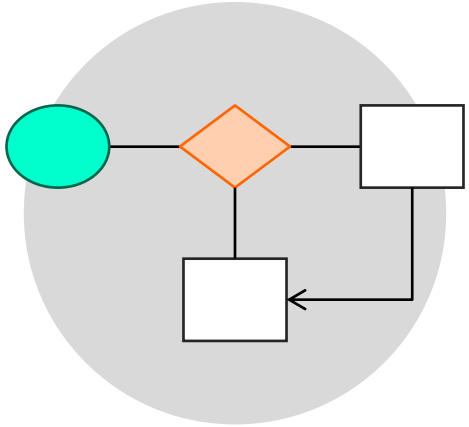
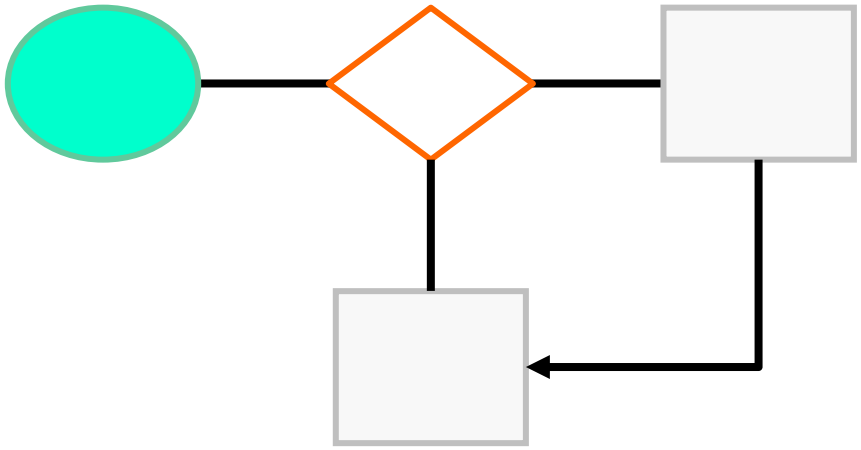
Continuous Improvement Toolkit

FLOWCHARTING



FLOWCHARTING

A graphical tool that illustrates the **flow of a business process** and the relationships between its activities.



Flowcharts are ideal tools to **visually represent** business processes.

