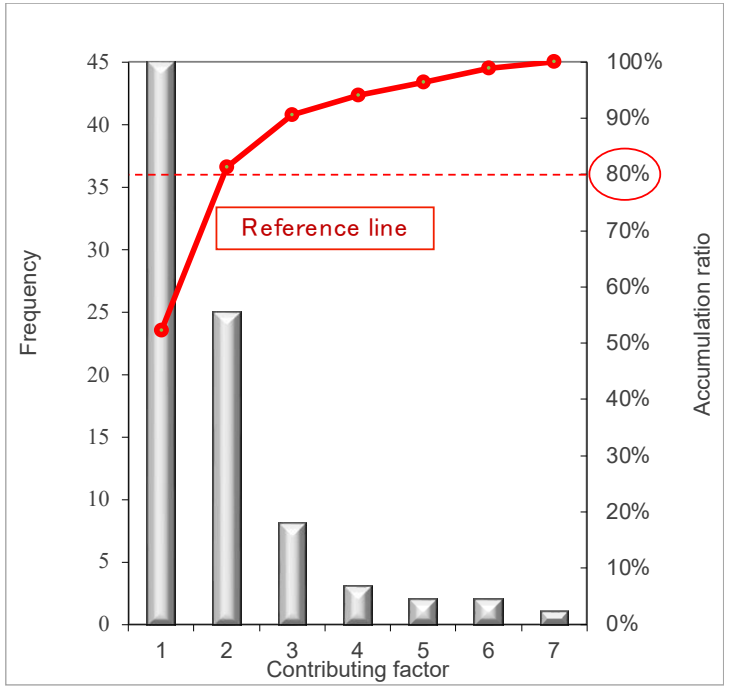
What is Pareto chart?

- Pareto charts are extremely useful for analyzing which problems need attention first.
- They are a type of chart that contains both bars and a line graph, where individual values are represented in descending order by bars, and the cumulative total is represented by the line.
- Set a 'reference line' at 80% based on the Pareto (80:20) rule
- A Pareto chart is used when there are multiple contributing factors and prioritization is needed. However, not all QC Story cases require the use of a Pareto chart. Only apply it when it is appropriate for the type of data and the nature of the problem."



http://en.wikipedia.org/wiki/Pareto chart
https://whatis.techtarget.com/definition/Pareto-chart-Pareto-distribution-diagram

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Cases where a Pareto chart is NOT needed

- **When there is only one clear contributing factor**
  Example: A single broken machine is causing delays.
- **When the data are continuous and do not require frequency comparison**
  Example: Measuring patient waiting time (a variable).
  → A line graph or histogram is more appropriate.
- **When the team already knows the priority through workflow or process mapping**
  Example: A bottleneck identified through a process flow diagram.
- **When the theme focuses on eliminating a specific defect, not comparing factors**
  Example: “Reduce expired drugs in the store”
  → The main factor may already be known.
- **When data collection is small or qualitative**
  Example: Documenting procedure compliance or SOP adherence.

Procedures for Step 2 implementation

Identify the contributing factors and QCV

Decide the data collection methods for each contributing factors & QCV

Record the data collection method and period of data collection

Collect the information and data, count the frequency of occurrence of identified each contributing factors and selected QCV

SQ#	Contributing factors	Frequency	Cumulative frequency	Cumulative %
1	Number of cases vital signs are missing	45	45	52.3
2	Number of cases information on prescribed medicines are missing	25	70	81.4
3	Number of cases information on laboratory tests is missing	8	78	90.7
4	Number of cases patient's basic information is missing (Name, Age, Date of birth etc.)	3	81	94.2
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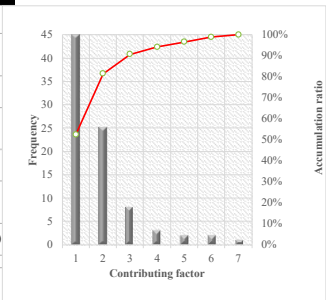

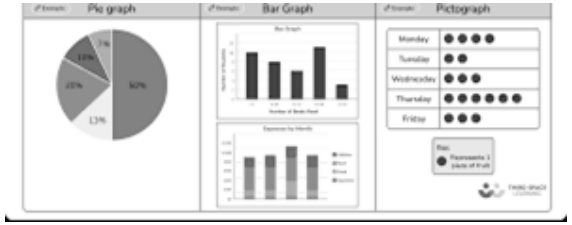

Develop a calculation table and Pareto chart. Clarify "Vital few" for Step 3

Step 2 procedures (1)

① Brainstorm and identify the contributing factors of the problem (KAIZEN theme) selected in Step 1.
② Identify the Quality Characteristic Value (QCV) for the selected KAIZEN theme.
③ Decide on appropriate data collection methods (e.g., observation, interviews, physical counts) for gathering information on both the contributing factors and the QCV.
④ Collect information and data, and count the frequency of occurrence of each identified contributing factor.
⑤ Collect information and data to measure the selected QCV

Step 2 Procedure (2)

⑥ Develop a calculation table using the collected data (frequency of contributing factors) and calculate the following:
- Cumulative frequency = (current frequency) + (previous cumulative frequency)
- Cumulative percentage = (cumulative frequency ÷ total frequency) × 100

⑦ Develop a Pareto chart based on the calculation table. Prioritize the contributing factor(s) to address according to the 80:20 rule.

⑧ Use additional QC tools and graphs to clarify and visualize the current situation related to your KAIZEN theme.

⑨ Present the collected Quality Characteristic Value (QCV) as the “before KAIZEN” situation (using graphs, charts, or tables as necessary).

⑩ Set a target for improvement.

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Step2 Procedure (3)

⑩ Develop Pareto chart from the calculation table to visualize the factors that need attention first based on the Pareto rule

"Calculation" table

SQ#	Contributing factors	Frequency	Cumulative frequency	Cumulative %
1	Number of cases vital signs are missing	45	45	52.3
2	Number of cases information on prescribed medicines are missing	25	70	81.4
3	Number of cases information on laboratory tests is missing	8	78	90.7
4	Number of cases patient's basic information is missing (Name, Age, Date of birth etc.)	3	81	94.2
5	Number of cases information on diagnosis is missing	2	83	96.5
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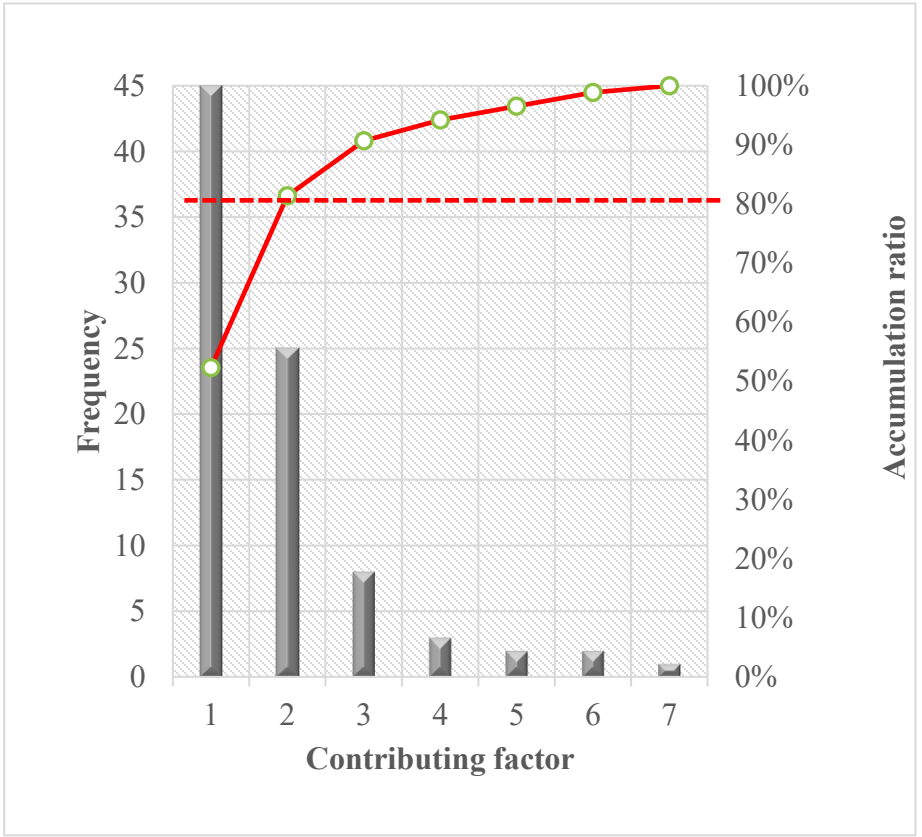
7	Number of cases investigation code is missing	1	86	100.0
	Grand Total	**86**	-	

"Pareto chart"



Set target for your KAIZEN case

- After identifying the Quality Characteristic Value (QCV) and measuring it, it is best to set a target for your KAIZEN case.
- Setting a target clarifies what should be achieved and motivates staff to carry out KAIZEN activities.
- It also allows for an objective evaluation of the results.

For example:

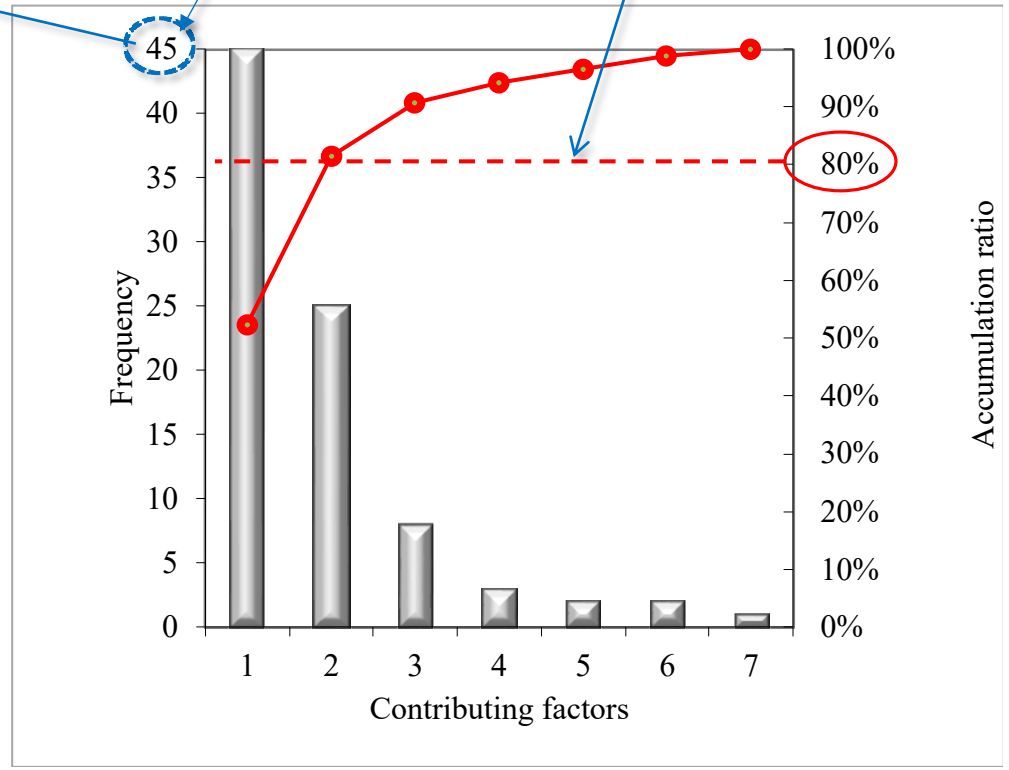
- KAIZEN theme: *"Reduce waiting time at OPD."*
- QCV: *Waiting time*
- Actual average waiting time at OPD: **45 minutes**
- Then, set an achievable target for your QCV.
  Example: Target = **50% improvement** → *Reduce waiting time to less than 22.5 minutes*

How to develop Pareto chart

SQ#	Contributing factors	Frequency	Cumulative frequency	Accumulation ratio
1	Number of cases vital signs are missing	45	45	52.3
2	Number of cases information on prescribed medicines are missing	25	70	81.4
3	Number of cases information on laboratory tests is missing	8	78	90.7
4	Number of cases patient's basic information is missing (Name, Age, Date of birth etc.)	3	81	94.2
5	Number of cases information on diagnosis is missing	2	83	96.5
6	Number of cases information on radiology investigation is missing	2	85	98.8
7	Number of cases investigation code is missing	1	86	100.0
	Grand Total	86	-	-

Those numbers need to be matched

Draw "reference line" on 80%



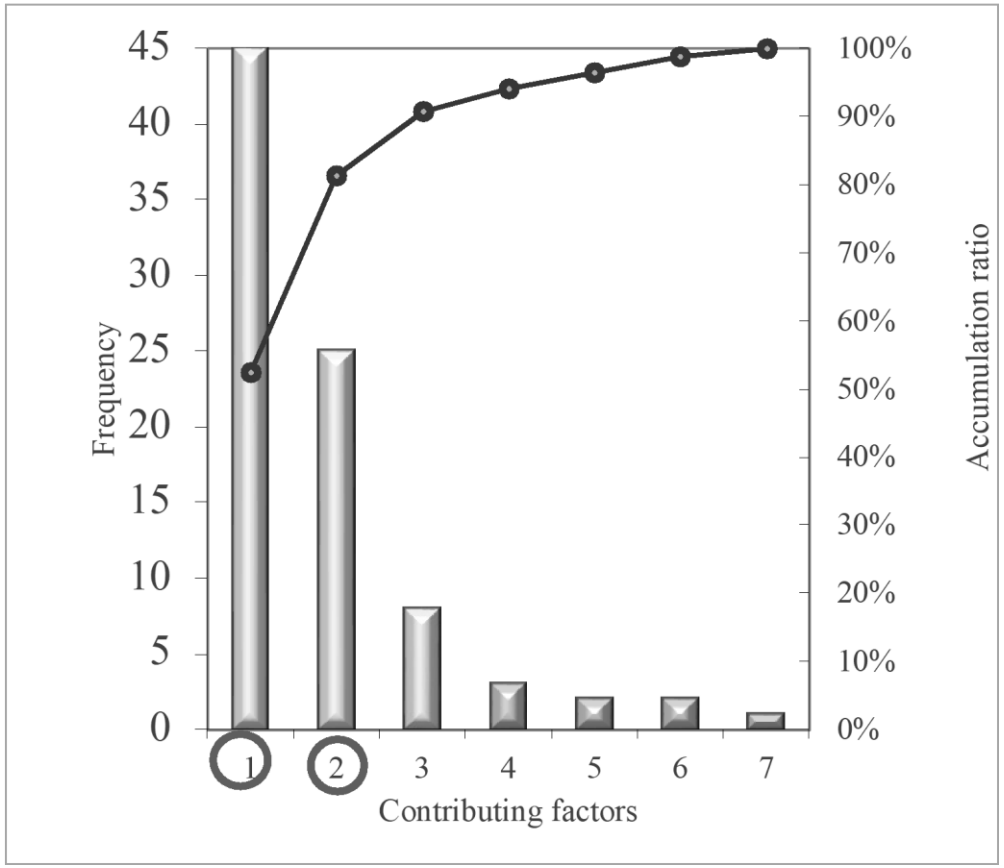
- Period of date collection: 30 days from May 1st to 30th
- Data source: medication and treatment chart
- Number of investigated patient (chart): 50

Methodologies of data collection need to be recorded clearly.

Check “vital few”, which you are going to pay attention

KAIZEN theme	Patient’s file/record is improved

SQ#	Contributing factors	Frequency	Cumulative frequency	Accumulation ratio	
1	Number of cases vital signs are missing	45	45	52.3	Vital few
2	Number of cases information on prescribed medicines are missing	25	70	81.4	Vital few
3	Number of cases information on laboratory tests is missing	8	78	90.7	Useful many
4	Number of cases patient’s basic information is missing (Name, Age, Date of birth etc.)	3	81	94.2	Useful many
5	Number of cases information on diagnosis is missing	2	83	96.5	Useful many
6	Number of cases information on radiology investigation is missing	2	85	98.8	Useful many
7	Number of cases investigation code is missing	1	86	100.0	Useful many
	Grand Total	86	-	-	



- Period of date collection: 30 days from May 1to 30
- Data source: medication and treatment chart
- Number of investigated patient (chart): 50

Characteristic value(s)	Current value
Patient file completion rate (%) Since we observe a lot of incomplete Patient files.	

Focus on solving the contributing factors categorized as "Vital few"

- Based on the *priority-oriented approach*, the Pareto rule helps clarify the *vital few* and the *useful many* among the identified contributing factors.
- The *vital few* indicate that the selected KAIZEN theme is largely influenced by a relatively small number of key factors (following the 80:20 rule).
- Most problems can be solved by focusing on these high-impact factors and addressing them according to their priority.

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What is in the next steps?