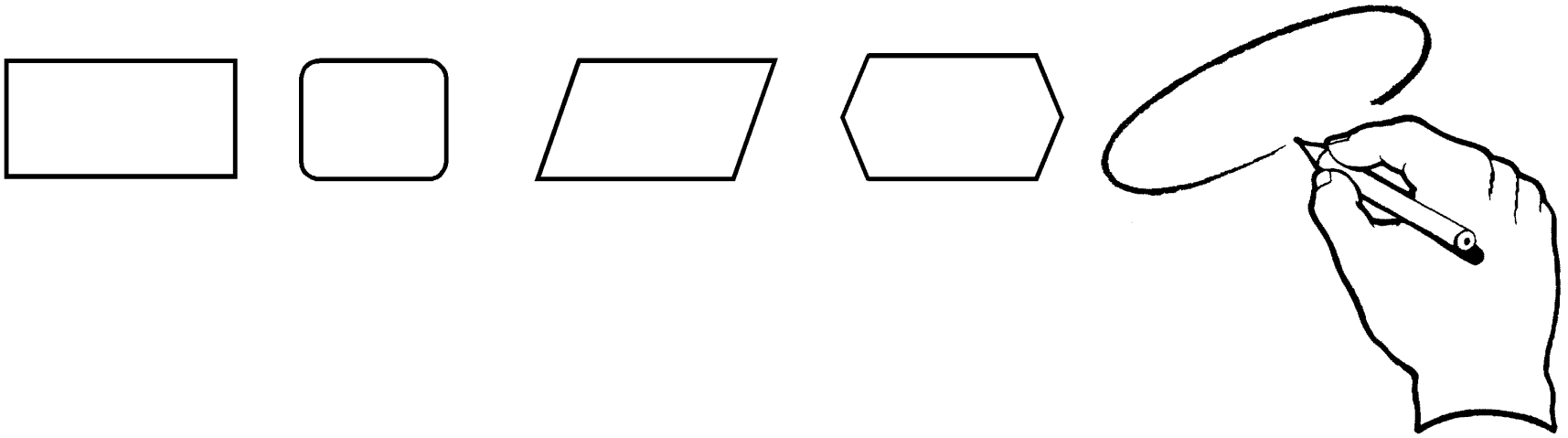
FLOWCHARTING

It allows to break up any process into individual activities and see how they fit together.

This **detailed view** will allow to see how a process looks like.

FLOWCHARTING

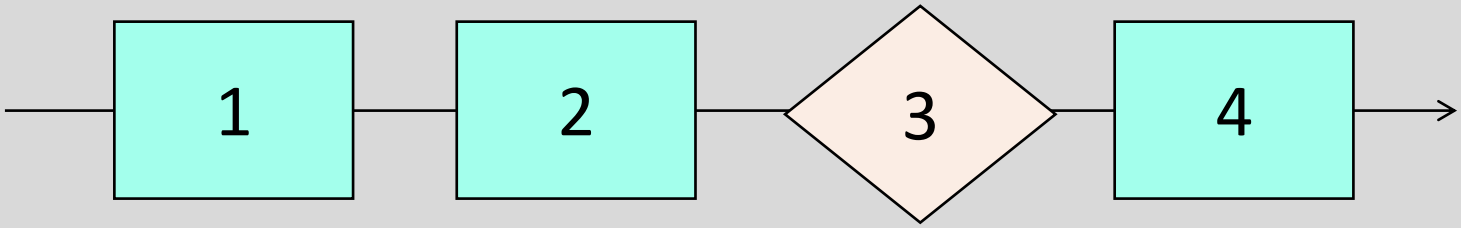
For example, if you want to see the flow of a purchase order or a sales order through the various departments within your company, **flowcharts are good options**.



FLOWCHARTING

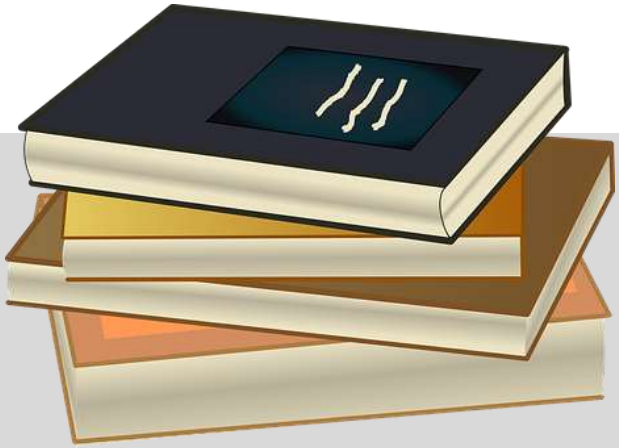
Useful for **understanding and communicating** the sequence of activities and how a process works.

Helps to understand the activities and decisions, and thus, perform the tasks correctly and in the right order.



FLOWCHARTING

Often used for **documenting** how to do a particular job and can be found in procedures and quality manuals.



Flowcharts can be used **by any industry** and in any function

FLOWCHARTING

Used when **designing** new processes to support organizational transformation.

Used to provide a detailed view of how a process **should be**.

FLOWCHARTING

Software developers are using them to map processes that need to be **automated**.

FLOWCHARTING

Kaizen teams are using them to identify and analyze problem areas and provide insight in order to . . .

- Simplify the work
- Reduce cycle times
- Troubleshoot problems
- Improve or redesign processes

DISCOVERY → CONTROL → IMPROVEMENT

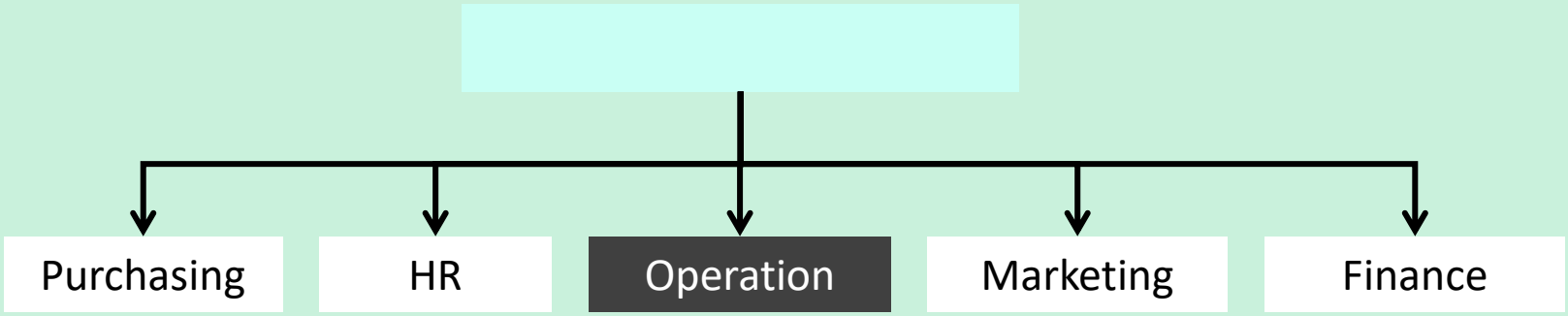
FLOWCHARTING

Useful to reveal the areas of **inefficiency** and diagnosing problems for later problem-solving efforts.

- Redundant activities
- Unnecessary activities (NVA)
- Excessive delays
- Rework

FLOWCHARTING

Allows to look at the organization **horizontally** instead of vertically by looking at how departments and functions are interacting and working together.



Flowcharts can show how an organization produces its outputs through **cross-functional processes**

FLOWCHARTING

BENEFITS

01

Provides a common understanding when discussing and analyzing processes

02

Provides clarity to a process that appears disordered or complicated

03

Provides understanding of the relationships within a process

04

Helps communicating any changes or improvements made on the process

05

Helps explaining the process to new employees and subcontractors

06

Helps suppliers understanding the process before parts or items are supplied

07

Helps addressing risk factors within a process

08

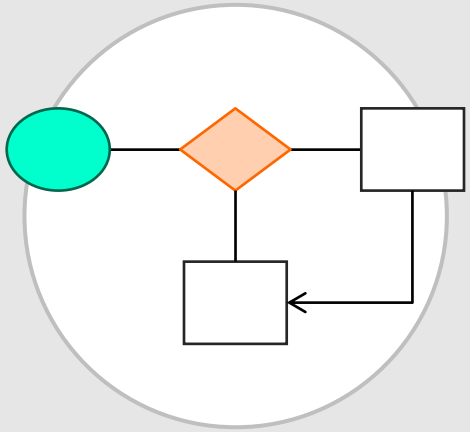
Helps investigating the performance of a processes (e.g., cycle time)