SQ#	Contributing factors	Frequency	Cumulative frequency	Accumulation ratio
1	Number of cases vital signs are missing	45	45	52.3
2	Number of cases information on prescribed medicines are missing	25	70	81.4
3	Number of cases information on laboratory tests is missing	8	78	90.7
4	Number of cases patient's basic information is missing (Name, Age, Date of birth etc.)	3	81	94.2
5	Number of cases information on diagnosis is missing	2	83	96.5
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7	Number of cases investigation code is missing	1	86	100.0
	Grand Total	86	-	-

Vital few → Step 3

- Root cause analysis will be done for each of vital few, in Step 3

Wrap-up of Step 2

- Problems that need to be solved through KAIZEN using the QC story are usually *complicated*.
- A *complicated problem* is made up of contributing factors of varying significance.
- The larger the problem, the more contributing factors are involved, making it more difficult to find a solution.
- Therefore, it is important to use a *priority-oriented approach* to identify and address the factors with the greatest impact, often using a Pareto chart. However, not all QC Story cases require a Pareto chart. Apply it only when it is appropriate for the type of data and the nature of the problem.

Self-checklist of Step2

After completing Step 2, please use the following checklist to ensure that all procedures have been carried out correctly.

Points to check	Self-check
Appropriate quantitative data were collected prospectively or retrospectively for each contributing factor (variable value), related to the selected KAIZEN theme.	Yes / No
Attribute values were identified, and appropriate quantitative data were collected prospectively or retrospectively for measuring characteristic values related to the selected KAIZEN theme.	Yes / No
Data source was appropriate and recorded properly.	Yes / No
Data collection method and period of data collection were appropriate and recorded properly.	Yes / No
Calculation of cumulative frequency and ratio was properly done on the compilation table	Yes / No
Pareto chart was developed properly based on the compilation table	Yes / No

Any question, comments, clarification you need?

The 5S-KAIZEN-TQM approach training materials

KAIZEN with QC story Step 3 “Root Cause Analysis”

Japan International Cooperation Agency

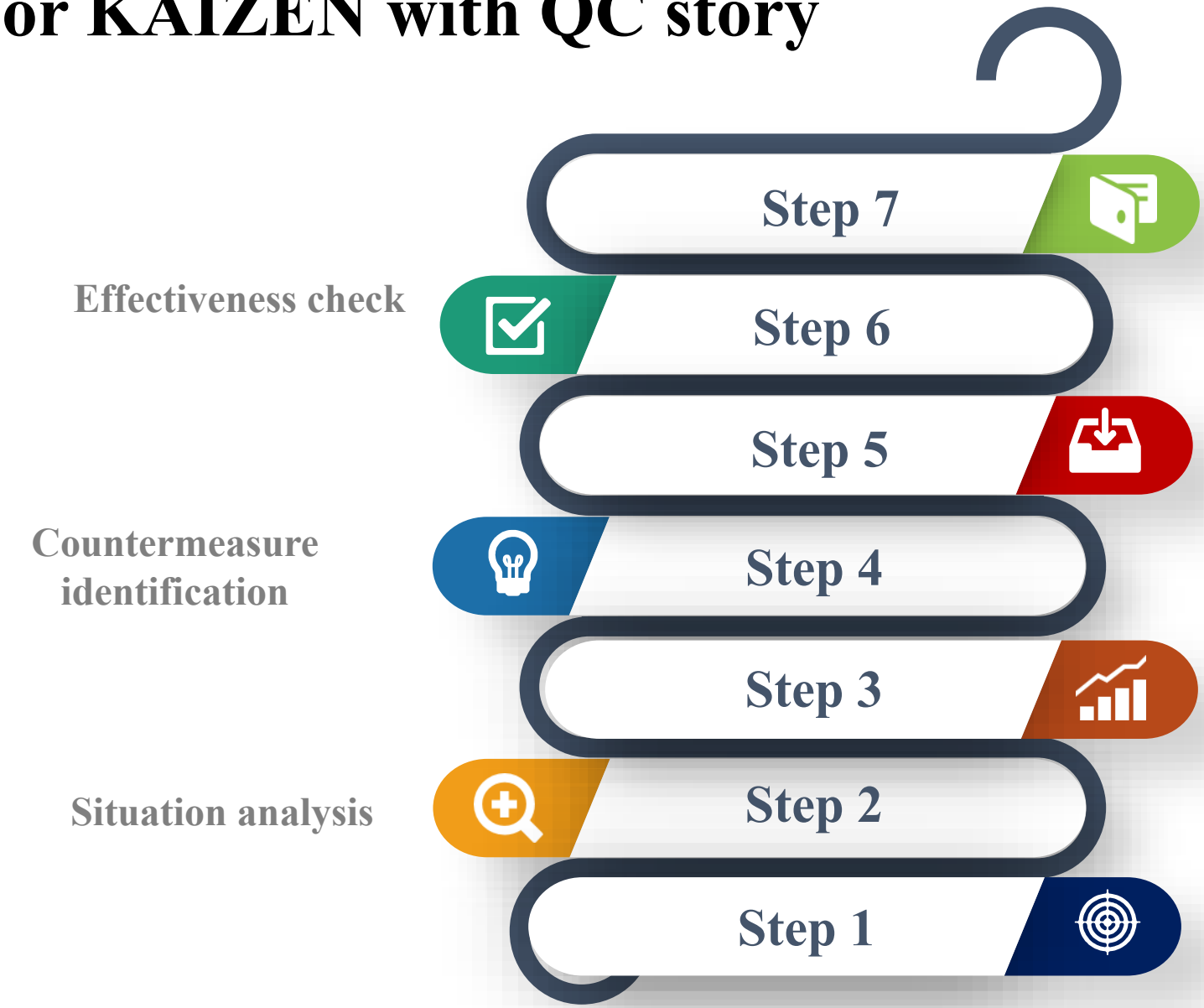
Fujita Planning Co., Ltd.

Objectives

At the end of the lecture, the participants will be able

- To understand the overall concept of QC story Step 3
- To explain about how to use Cause-Effect diagram (fish bone)
- To explain about the procedures of QC story Step 3
- To explain about how to develop Cause-Effect diagram (QC tool)
- To carry out QC story Step 3

Steps for KAIZEN with QC story



Standardization

Effectiveness check

Countermeasure implementation

Countermeasure identification

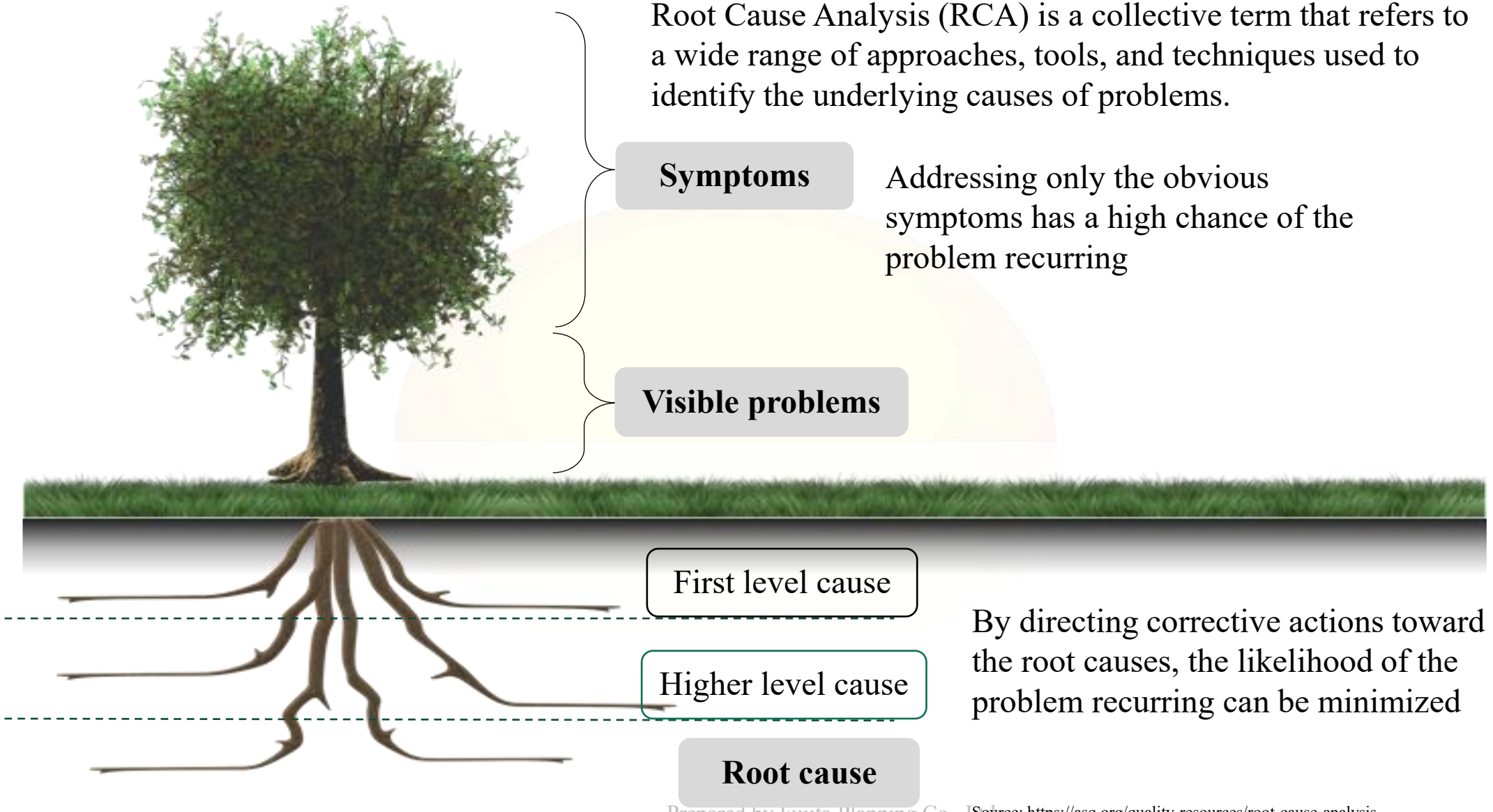
Root cause analysis

This step is to identify the root causes that causing the each contributing factors. It is also to clarify the cause - effect (contributing factor) relationship

Situation analysis

KAIZEN Theme selection

Root cause analysis (RCA)



Root Cause Analysis (RCA) is a collective term that refers to a wide range of approaches, tools, and techniques used to identify the underlying causes of problems.

Addressing only the obvious symptoms has a high chance of the problem recurring

By directing corrective actions toward the root causes, the likelihood of the problem recurring can be minimized

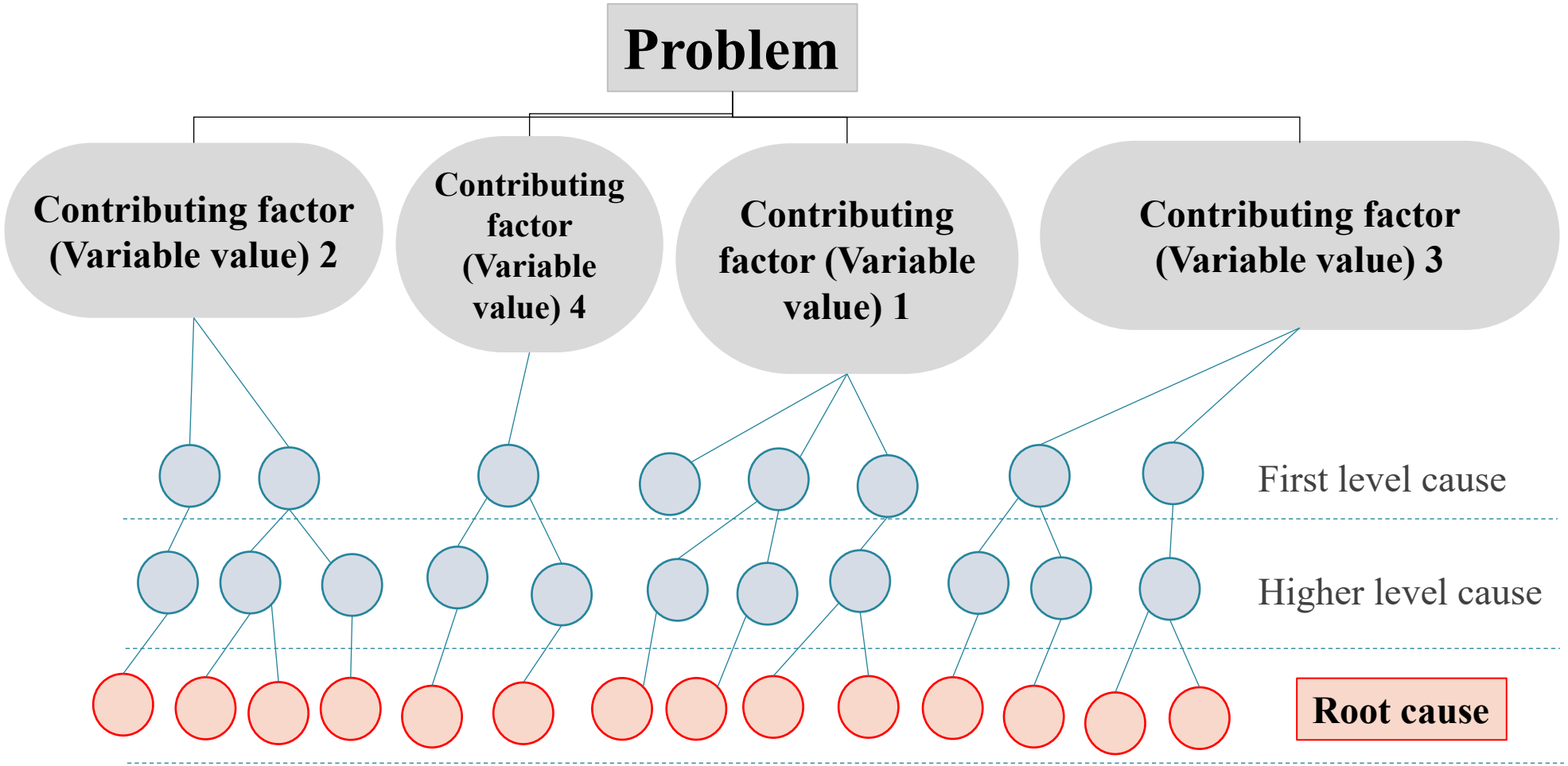
Source: https://asq.org/quality-resources/root-cause-analysis

Prepared by Fujita Planning Co., Ltd.

“Complicated problem” is composed of different size of Contributing factors

Each Contributing factor (Variable value) has various root causes

Composition of causes



Procedure for Step 3

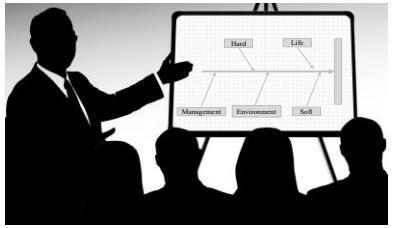
①

- Prepare the RCA by using a Fishbone Diagram.
- Draw the foundational structure (the ‘bones’) of the Fishbone Diagram.

②

Brainstorm and list as many potential causes of the effect as possible

③

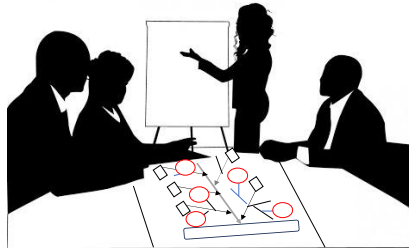


Discuss and categorize the identified ‘possible causes of the effect.’ When similar causes are found, consolidate them into a single category

④

Analyze each ‘possible cause’ by repeatedly asking, ‘Why is this happening? – because…’ as many times as needed, and then identify the root cause

⑤



Circle the identified root causes in red to ensure they are easily recognizable

What is “Fishbone diagram”?

Prof. Kaoru Ishikawa
(1915-1989, Japan)

- It systematically connects the “effect” and its “cause(s)” with lines to clarify the relationships between them.
- The fishbone diagram identifies many possible causes of an effect and clarifies the “cause–effect relationship.”
  - “Effect” refers to the result that is currently visible.
  - “Cause” refers to the factors that influenced or contributed to producing the result.