09

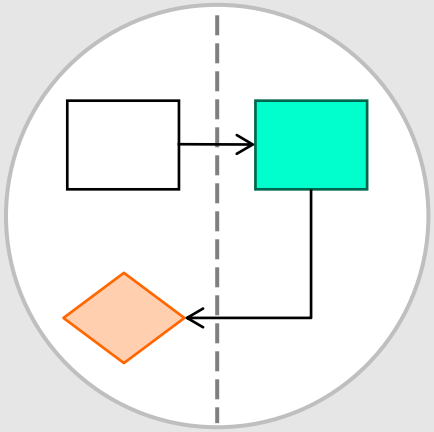
Used when designing new processes

FLOWCHARTING

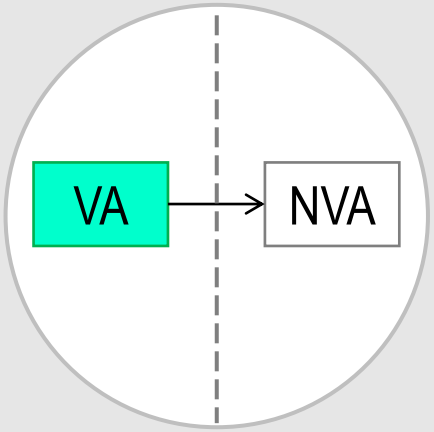
Flowchart Types



ACTIVITY



SWIMLANE



OPPORTUNITY

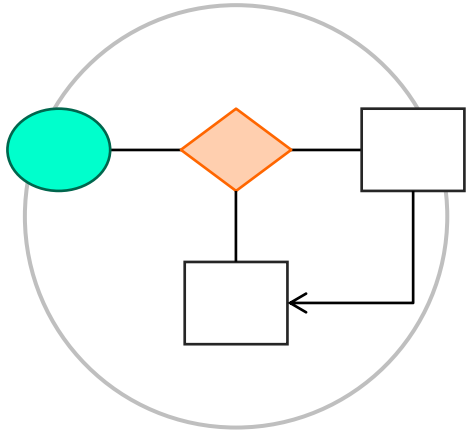
INDUSTRY-SPECIFIC

FLOWCHARTING

Activity Flowchart

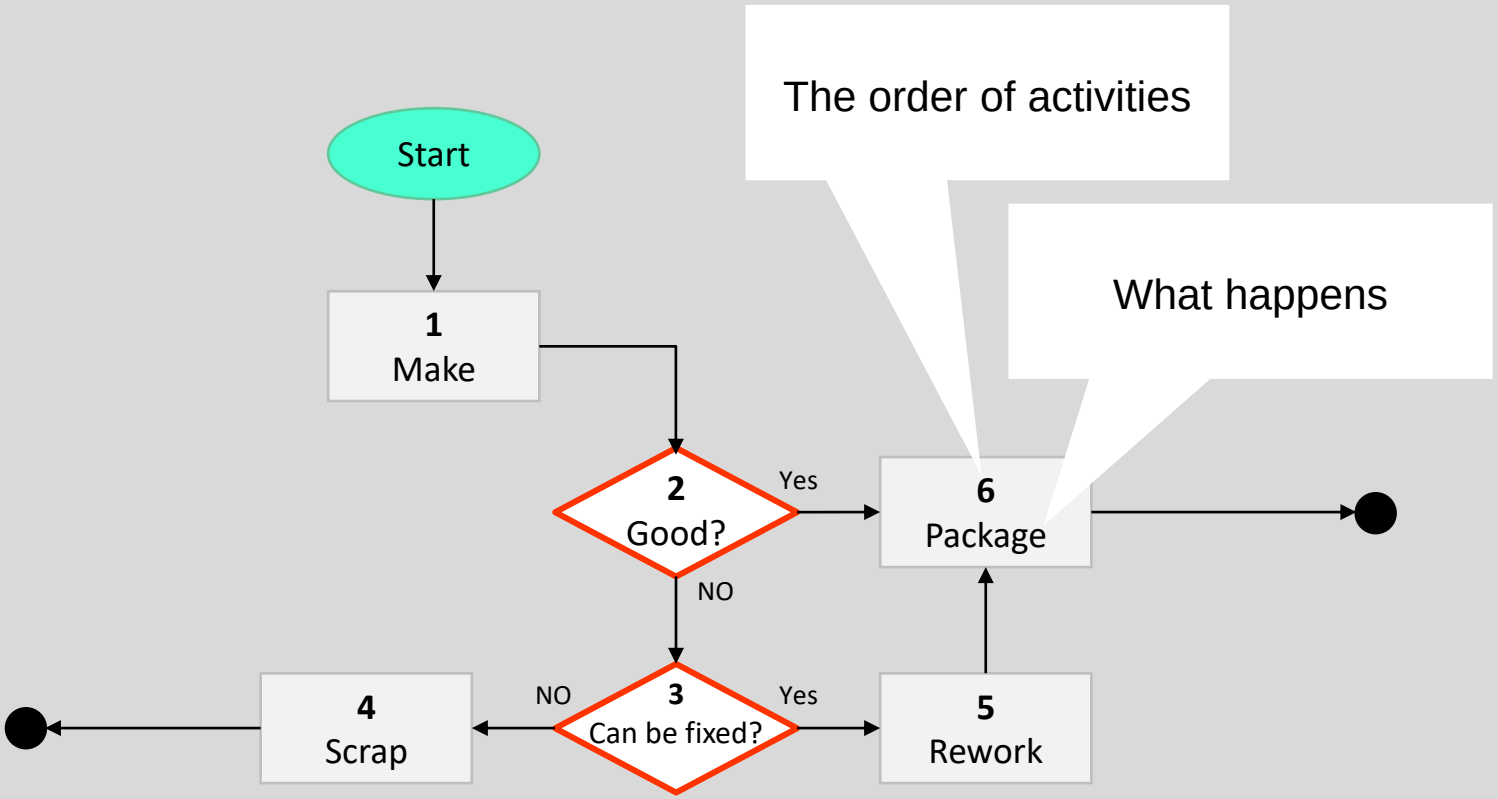
Displays the sequence of the activities that make up the process in a way that focuses on what happens.

Activity flowcharts are the **basic forms** of flowcharts.



FLOWCHARTING

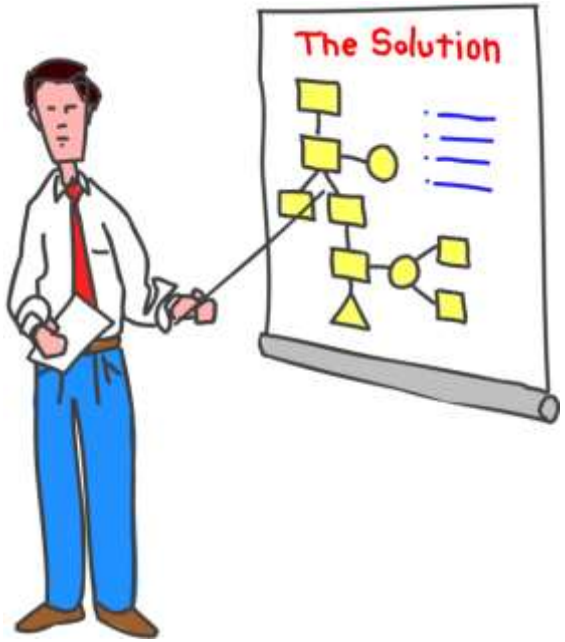
Activity Flowchart



FLOWCHARTING

Activity flowcharts illustrates . . .

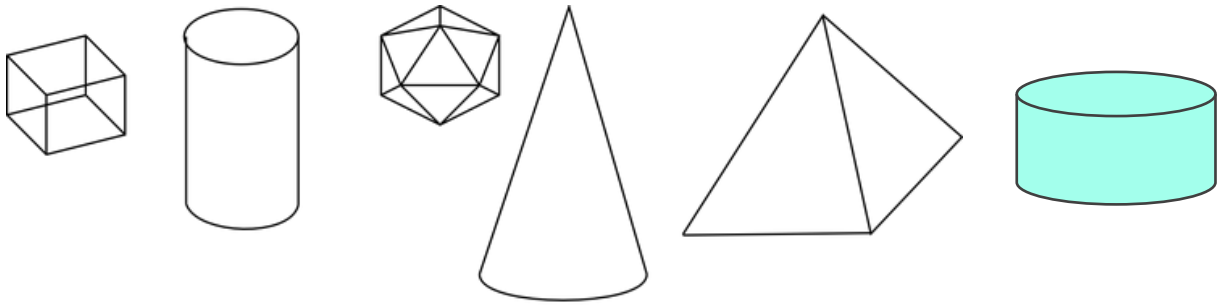
- The flow of activities
- The order of steps
- Decision points
- Rework loops
- Process boundaries