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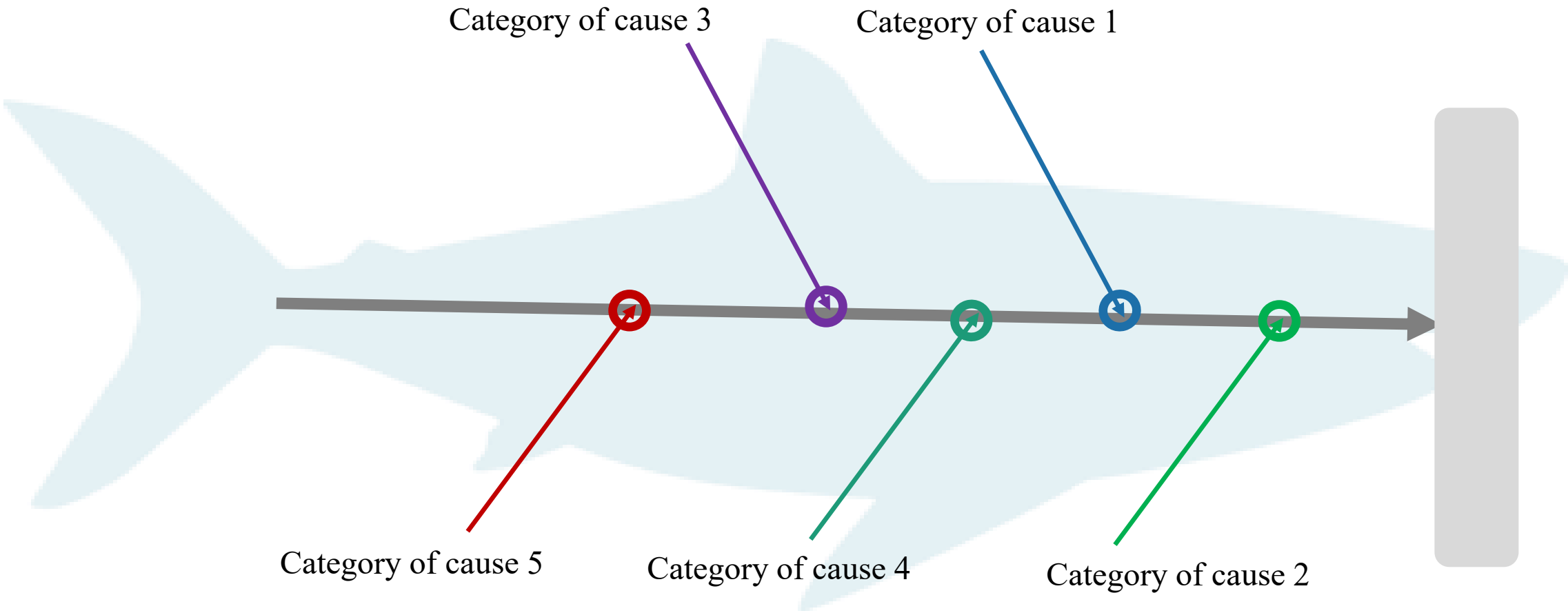
Structure of Fishbone diagram



Two types of Fishbone Diagram

Fishbone diagram <u>for Management</u>
<u>(Used for Task-achieving QC story)</u>

- It is used to prevent potential issues or risks that have not yet occurred.
- It aims to identify the factors that need to be controlled.
- It does not require asking the "Why? – because…" question.
- Developing the diagram requires knowledge, experience, and reasonable speculation.

Fishbone diagram <u>for Problem solving</u>

- It is used to solve problems that have already occurred.
- It is developed based on facts.
- It aims to analyze the root causes of the identified contributing factor(s).
- The "Why–Because" questioning technique is used to clarify the cause–effect relationship.

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Procedure of Step3
① Prepare RCA with “fishbone diagram”

- On a sheet of paper, draw a horizontal line across the page—this will become the “spine” of the fish. At the right end of the line, draw the “head” of the fish.
- Convert the contributing factor into a question, such as “Why is this happening?” and place it at the “head” of the fish.
- Draw lines extending diagonally from the spine—these are the “bones” of the fish. At the end of each line, write a category of causes that may lead to the issue written at the head.
- Cause categories can follow the 4M style (Man, Machine, Material, Method) or the MSHEL style (Management, Soft/Hard, Environment, Life).

Categories of cause

Style of Categories		Examples
MSHEL Often used in service sector	**4M** Often used in manufacturing sector	
Management		planning, strategies, monitoring, inventory etc.
Soft	Method	system, methodologies, mechanism etc.
Hard	Machine Material	material, equipment, furniture, tools etc.
Environment		facility environment (water supply, electricity, smell, humidity etc.), working environment (work space, accessibility of materials, arrangement
Life	Man	knowledge, skills, health conditions, physical conditions of workers.

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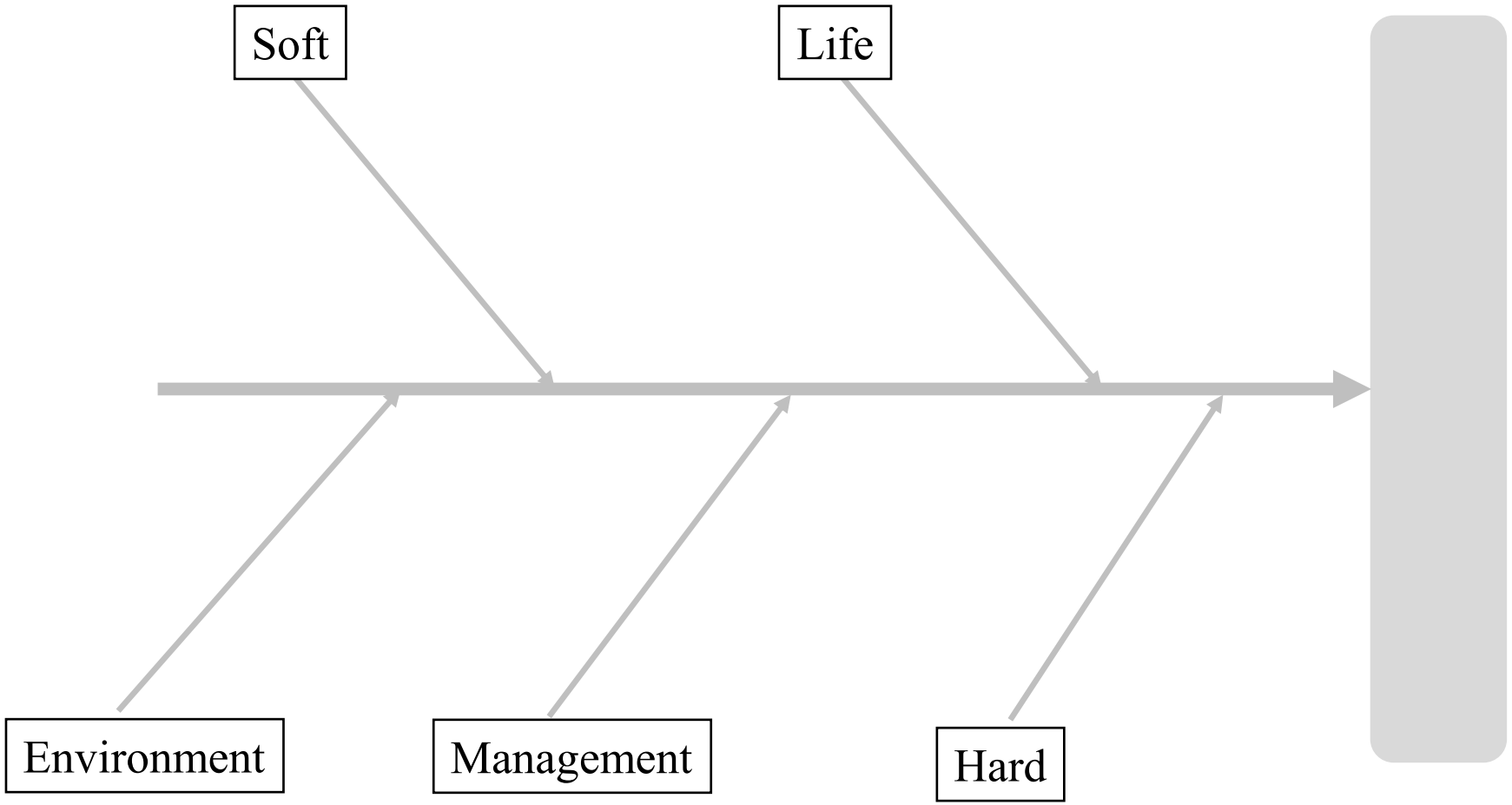
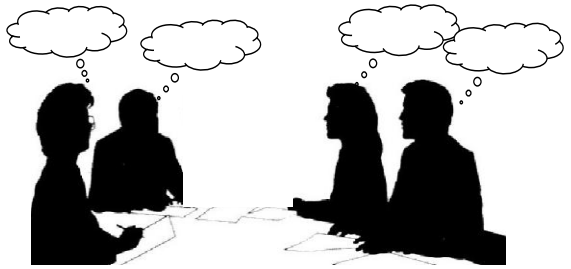
Categories of causes on the Fishbone diagram



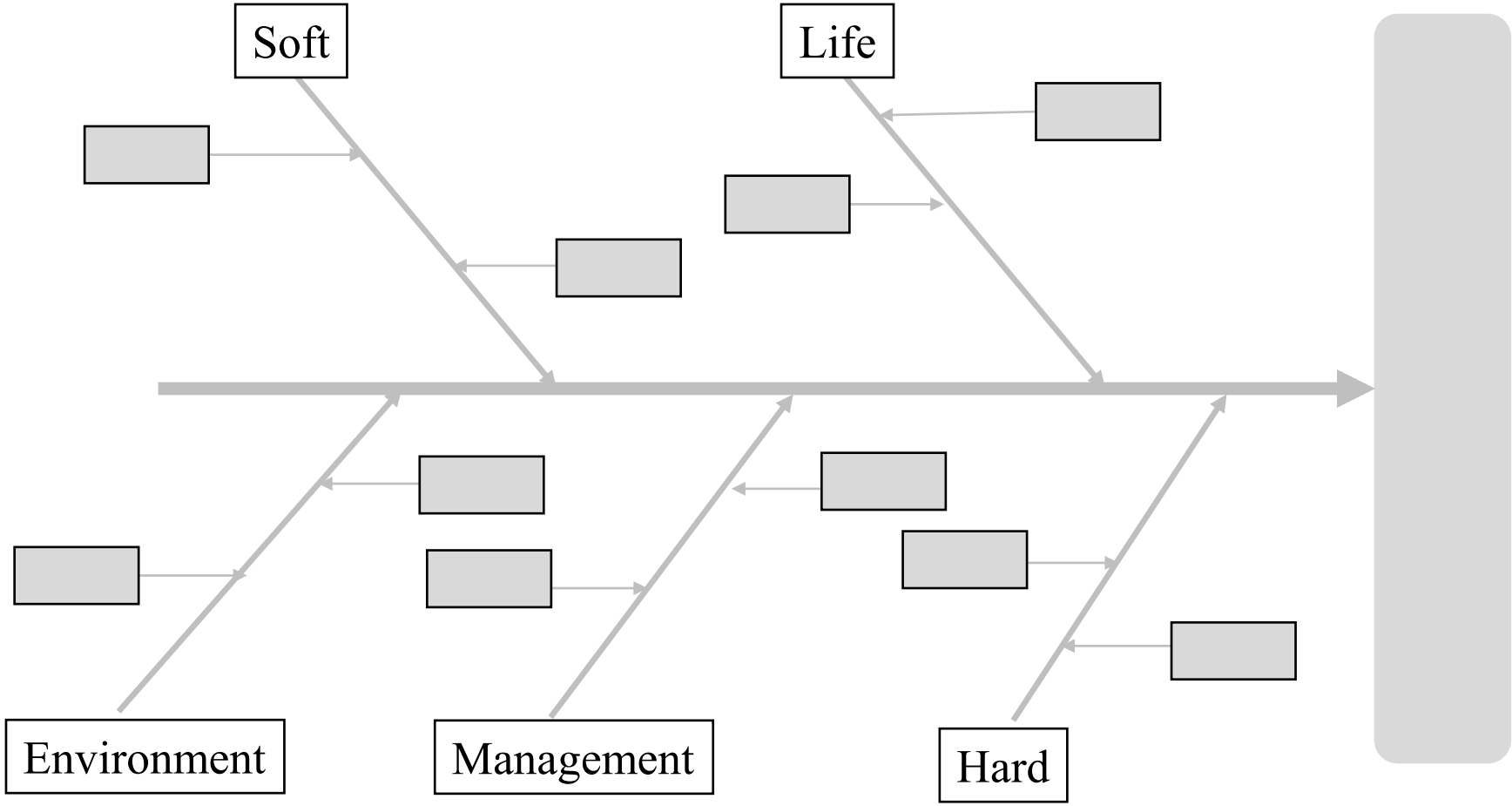
Prepared by Fujita Planning Co., Ltd.

Procedure of Step3
②③ identification of “possible causes of the effect”

- Brainstorm as many “possible causes of the effect” as you can and list them.
- Categorize the identified “possible causes of the effect” through consensus among the WIT members.
- Note: If similar causes are raised by different team members, merge those similar “possible causes” and then categorize them.



Categorization of identified “possible causes of the effect”