FLOWCHARTING

Activity Flowchart

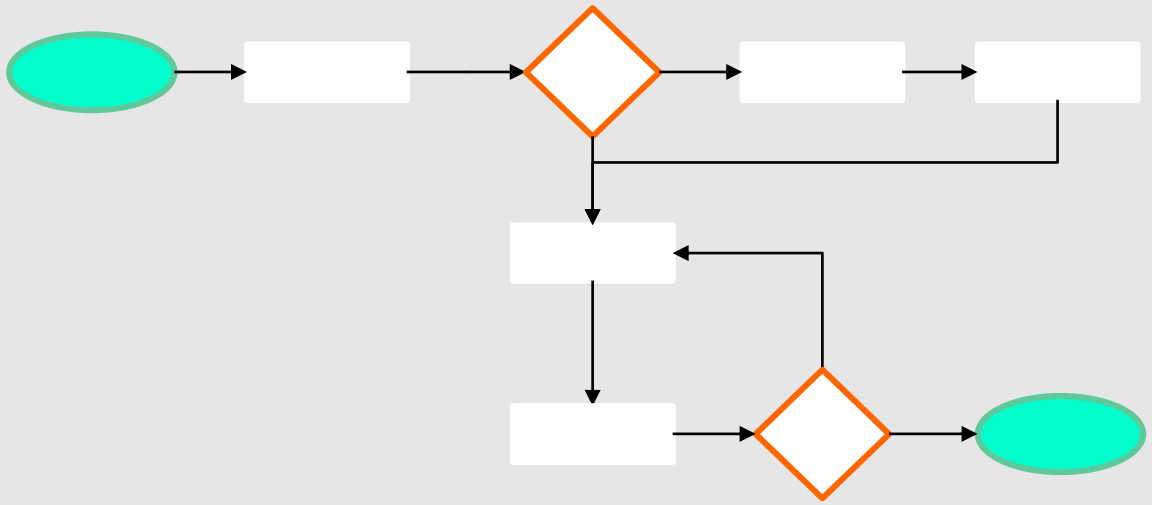
- There is no precise format for a flowchart.
- It should be drawn in a consistent and uniform manner.
- There should be an agreement of the used shapes.



FLOWCHARTING

Activity Flowchart

Typically drawn with **arrows** and **shapes** of various kinds to represent different types of activities.



FLOWCHARTING

Basic Flowchart Shapes

Represents an **activity** or action	Activity
Represents a **decision** point	Decision
The **start** and the **end** of the process	Start / end
Connects the shapes and shows process flow	Flow line

FLOWCHARTING

Basic Flowchart Shapes

ACTIVITY

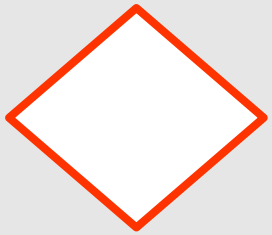
FLOW LINE

- Denoted as a rectangular box.
- The task or action to be performed.
- The most frequently used shape.

- Connects the shapes and indicates the flow of the process.
- Can be labeled.
- Used to indicate a loop.

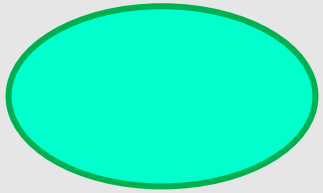
FLOWCHARTING

Basic Flowchart Shapes



DECISION POINT

- Requires a YES/NO response.
- Other responses are also valid such as: (TRUE/FALSE) & (<=0/>0)
- Labeled in the form of a question.
- Has two outgoing paths in most cases.