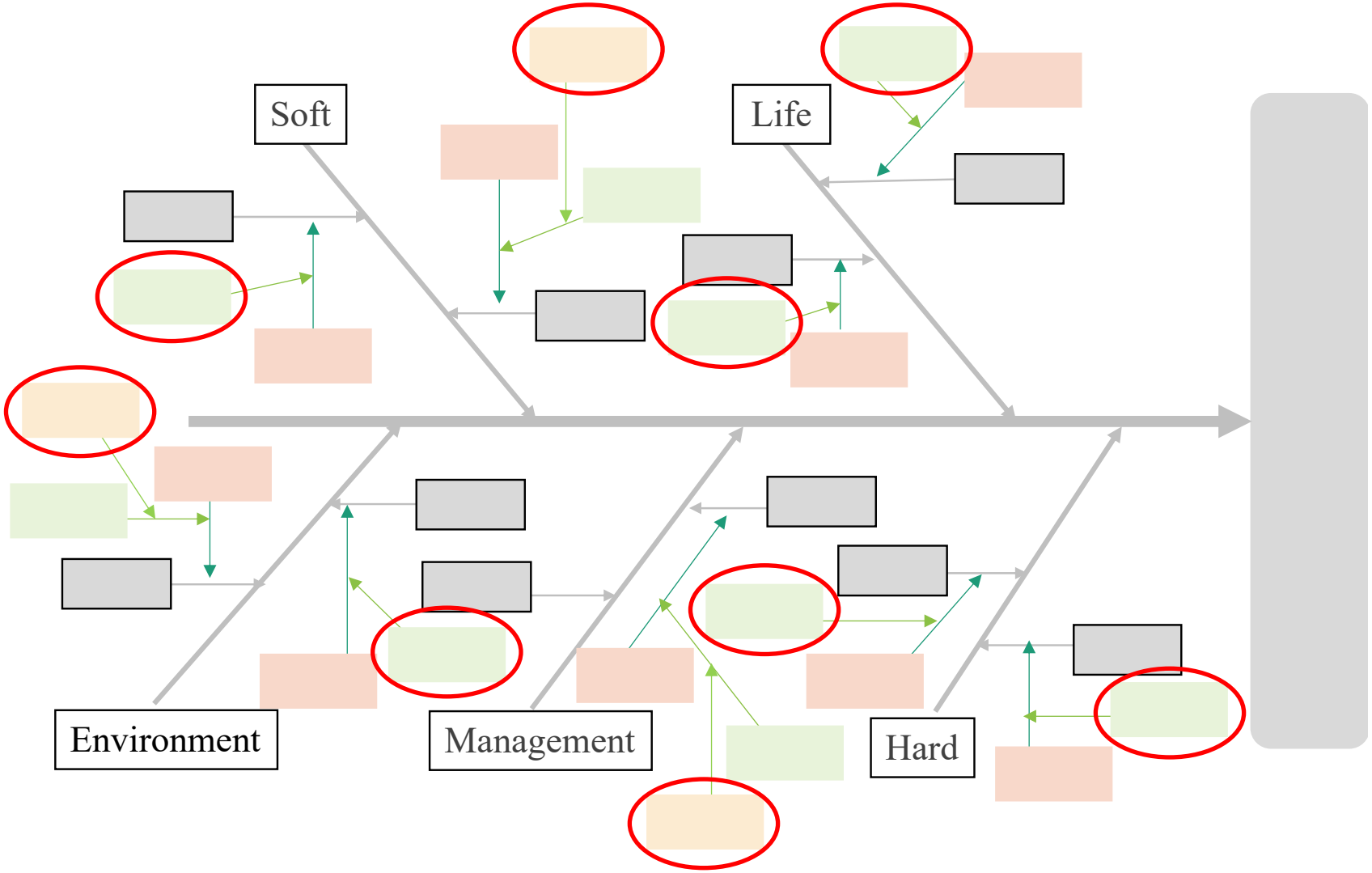


Procedure of Step3
④ ⑤ Root cause analysis

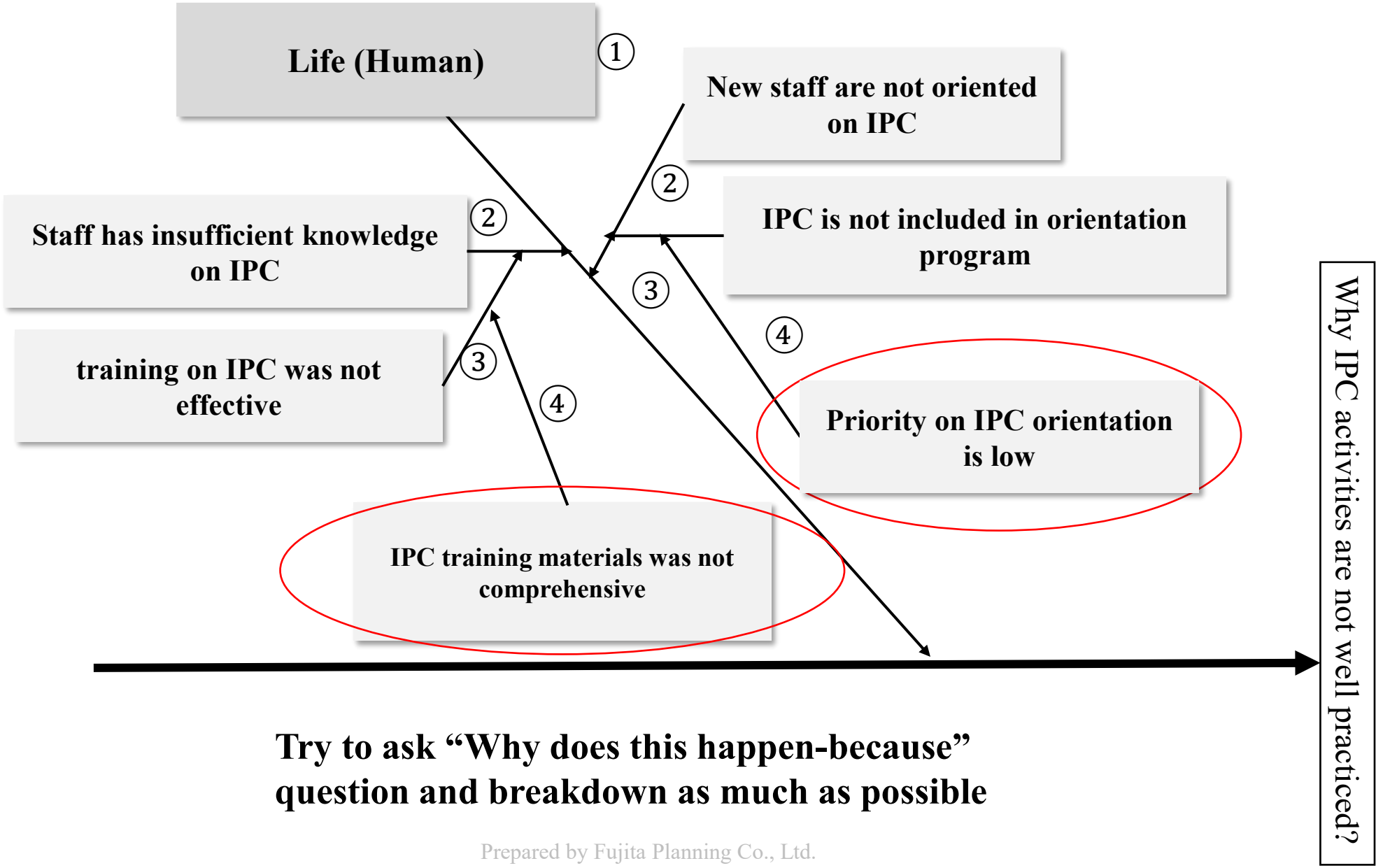
- Start analyzing the root causes.
- Ask “Why does this happen?” for each cause. Write sub-causes branching out from each cause. Continue asking “Why?” to generate deeper levels of causes. The layers of branches show the causal relationships.
- When the group runs out of ideas, focus attention on areas of the chart where there are fewer ideas.
- Put a red circle around the identified root causes for easy recognition.

https://asq.org/quality-resources/fishbone

RCA with why-because questions



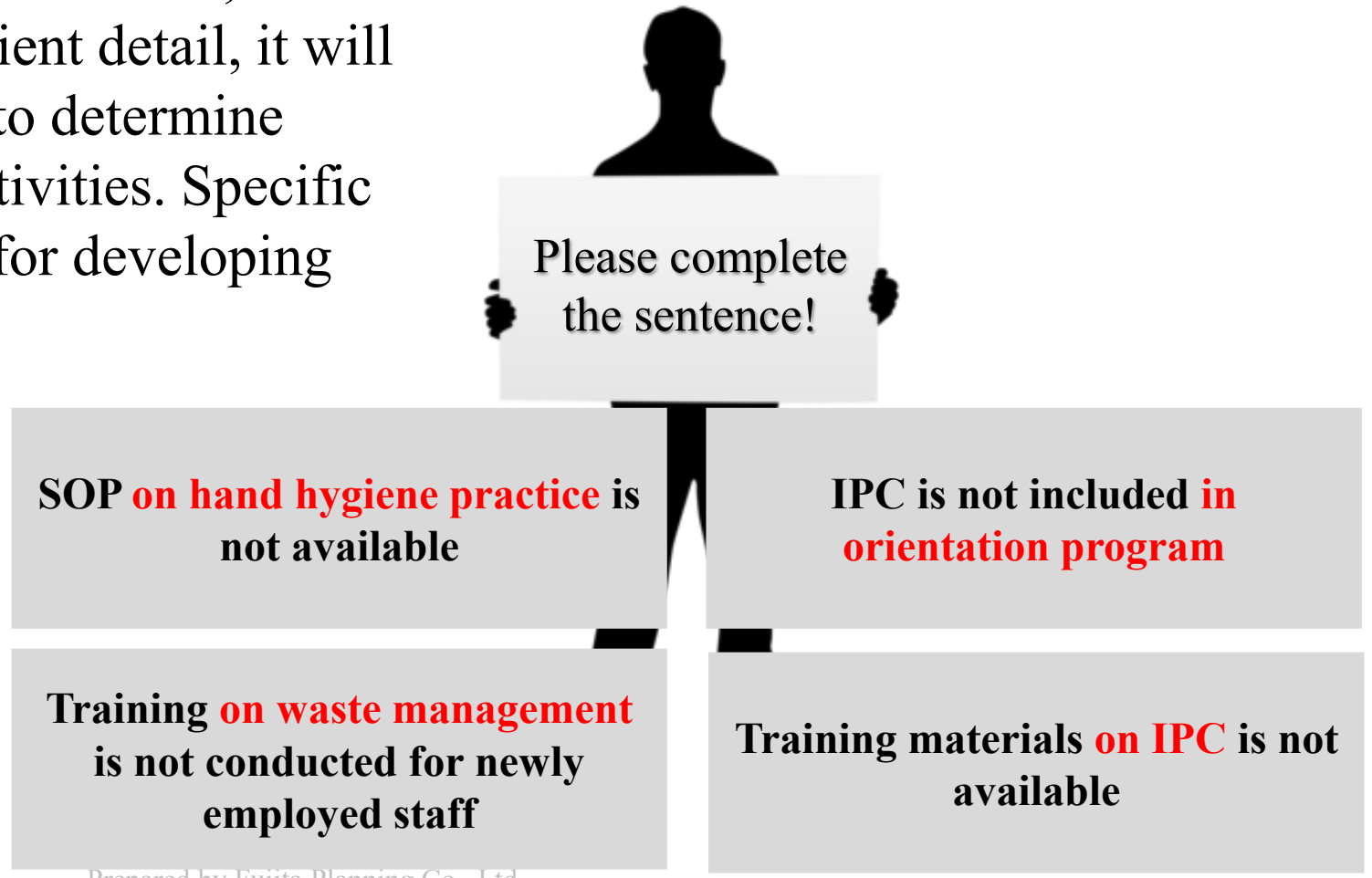
Example of in-depth root cause analysis



Try to ask "Why does this happen-because" question and breakdown as much as possible

“Causes” must be written clearly and correctly

In Step 3, when identifying the root causes, if the causes are not described in sufficient detail, it will become difficult in the next step to determine concrete countermeasures and activities. Specific and detailed causes are essential for developing practical actions.



Tips for making fishbone diagram

- The number of contributing factors that require RCA is equal to the number of identified “vital few” contributing factors in Step 2.
- The “vital few” contributing factors are selected based on the 80:20 rule (Pareto principle).
- A fishbone diagram for RCA must be developed for each “vital few” contributing factor.
- Set the “vital few” contributing factor as the “effect” (the head of the fish), expressed in question form: “Why does this happen?”

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Tips for Root cause analysis

- The “effect” refers to the major contributing factor identified in Step 2, *not* the KAIZEN Theme identified in Step 1.
- A fishbone diagram must be developed for each of the “vital few” contributing factors identified in Step 2.
- Avoid mentioning “shortage of resources”—such as “no money,” “no human resources,” or “no materials”—as possible causes or root causes.
- Avoid making assumptions when identifying causes. Use your experience, knowledge, current conditions, data, and available information.
- Avoid blaming others. Instead, look for causes within your own workplace.

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Self-checklist of Step 3

After completing Step 3, please use the following checklist to ensure that all procedures have been carried out correctly.

Points to check	Self-check
Check whether prioritized problem / contributing factors that were identified in Step 2 is used as a head of Fishbone	Yes / No
Check whether contributing factor in the head of Fishbone Diagram is stated in sentence; Why (the contributing factor) happened?	Yes / No
Check whether “Cause-Effect (Why- Because)” relation is clarified	Yes / No
Check whether “Why-Because” is asked enough to find root causes	Yes / No
Check whether sentence used in the Fishbone Diagram are clearly stated	Yes / No
Check whether all identified root causes are clearly marked with red circle	Yes / No
Check whether “No money”, “No human resource” and “No material” are not identified as a root cause	Yes / No
Check whether Fishbone Diagram is developed for each contributing factor which need to be tackled	Yes / No

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Taiichi Ohno Quotes

Ask 'why' five times about every matter

Taiichi Ohno : 1912 – 1990
Former vice president of TOYOTA Motors
Father of Toyota Production System

Prepared by Fujita Planning Co., Ltd.

Any question, comments, clarification you need?

The 5S-KAIZEN-TQM approach training materials

KAIZEN with QC story
Step 4
“Countermeasures identification”

Japan International Cooperation Agency

Fujita Planning Co., Ltd.

Objectives

At the end of the lecture, the participants will be able

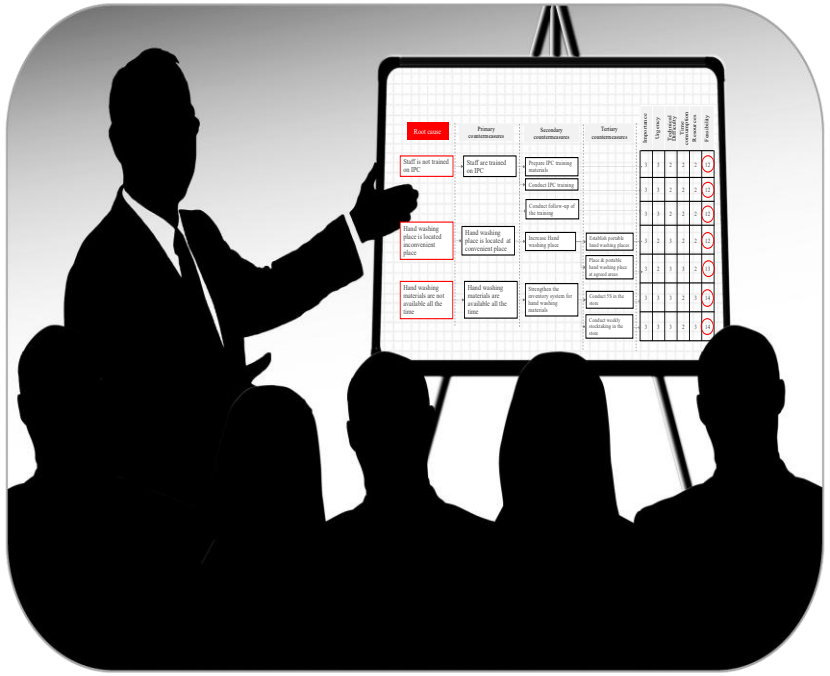
- To understand the overall concept of QC story Step 4
- To explain about how to use/ develop Tree-diagram(QC tool)
- To explain about how to use/ develop Matrix diagram(QC tool)
- To explain about the procedures of QC story Step 4
- To carry out QC story Step 4

Steps for KAIZEN with QC story

Overview of Step 4

Two tasks need to be completed in Step 4:

- Identify countermeasures for each root cause using a tree diagram.
- Check the feasibility of the identified countermeasures using a matrix diagram.



Identification of countermeasure

- In this step, based on the results of the root cause analysis, countermeasures to eliminate each root cause are determined.
- As you proceed, reaffirm the purpose of the KAIZEN theme and ensure that the countermeasures do not conflict with the intended direction or purpose.
- Use a tree diagram to clarify the relationship between each root cause and its corresponding countermeasures

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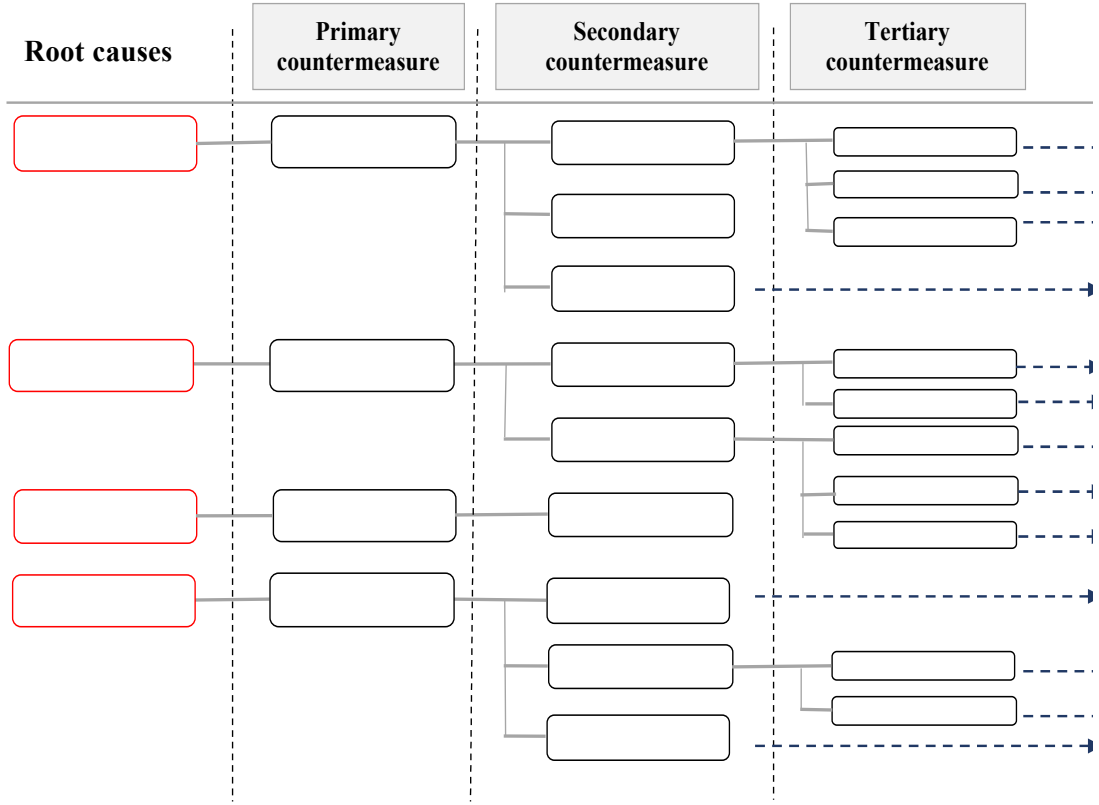
Definition of Tree Diagram



(Image of Tree Diagram)

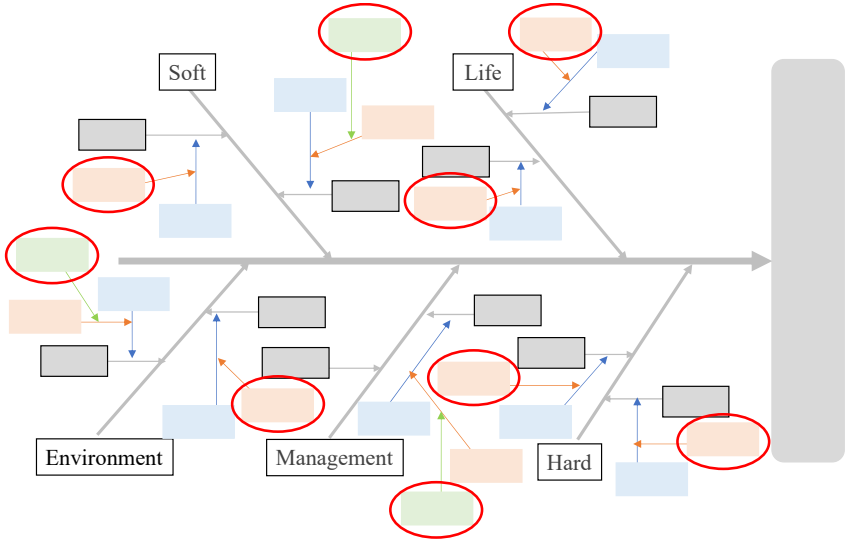
- It is one of the seven QC tools.
- It is used to break down broad categories into increasingly detailed levels.
- A tree diagram helps you move your thinking step by step from general concepts to specific elements.

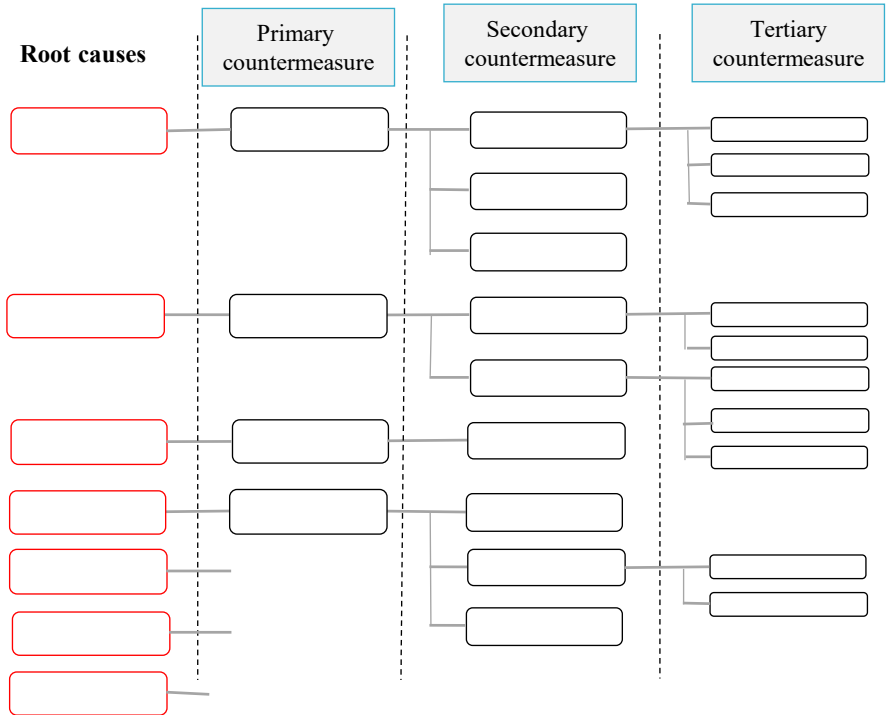
http://asq.org/learn-about-quality/new-management-planning-tools/overview/tree-diagram.html

Prepared by Fujita Planning Co., Ltd.

How to develop Tree Diagram

1. Place **ALL** the identified root causes in Step 3 on the left ends of Tree diagram





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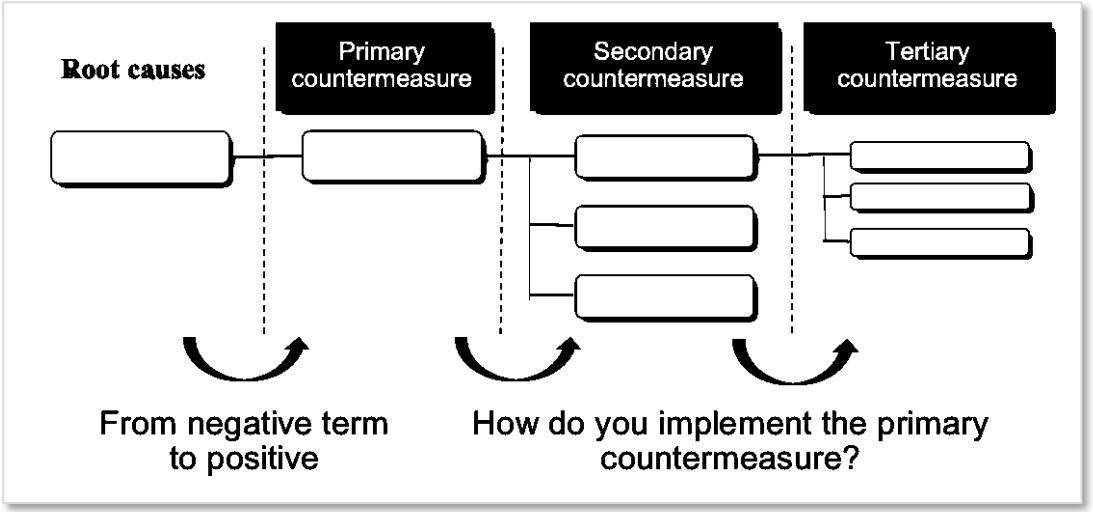
How to develop Tree Diagram

2. Brainstorm countermeasures for each root cause:
   • **Primary (first-line) countermeasure:** Describe each root cause in positive terms to help identify the primary countermeasures.
   • **Secondary (second-line) countermeasure:** Break down the primary countermeasures into specific activities.
   • **Tertiary (third-line) countermeasure:** If necessary, further break down the secondary countermeasures into more detailed activities.



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Feasibility check

- The feasibility check takes major health-service–related factors into account during evaluation. These factors may include operational feasibility within the facility, technical requirements, staff workload and scheduling considerations, and other context-specific elements. In addition, the feasibility check helps ensure that the planned quality-improvement activities can be completed successfully within the available resources.
- This check is conducted before implementing the countermeasures, as it provides an indication of whether the proposed countermeasures are realistic and achievable in the healthcare setting.
  Use the matrix diagram (one of the seven QC tools) to assess the feasibility of the identified countermeasures

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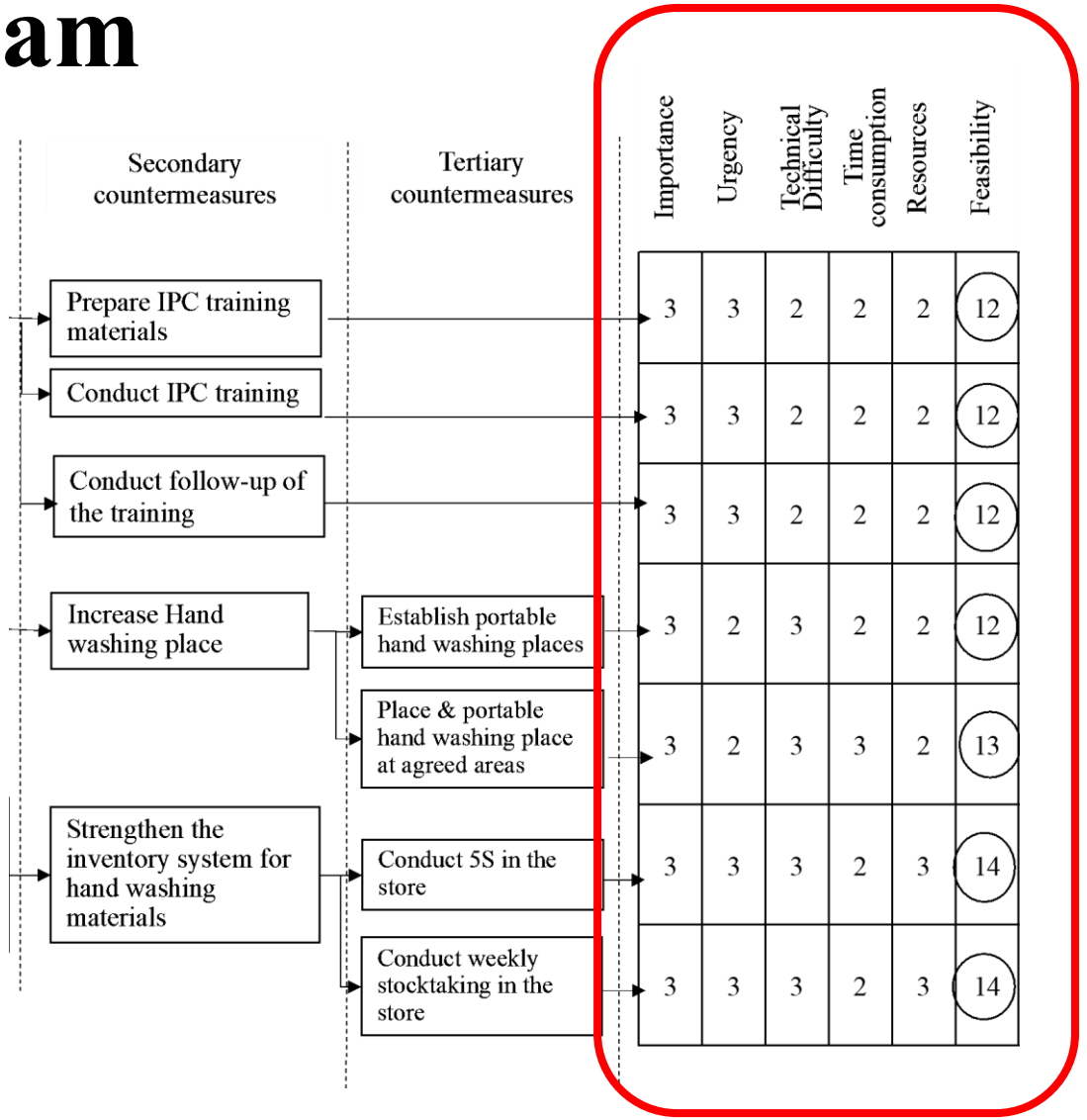
Definition of Matrix Diagram

- It is one of the QC tools used to illustrate the critical relationships between two or more groups.
- It can also be enhanced to show additional details, such as the strength of the relationships or different aspects of those relationships



http://www.sixsigmadaily.com/tag/matrix-diagram/

Prepared by Fujita Planning Co., Ltd.

Check feasibility of identified countermeasures with Matrix diagram (1)

Each identified countermeasure (activity) needs to be assessed for its feasibility.

- The items used for the feasibility check can be adjusted depending on the situation.
- The feasibility of each countermeasure is evaluated based on the following items;

Items for feasibility check	What should be checked
Importance	• What positive impact is expected from implementing this countermeasure? • Are there any potential negative impacts?
Urgency	• How soon does this countermeasure need to be implemented?
Technical Difficulty	• Is it technically easy to implement this countermeasure?
Time consumption	• How long does it take to implement this countermeasure?
Resources availability	• Are the necessary resources (human, material, and financial) available for implementing the countermeasures?

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Check feasibility of identified countermeasures with Matrix diagram (2)

- A measurement scale and a “cut-off line” need to be established for the feasibility check.
- Place a red circle on the scores that are above the cut-off line. This will indicate which countermeasures should be implemented

How to calculate the feasibility score

Scales for feasibility	
3	High priority, Easy to do
2	Moderate
1	Low priority, Difficult to do

- 5 items for feasibility check, it means full mark is 15 for each activity.
- If cut offline is set **as 70%,** 15 x 0.7 = 10.5 Therefore, countermeasures which are scored 11 and above will be implemented.

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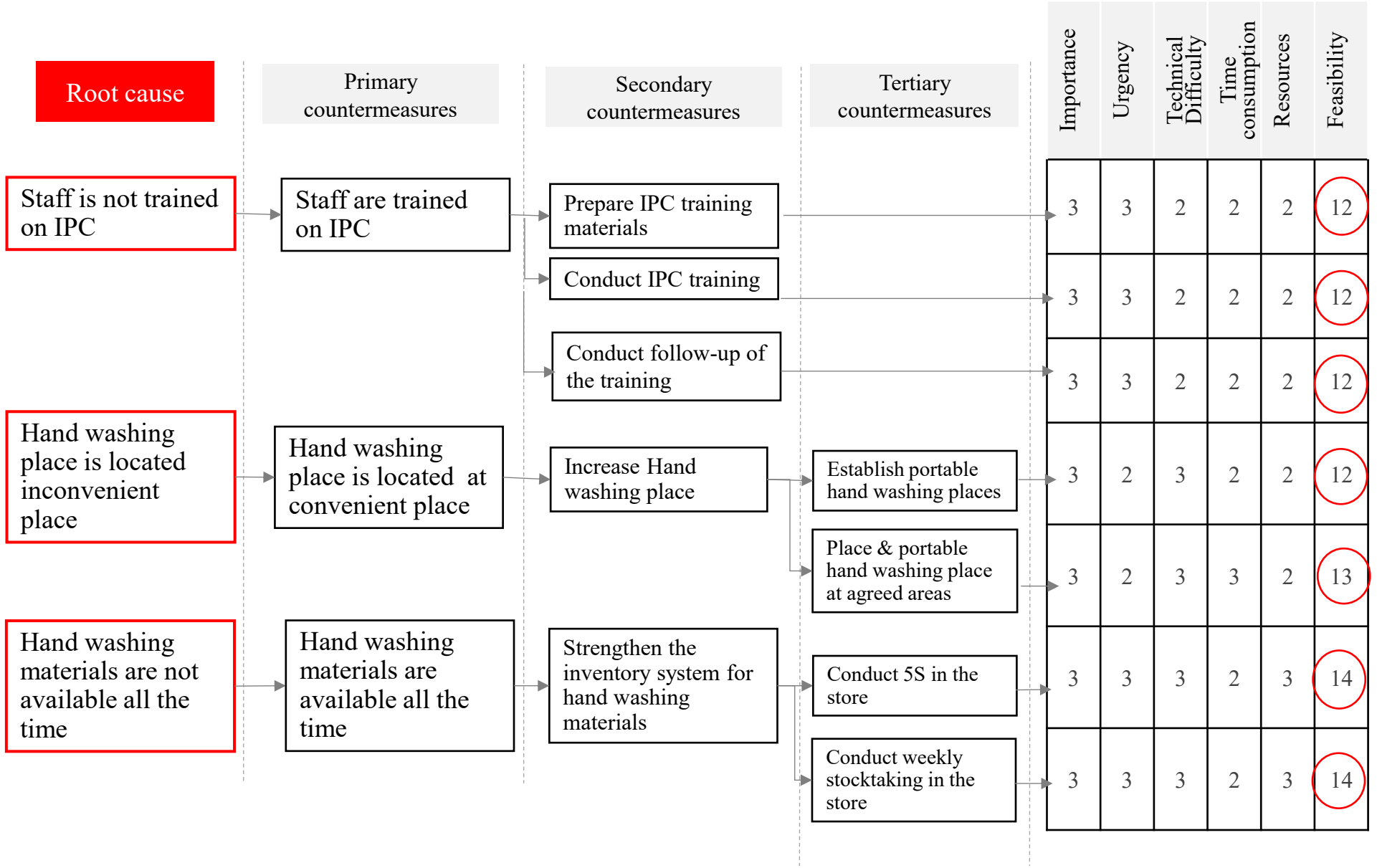
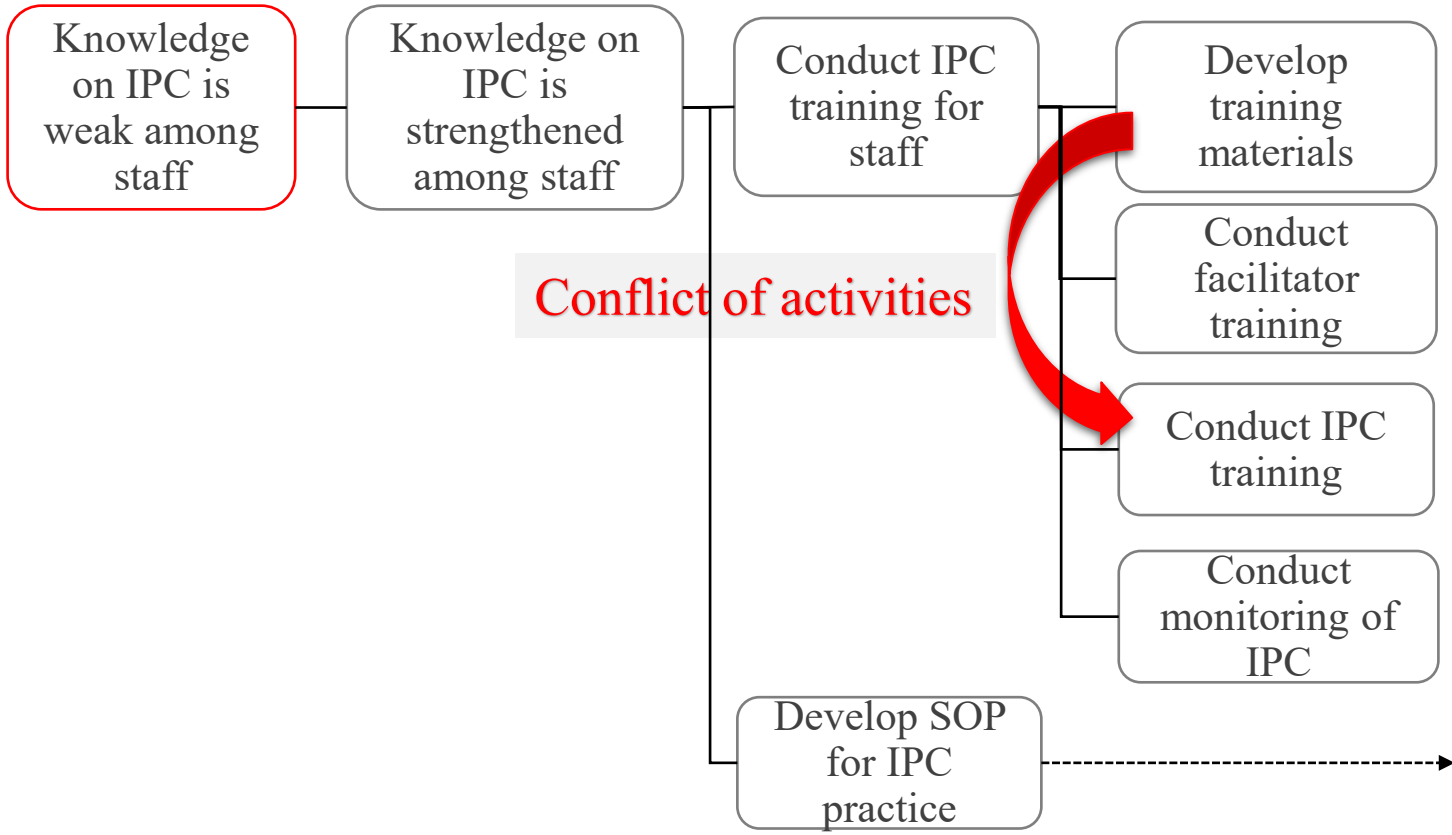
Example of Countermeasure identification



cut-off line=70% (11 and above will be accepted)
Scale:
3= high priority, easy to implement
2= middle level priority
1= low priority, difficult to implement

Check conflict of activities among identified countermeasures

e.g. "Develop training material" is not feasible, but "Conduct training" is feasible…. Is it possible to conduct training without training materials?