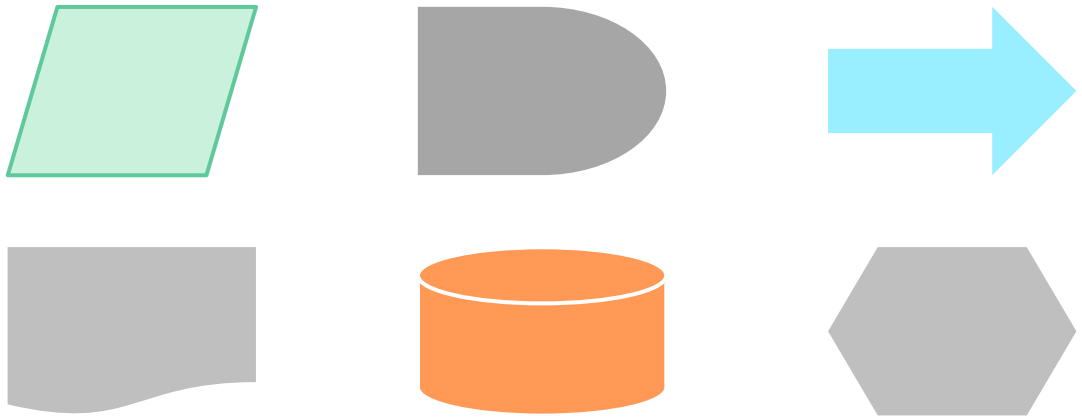
START / END

- Defines the process boundaries.
- There should be one start and one end.
- Also used to indicate that a branch from a decision comes to an end (use STOP).

FLOWCHARTING

Other Shapes

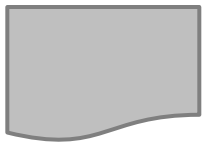
Can be used to describe the types of activities more specifically**.**