	Importance	Urgency	Technical Difficulty	Time consumption	Resource availability	Feasibility check score
Develop training materials	3	2	2	1	1	10
Conduct facilitator training	3	2	2	2	2	11
Conduct IPC training	3	3	2	2	2	12
Conduct monitoring of IPC	3	1	2	2	3	11
Develop SOP for IPC practice	3	2	2	2	2	11

Tips for identification of countermeasures

- Reflect all identified root causes from Step 3.
- If the root causes are not thoroughly explored in Step 3, it will be difficult to identify appropriate countermeasures.
- First, identify countermeasures that can be implemented within your own section.
- Clearly write the following next to the diagrams:
  - The scale used for the feasibility check
  - The cut-off score or percentage for the feasibility check
- Consider the effective use of available resources; avoid adding or increasing resource requirements unnecessarily

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Self-checklist for Step 4

After completing Step 4, please use the following checklist to ensure that all procedures have been carried out correctly.

Points to check	Self-check
Check whether all the identified root causes in Step 3 is reflected in Tree Diagram	Yes / No
Check whether detailed countermeasures are identified; breakdown of countermeasures by the level of countermeasures	Yes / No
Check whether there are any conflicts among the activities of the identified countermeasures.	Yes / No
Check whether feasibility is appropriately done; Check the relation among the identified countermeasures against a root cause	Yes / No
Check whether the scale and cut-off line of feasibility check are clarified	Yes / No

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Any question, comments, clarification you need?

The 5S-KAIZEN-TQM approach training materials

KAIZEN with QC story
Step 5
“Countermeasures implementation”

Japan International Cooperation Agency

Fujita Planning Co., Ltd.

Objectives

At the end of the lecture, the participants will be able

- To understand the overall concept of QC story Step 5
- To explain about Action plan development for implementation of countermeasures
- To explain about the procedures of QC story Step 5
- To explain about how to develop Action plan with 5W1H
- To explain about how to keep records about any changes
- To carry out QC story Step 5

Steps for KAIZEN with QC story

“Problem solving type”

Standardization

Effectiveness check

Countermeasure implementation

To implement the identified countermeasures in Step 4 to tackle with the identified root cause

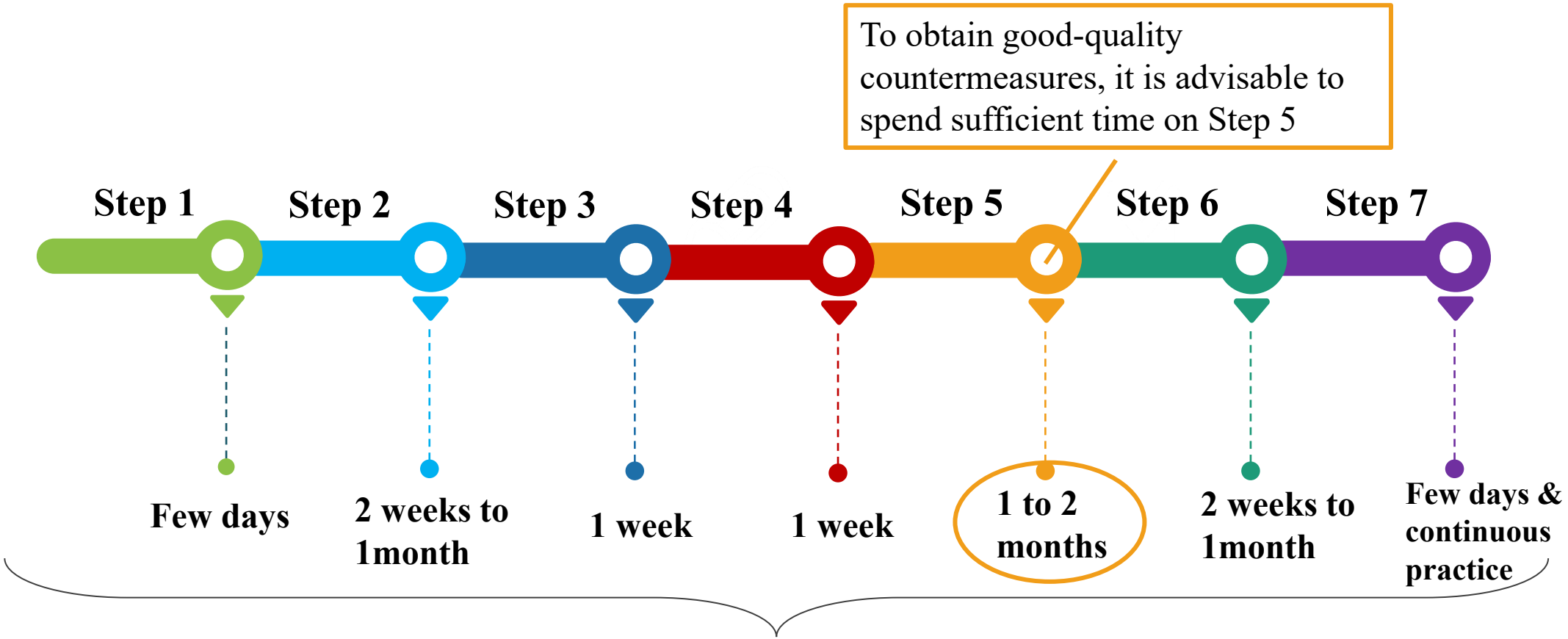
Countermeasure identification

Root cause analysis

Situation analysis

KAIZEN Theme selection

Time allocation of each step in QC story



Appropriate time allocation for whole process of QC story is within **6 months**

Step 5 as “Planning & implementation of countermeasures

Start taking actions to remove the root causes with all staff

- To develop a clear action plan using the 5W1H approach
- To promote participation of all staff in the workplace
- To implement the identified countermeasures
- To follow the plan and conduct self-monitoring of the activities

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From Step 4 to Step 5

Countermeasures	Importance	Impact	Difficulty	Time	Resource	Feasibility check score
xxxxx	3	2	2	2	3	12
xxxxx	2	2	2	2	2	10
xxxxx	3	2	2	2	2	11
xxxxx	3	3	2	2	2	12

Countermeasures	Who	What	Where	When	Why	How

Take all countermeasures that are identified as “feasible” in Step 4

- Develop implementable Action plan with 5W1H
- Implement identified countermeasures, and monitor a progress of the actions

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Why use “5W1H” for the action plan ?

Developing an action plan using the “5W1H” approach will help to:

- Define the specific actions required to implement the countermeasures
- Clearly describe the necessary tasks so that section staff can understand and carry them out easily
- Align staff members with a shared purpose in implementing KAIZEN activities
- Simplify progress monitoring for the implementation of countermeasures

Prepared by Fujita Planning Co., Ltd.

The 5W and 1H of KAIZEN

***3-Mu's: Muri, Mura, Muda**

WHO	WHEN	WHERE
• Who does it? • Who is doing it? • Who should be doing it? • Who else can do it? • Who else should do it? • Who is doing 3-Mu's	• When to do it? • When is it done? • When should it be done? • What other time can it be done? • What other time should it be done? • Are there any time	• Where to do it? • Where is it done? • Where should it be done? • Where else can it be done? • Where else should it be done? • Where are 3-Mus' being
WHAT	**WHY**	**HOW**
• What to do? • What is being done? • What should be done? • What else can be done? • What else should be done? • What 3-Mu's are being done?	• Why do we do it? • Why do it? • Why do it there? • When do it then? • Why do it that way? • Are there 3-Mu's in the way of thinking	• How to do it? • How is it done? • How should it be done? • Can this method be used in other areas? • Is there any other way to do it? • Are there any 3-Mu's in the method?

Prepared by Fujita Planning Co., Ltd.

How to implement Step 5

① Prepare action plan format with 5W1H format, monitoring checklist for progress check and tangible effect observation of implemented countermeasures

(Example of Action plan format)

Countermeasures	**Who**	**What**	**Where**	**When**	**Why**	**How**	**Progress monitoring**				**Any changes observed during the implementation of countermeasures**
							1st monitoring Date and status		2nd monitoring Date and status		

How to implement Step 5

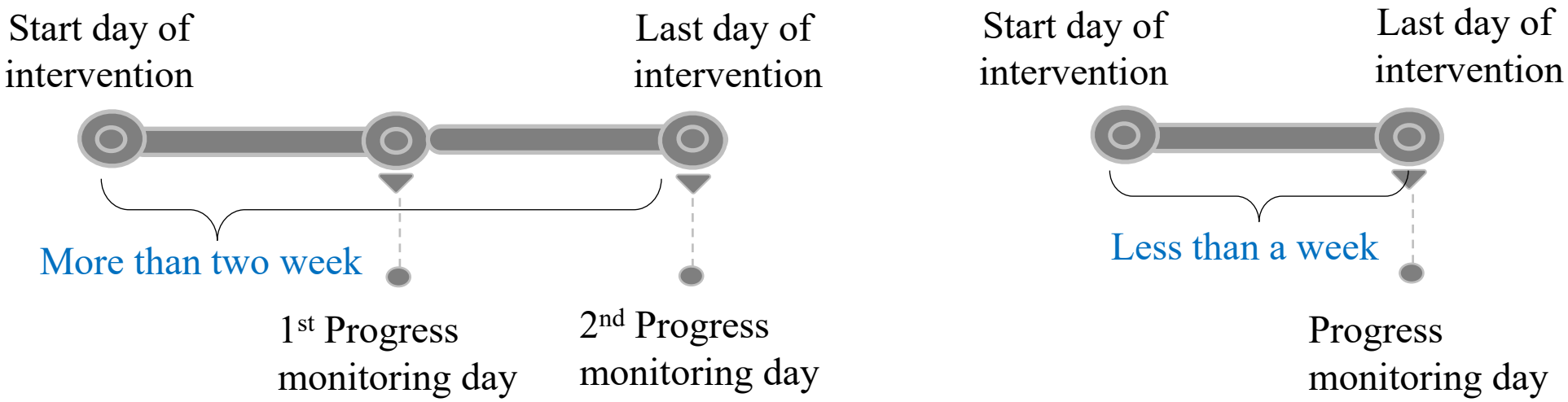
② Place ALL countermeasures identified as a feasible measure in Step 4 on the left end of the action plan table.

③ Brainstorm detailed plan for each countermeasure and schedule the date of progress monitoring.

Countermeasures	**Who**	**What**	**Where**	**When**	**Why**	**How**	**Progress monitoring**				**Any changes observed during the implementation of countermeasures**
							1st monitoring Date and status		2nd monitoring Date and status		
SOP for waste management is developed	Ward in-charge	Develop SOP on waste management	At ward	By the end of June	For improvement of waste management at female found	By formulating the task team to develop SOP					
Staff orientation on waste management is conducted	WIT members	Conduct orientation on waste management	At ward Meeting room	By the first week of July	To increase knowledge on KAIZEN step 2	By Using Continuous Professional Education session					

Setting the Progress monitoring date

- The start date of Step 5 must be recorded.
- If the implementation of the countermeasures lasts more than two weeks, set progress-monitoring dates for both the midpoint and the end of the implementation period.
- If the implementation lasts less than one week, set the progress-monitoring date at the end of the implementation period.



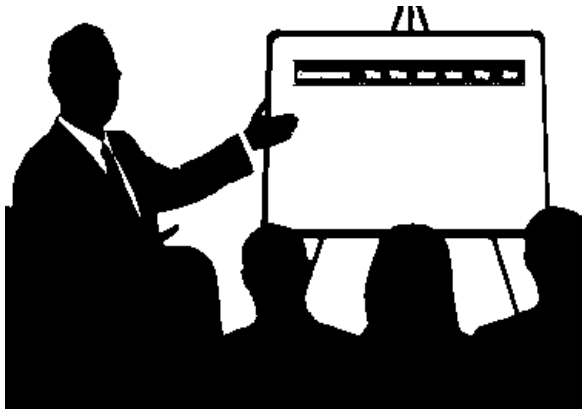
Progress monitoring record

- Progress monitoring should be documented using the following codes:
  - G – Good progress
  - D – Delay in implementation
  - N – Not implemented
- Date of the progress monitoring must be recorded together with the status

Countermeasures	Who	What	Where	When	Why	How	Progress monitoring				Any changes observed during the implementation of countermeasures
							1st monitoring Date and status		2nd monitoring Date and status		

How to implement Step 5

④ Add a column at the right end of the action plan to record all changes and improvements observed during the implementation of countermeasures in Step 5.
⑤ Reach a consensus on the action plan within the department/section.
⑥ Share the action plan with all staff working in the department/section as well as with the QIT.
⑦ Start implementing the countermeasures according to the action plan



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How to implement Step 5

Monitor the progress of implementation

⑧ Follow the action plan and use the checklist to monitor progress. The status of each action should be classified as:

- Properly implemented
- Delayed implementation: re-plan and proceed with implementation
- Not implemented: clarify the reasons for non-implementation

Record any changes and improvements

⑨ Record any improvements in teamwork, communication, or positive influence on other sections observed during Step 5.

⑩ At the end of Step 5, record whether any tangible effects of the countermeasures were observed.

Note: Recording all changes and improvements is essential for assessing the effectiveness o the KAIZEN activities in Step 6

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Tips for successful Step 5

- Reconfirm whether all countermeasures can be implemented within your own section.
- Do not write only “in-charge” in the “WHO” column when developing the action plan.
- Share the action plan with all staff in the section in order to:
  - Promote smooth involvement
  - Keep staff reminded of the implementation
  - Record all changes and improvements observed during the implementation of Step 5

Prepared by Fujita Planning Co., Ltd.

Self-checklist of Step 5

Upon completion of Step 5, use the checklist below to verify that all required procedures have been properly implemented.

Points to check	Self-check
Check whether all countermeasures identified are possible to carried out within the section/unit	Yes / No
Check whether all feasible countermeasures are reflected in the action plan	Yes / No
Check whether the action plan are developed based on “5W1H”	Yes / No
Check whether monitoring checklist is developed	Yes / No
Check whether appropriate timing is given to implement all countermeasures	Yes / No

Prepared by Fujita Planning Co., Ltd.

Any question, comments, clarification you need?

The 5S-KAIZEN-TQM approach training materials

KAIZEN with QC story
Step 6
“Effectiveness check”

Japan International Cooperation Agency

Fujita Planning Co., Ltd.

Objectives

At the end of the lecture, the participants will be able

- To understand the overall concept of QC story Step 6
- To explain about how to compare the before KAIZEN and after KAIZEN
- To explain about the procedures of QC story Step 6
- To explain about how to develop calculation table and Pareto chart (QC tool)
- To carry out QC story Step 6

Steps for KAIZEN with QC story

Effectiveness check

This step is to evaluate the effectiveness of the implemented countermeasures and to determine whether the major contributing factors have been resolved

Standardization

Countermeasure implementation

Countermeasure identification

Root cause analysis

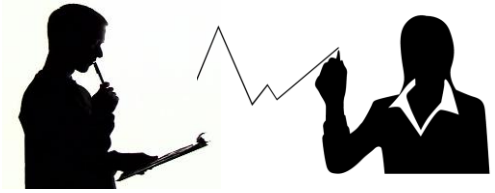
Situation analysis

KAIZEN Theme selection

Need to measure the effectiveness of your KAIZEN

After KAIZEN

At the time of data collection in Step 6



Before KAIZEN

At the time of data collection in Step 2

Expected to see the improvement

- ✓ Need to check the degree of improvement
- ✓ Changes in the frequency of contributing factors (= occurrence of the problem)
- ✓ Changes in the Characteristic value
- ✓ Any other effect: intangible effect, ripple effect

Facing problems

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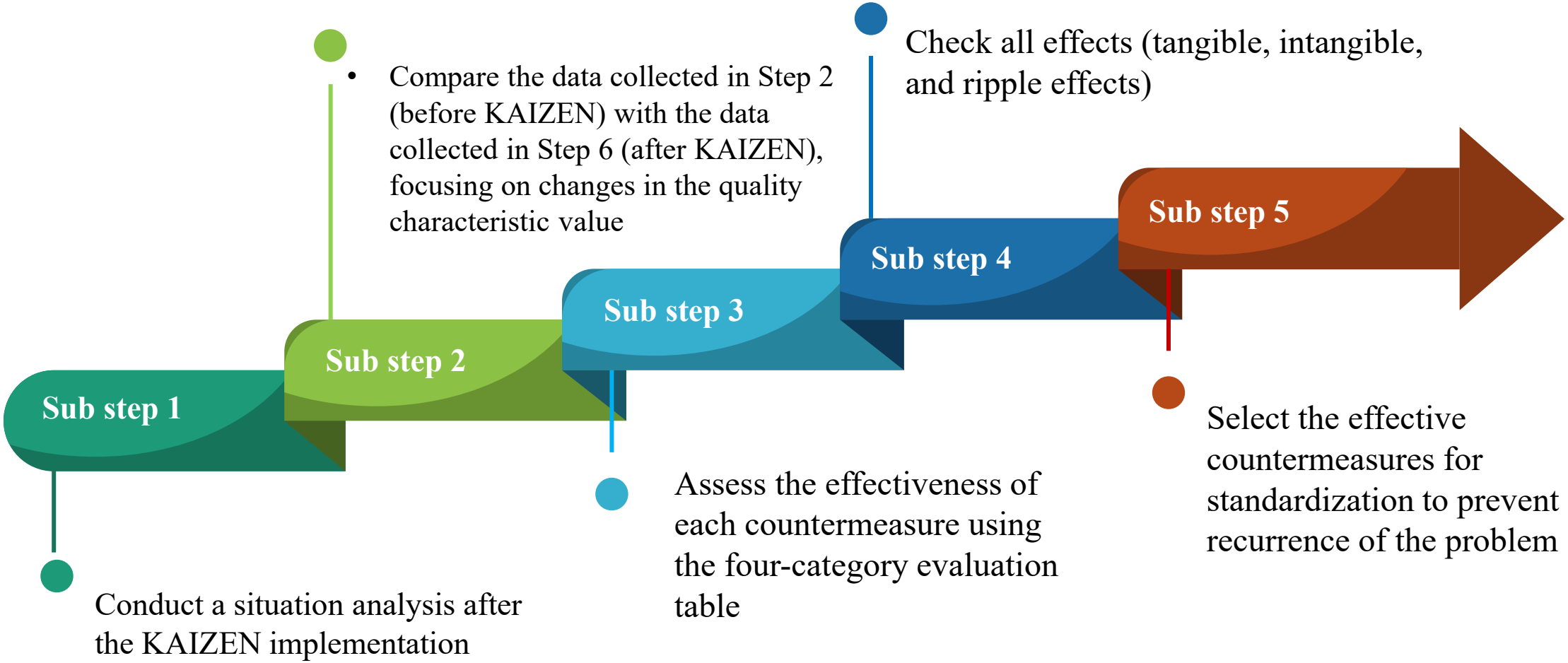
Outline of Step 6



How to implement Step 6

Sub step 1

Conduct the situation analysis using the same methods, tools, and data-collection period that were applied in Step 2. This includes:

- **Collecting data on contributing factors** to determine the frequency of occurrences after KAIZEN.
- **Collecting data on the Quality Characteristic Value (QCV)** to measure changes and improvements.

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How to implement Step 6

Sub step 2

Make a comparison between the data collected “before KAIZEN” (Step 2) and “after KAIZEN” (Step 6).
This includes:

- Developing a Pareto chart to compare the frequency of occurrence of contributing factors.
- Checking the change in the Quality Characteristic Value (QCV) before and after KAIZEN.

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Comparison calculation table

#	Contributing factors	Before KAIZEN			After KAIZEN			Reduction rate (%)
		FRQ	CF	AR (%)	FRQ	CF	AR (%)	
1	Number of giving wrong injectable medicines	25	25	46.3	7	7	46.7	72.0
2	Number of giving wrong inhale medicines	16	41	75.9	4	11	73.3	75.0
3	Number of giving wrong oral medicines	6	47	87.0	3	14	93.3	50.0
4	Number of giving wrong volume of insulin	5	52	96.3	1	15	100	80.0
5	Number of giving wrong ointment	2	54	100	0	15	100	100.0
Total		**54**	**-**	**-**	**15**	**-**	**-**	**72.2**

FRQ: Frequency
CF: Cumulative frequency
AR%: Accumulation ratio (%)

$$\text{Reduction rate} = \frac{(\text{Frequency of before KAIZEN}) - (\text{Frequency of after KAIZEN})}{(\text{Frequency of before KAIZEN})} \times 100$$

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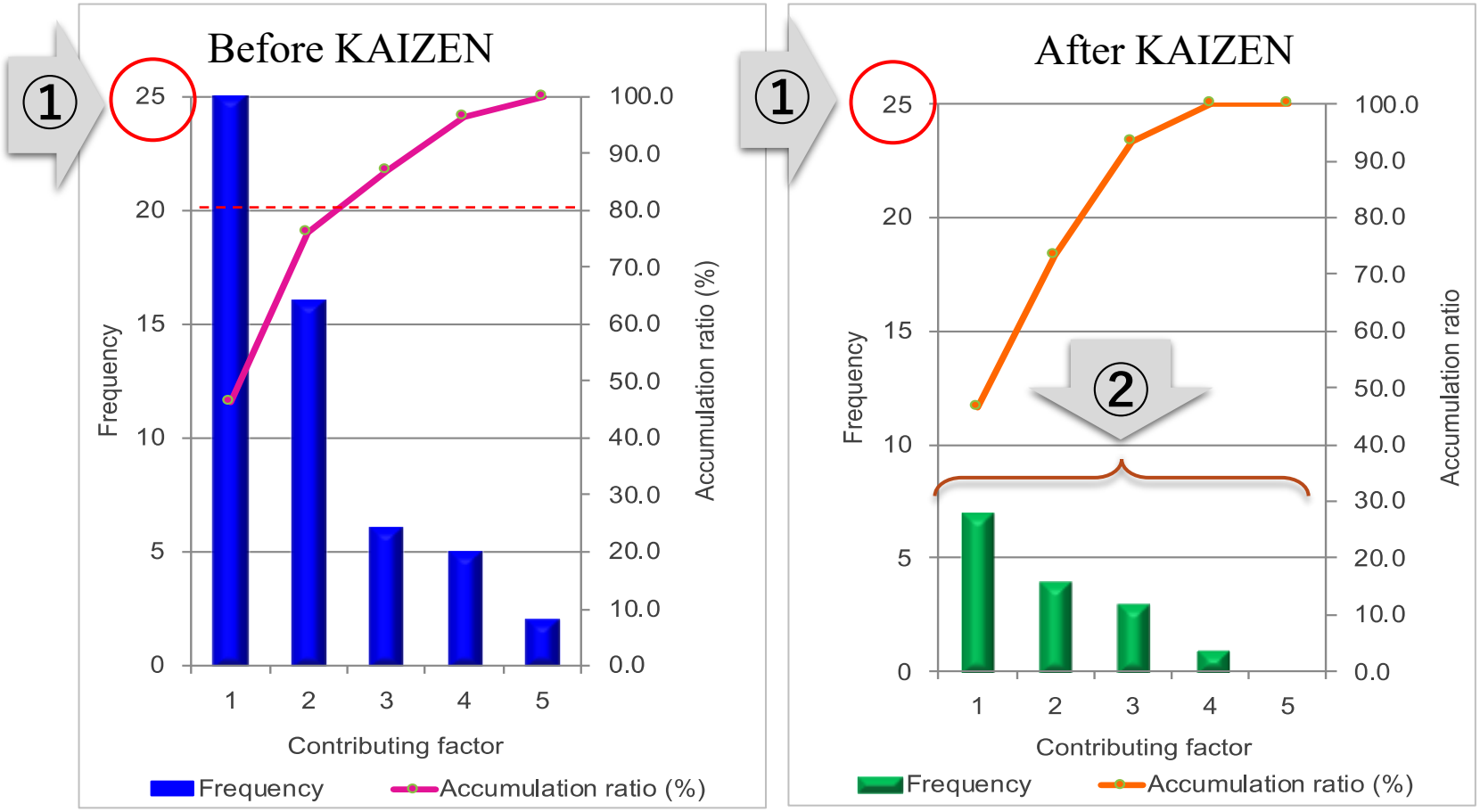
Comparison of Pareto chart



①Maximum number on the axis of frequency matches to ”Before”

②Order of. Contributing factor is same between Before and After: even if the descending order of contributing factors is changed.

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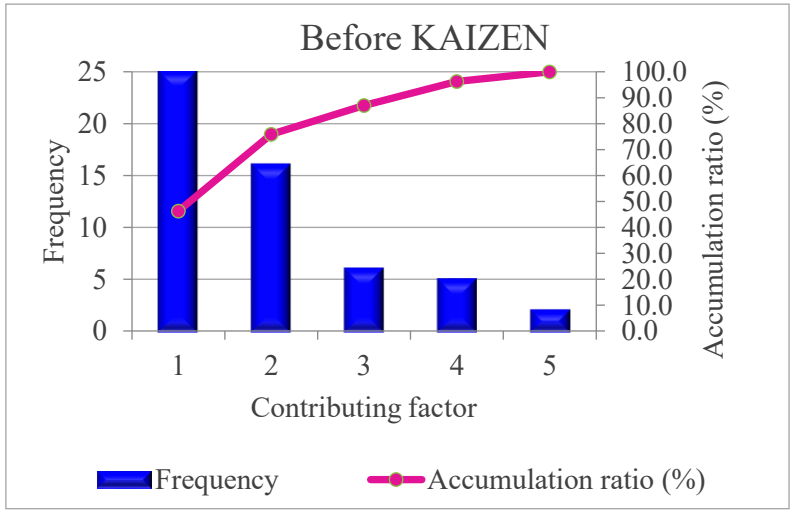
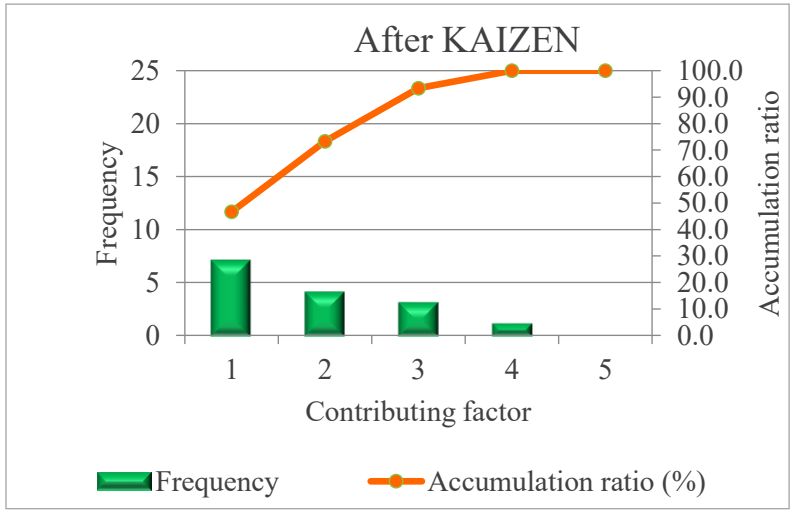
Comparison results between before and after KAIZEN

#	Contributing factors	Before KAIZEN			After KAIZEN			Reduction rate (%)
		FRQ	CF	AR (%)	FRQ	CF	AR (%)	
1	Number of giving wrong injectable medicines	25	25	46.3	7	7	46.7	72.0
2	Number of giving wrong inhale medicines	16	41	75.9	4	11	73.3	75.0
3	Number of giving wrong oral medicines	6	47	87.0	3	14	93.3	50.0
4	Number of giving wrong volume of insulin	5	52	96.3	1	15	100	80.0
5	Number of giving wrong ointment	2	54	100	0	15	100	100.0
	Total	**54**	-	-	**15**	-	-	**72.2**





Purpose of Pareto chart comparison

The purpose of creating a Pareto chart based on the situation analysis in Step 6 is different from that in Step 2. The purposes are as follows:

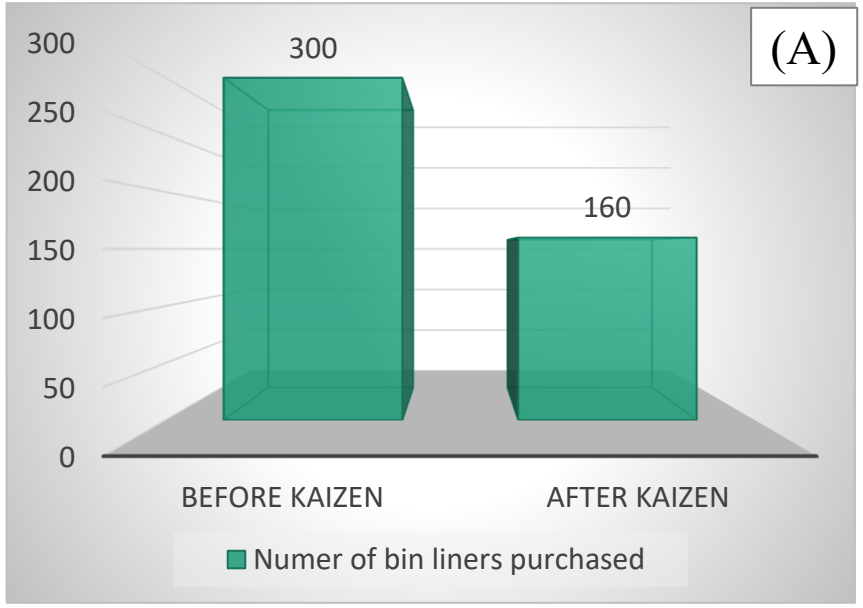
- To visualize the changes for better understanding of the results
- To check the changes and impacts in the factors contributing to the KAIZEN theme (problem) after the intervention
- To obtain hints for selecting the next KAIZEN theme

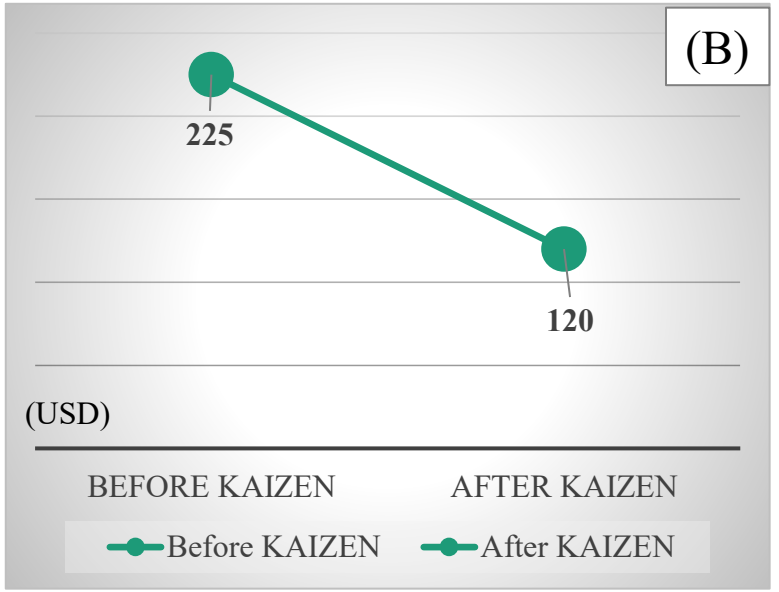
Comparison of “Quality characteristic value (QCV)

- Measure the QCV after KAIZEN and compare it with the QCV before KAIZEN to assess the impact of your KAIZEN activities.

(Example)

- KAIZEN theme is “Waste segregation is improved” and two QCV was identified in Step 2
  - (A) Number of bin liners procured
  - (B) Procurement cost of bin liners





Visualize the comparison results will be impressive for every one.

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How to implement Step 6

Sub step 3

Verify the effectiveness of each measure implemented in Step 5.

- Observe and record any changes that occurred during the implementation of countermeasures in Step 5.
- Verify and record the tangible effects of each countermeasure implemented in Step 5.
- Based on the above records, categorize all countermeasures into the four categories.

		Effectiveness	
		Effective	**Not effective**
Implementation	**Countermeasure implemented**	Group ①	Group ②
	Countermeasure NOT implemented	Group ③	Group ④

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4 BOX Table for effectiveness check

Sub step 3

	Effective	**Not effective**
Countermeasures implemented	**Group ①** Based on the observations made during Step 5, identify the countermeasures that were implemented and judged as "effective".	**Group ②** Based on the observations made during Step 5, identify the countermeasures that were implemented and judged as "NOT effective".
Countermeasures NOT implemented	**Group ③** Based on the observations made during Step 5, identify the countermeasures that were not implemented or were incomplete but were still judged as "effective".	**Group ④** Based on the observations made during Step 5, identify the countermeasures that were not implemented and were judged as "NOT effective"

Note: Countermeasures may cause negative effects. If negatives outweigh positives, the countermeasures must be reviewed

How to implement Step 6

Sub step 4

- List all types of effects observed during the implementation of the countermeasures in Step 5. The effects that may be observed include the following:

Type of effect	Meanings	Example
Tangible effect	How much the expected effect and characteristic value was improved	○○ is reduced xx%. ○○minutes were shortened.
Intangible effect	Effects that appeared besides tangible effects	Teamwork is improved, staff motivation is increased, etc.
Ripple effect	Any other influences: positive, negative	(Negative) The work process of Section A is delayed. (Positive) Our KAIZEN was adopted by Section B.

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How to implement Step 6

Sub step 5

- Select the effective countermeasures (Group ①) for standardization in order to prevent recurrence of the problem

		Effectiveness	
		Effective	Not effective
Implementation	Countermeasure implemented	Group ①	Group ②
	Countermeasure NOT implemented	Group ③	Group ④

Step 7: Standardization

Self-checklist of Step 6

After completing Step 6, please use the following checklist to ensure that all procedures have been carried out correctly.

Points to check	Self-check
Check whether all necessary data is collected for effectiveness check or not; same methodology and period applied in Step 2	Yes / No
Check whether comparison table for effectiveness check is developed or not; Frequency before and after KAIZEN, cumulative number frequency before and after KAIZEN, Cumulative ratio before and after are appropriately calculated or not in the comparison table	Yes / No
Pareto Charts for before and after KAIZEN are developed based on the comparison table or not; Scale of frequency, Cumulative ratio, Plotting points of cumulative ratio	Yes / No
Check whether Pareto Chart is properly developed based on the calculation table or not (Need to check the scale and scale adjustment between before and after the KAIZEN, Plotting point of cumulative ratio, Description of contributing factors)	Yes / No
Check whether effective countermeasures are identified and listed	Yes / No
Check whether ineffective countermeasures are identified and listed	Yes / No

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Any question, comments, clarification you need?

The 5S-KAIZEN-TQM approach training materials

KAIZEN with QC story Step 7 “Standardization”

Japan International Cooperation Agency

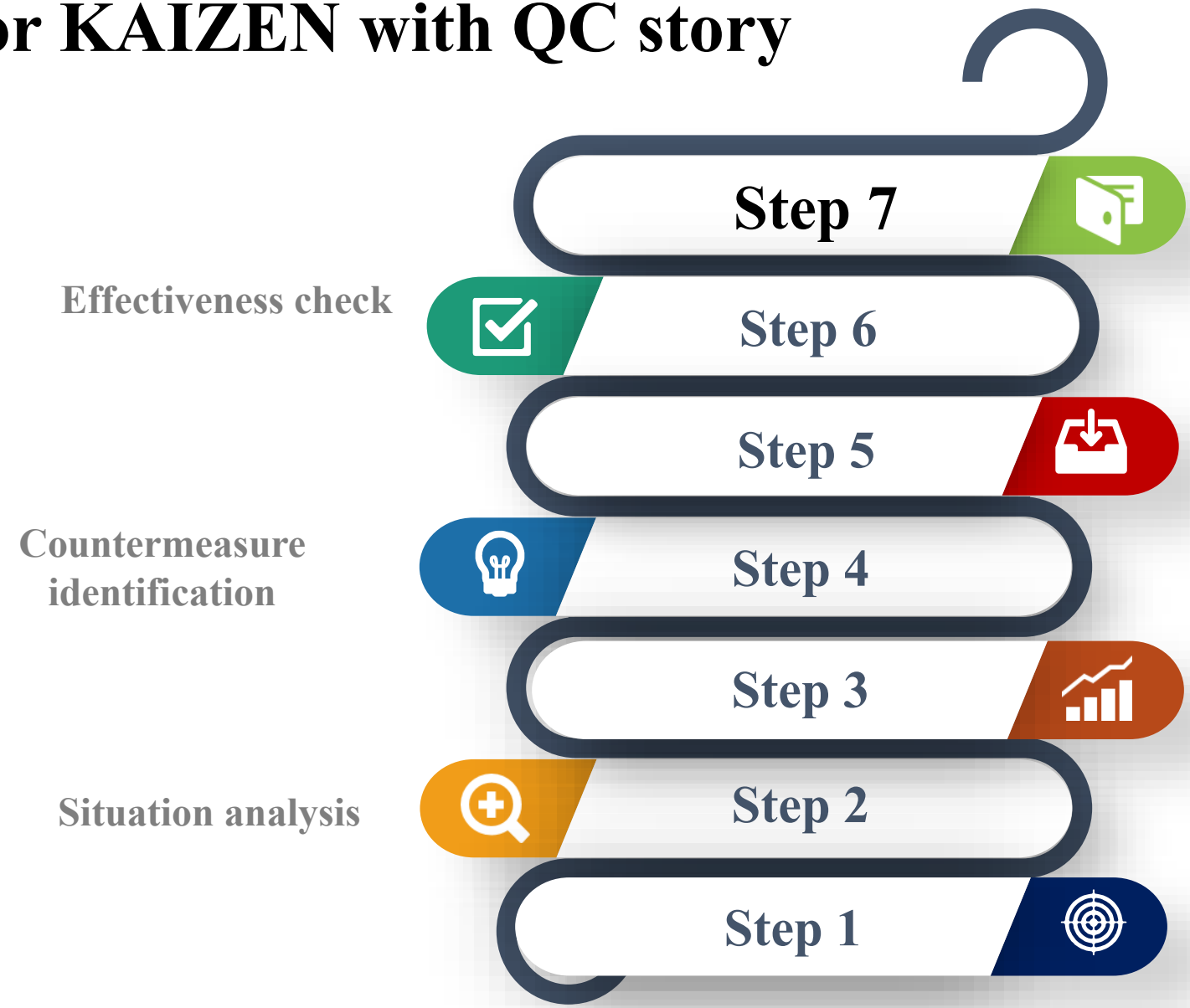
Fujita Planning Co., Ltd.

Objectives

At the end of the lecture, the participants will be able

- To understand the overall concept of QC story Step 7
- To explain about difference between prevention of recurrence and standardization
- To explain about the procedures of QC story Step 7
- To explain about how to develop action plan for “Standardization” with 5W1H and progress monitoring (QC tool)
- To carry out QC story Step 7

Steps for KAIZEN with QC story



Standardization

This step is important to prevent recurrence of the same problem. It is also essential for planning sustainable actions

Effectiveness check

Countermeasure implementation

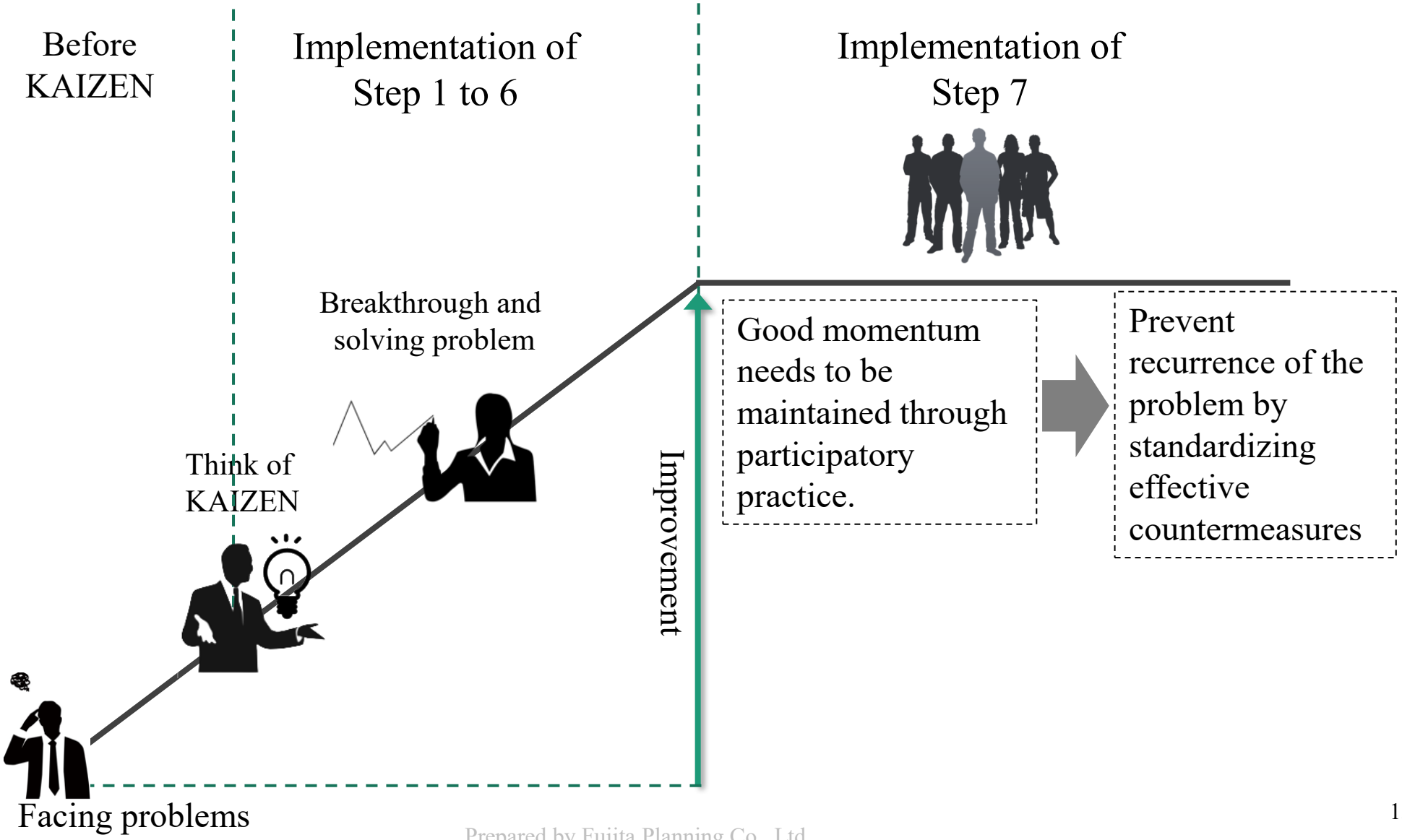
Countermeasure identification

Root cause analysis

Situation analysis

KAIZEN Theme selection

“Don’t forget to add the finishing touches”



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Recurrence prevention & Standardization

Prevention of recurrence

This is to prevent a fallback to the previous situation (before KAIZEN)

Standardization

This is very useful for preventing recurrence of the problem.

Recurrence of the problem can be prevented through the continuous practice of effective countermeasures.

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Process of “Standardization” (1)

1. List the effective countermeasures based on the findings from Step 5 and Step 6.
2. Prepare a planning format using 5W1H for standardization (Step 7).
3. Develop an action plan to sustain the implementation of effective countermeasures.
4. Share the action plan with all staff working in the section and departmen

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“5W1H” for standardization

5W1H	Description
Who?	In-charge of implementation of the standardized activities
What?	Objects and/ or actions for implementation of the standardized activity (What to do)
Where?	Place at where the implementation of standardized activity are practice
When?	Period/ Frequency of implementation of the standardized activities
Why?	Reason for standardization of the effective countermeasure implementation for every staff
How?	Methodology to carry out the implementation of standardized activity (verbs)

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(Example)

Action plan of standardized activities

Effective countermeasures	Who	What	Where	When	Why	How

Note: the action plan in Step 7 is similar with the standardized procedure table in Step 5, however, meaning and purpose of the table are different.

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(Example)

Action plan of standardized activities

Effective countermeasures	Who	What	Where	When	Why	How
Check stock condition of medicines in our section	In-charge of stock management of the day	Medicines in sampling containers	Ward store	Daily	To ensure stock management of sampling container	Use an inventory check list
Check handing over on medication for patients between shifts	All staff working in the shifts	Status of medication for the patients	Ward	Before taking over the shift	To reduce wrong medication for the patients	Check treatment/ medication sheet in the patients record

Note: the action plan in Step 7 is similar with the standardized procedure table in Step 5, however, meaning and purpose of the table are different.

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Process of “Standardization” (2)

5. Implement the activities listed in the action plan as scheduled and monitor the progress of implementation.
6. Continue monitoring the implementation of standardized activities to ensure the prevention of recurrence.

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(Example)

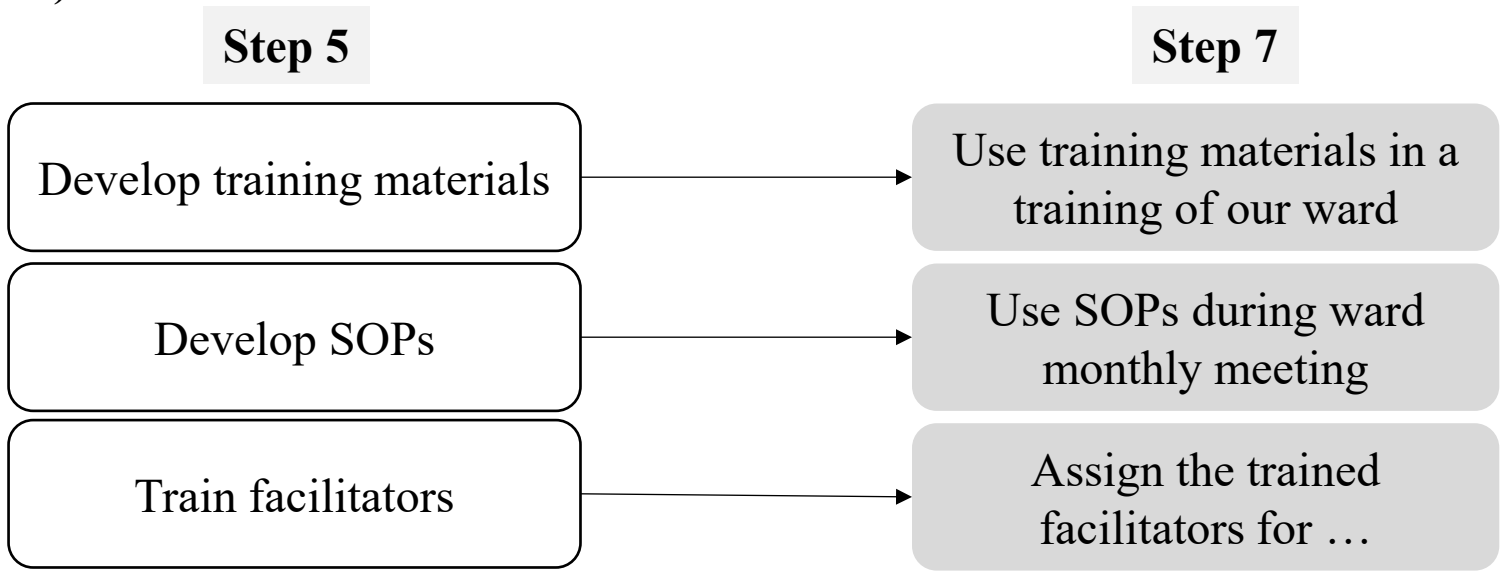
Action plan with progress checklist

Standardized activities	Why	Who	When	Where	What	How	Progress check		Remarks	Checked by …
							Date of progress check	Status		

Tips for successful Step 7

- The expression ‘one-time event’ in Step 5 should be revised to indicate an action that must be continued

(Examples)



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Tips for successful Step 7

Share the action plan and progress checklist with all staff in the workplace.

- Display the standardized procedures in common areas (e.g., notice boards).
- Conduct familiarization sessions for staff.
- Remind staff of the standardized procedures periodically (e.g., during morning meetings).
- Train newly employed staff and students on the standardized procedures.

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Planning of next KAIZEN cases

- Since KAIZEN is a continuous quality improvement activity, it is important to plan the next KAIZEN case after completing the current one (QC story)
- Theme of next KAIZEN cases can be selected from the following sources;
  - Patient satisfaction and experience survey results
  - Monitoring and evaluation results
  - Discussion among staff in the department
  - Theme given by hospital management

Example of annual KAIZEN event in a hospital

Annual KAIZEN Event

National KAIZEN Event

Announce overall theme for <u>annual KAIZEN event</u> by hospital management

KAIZEN team (WIT) at different department will declare the participation on annual KAIZEN event

Implement KAIZEN QC story for 6 months

All KAIZEN teams will present their KAIZEN activities at internal annual KAIZEN event. Best KAIZEN case will be selected

Best KAIZEN team of the hospital will be invited for National annual KAIZEN event to present

March **April** **October** **February**

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Self-checklist of Step7

After completing of step 7, please use the following checklist to ensure that all procedures have been carried out correctly.

Points to check	Self-check
Check whether all effective countermeasures are reflected on standardization plan	Yes / No
Check whether standardization is developed based on “5W1H”	Yes / No
Check whether a monitoring checklist for standardized activities is developed and used	Yes / No
Check whether standardization plan is shared with all staff working in the section/unit	Yes / No

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Self-checklist of the entire steps

After completing of all steps, please use the following checklist to ensure that all procedures have been carried out correctly.

Points to check	Self-check
After completion of one KAIZEN case, check whether discussion and action are taken for next KAIZEN case	Yes / No
Check whether all records of KAIZEN process are kept properly	Yes / No
Check whether starting and completing period of each KAIZEN step is clearly recorded	Yes / No
Check whether All KAIZEN process is planned to complete within 6 months or not; check existence of implementation schedule	Yes / No
Check level of knowledge and skills for using QC tools among staff	Yes / No
Check whether staff are understanding purpose of each KAIZEN step	Yes / No
Check frequency of communication between QIT and KAIZEN members on the KAIZEN case	Yes / No
Check the evidences of countermeasures of the KAIZEN case, for example Training manuals, SOPs, Training report, etc.	Yes / No

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Any question, comments, clarification you need?