Keep things **simple** to gain people's understanding

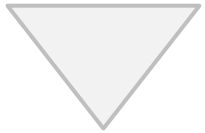
FLOWCHARTING

Other Shapes

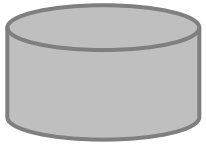


Document

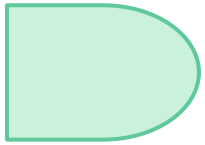
Input/output



File

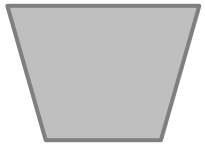


Database



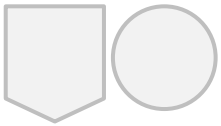
Delay

Terminal point



Manual activity

Card

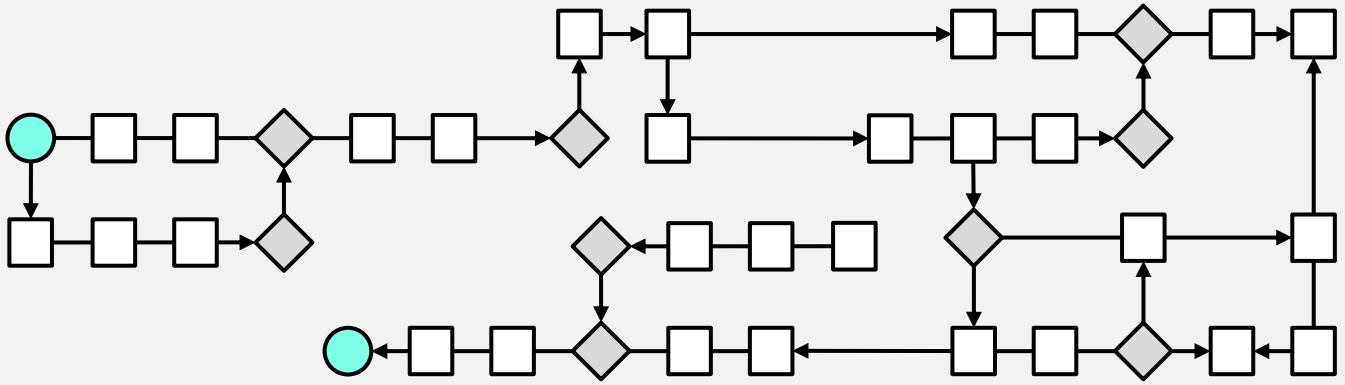


Connectors

FLOWCHARTING

Connectors

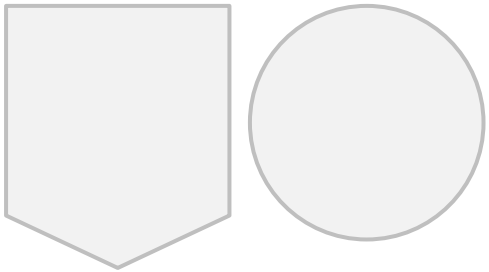
- A single flowchart can quickly become long and complicated.
- You may need to represent everything in more than one page.

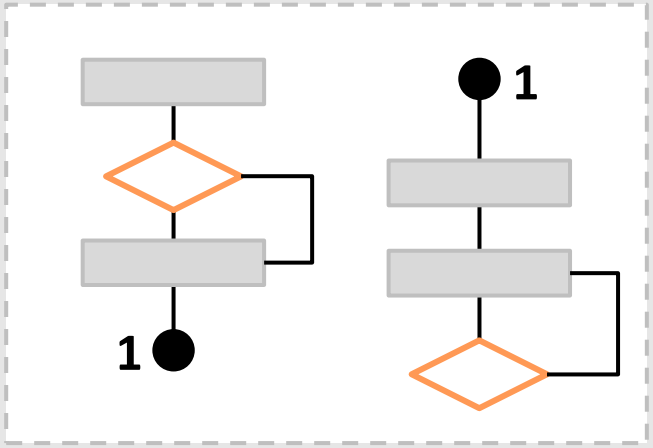


FLOWCHARTING

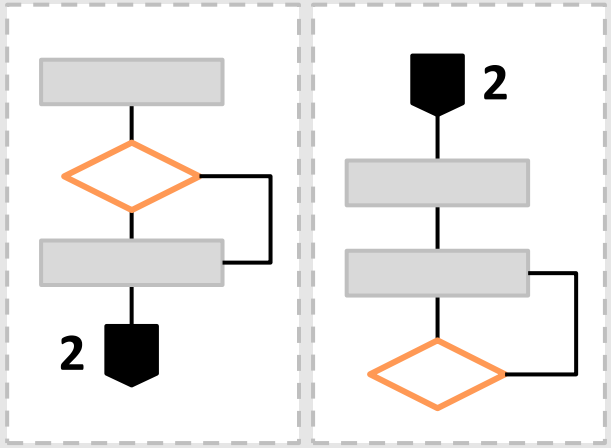
Connectors

Flowcharts may contain connectors to link sub-processes or to represent converging paths (in nested flowcharts).





Same page



Multiple pages

FLOWCHARTING

More information can be displayed in flowcharts including . . .

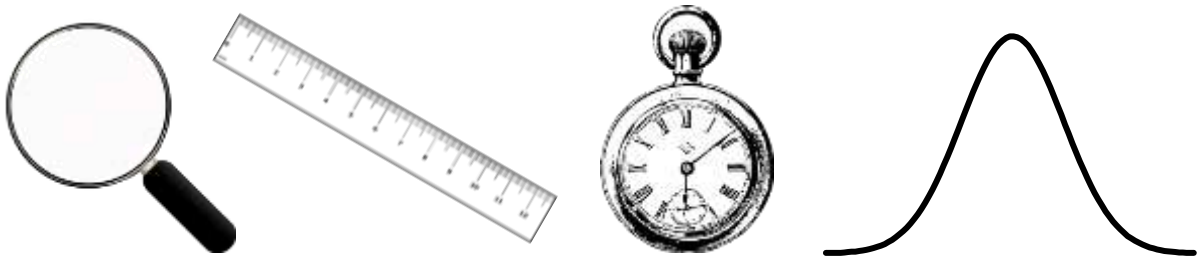
The **time** it takes to perform each activity

The **responsible** person for each activity

The responsible person for each **decision**

FLOWCHARTING

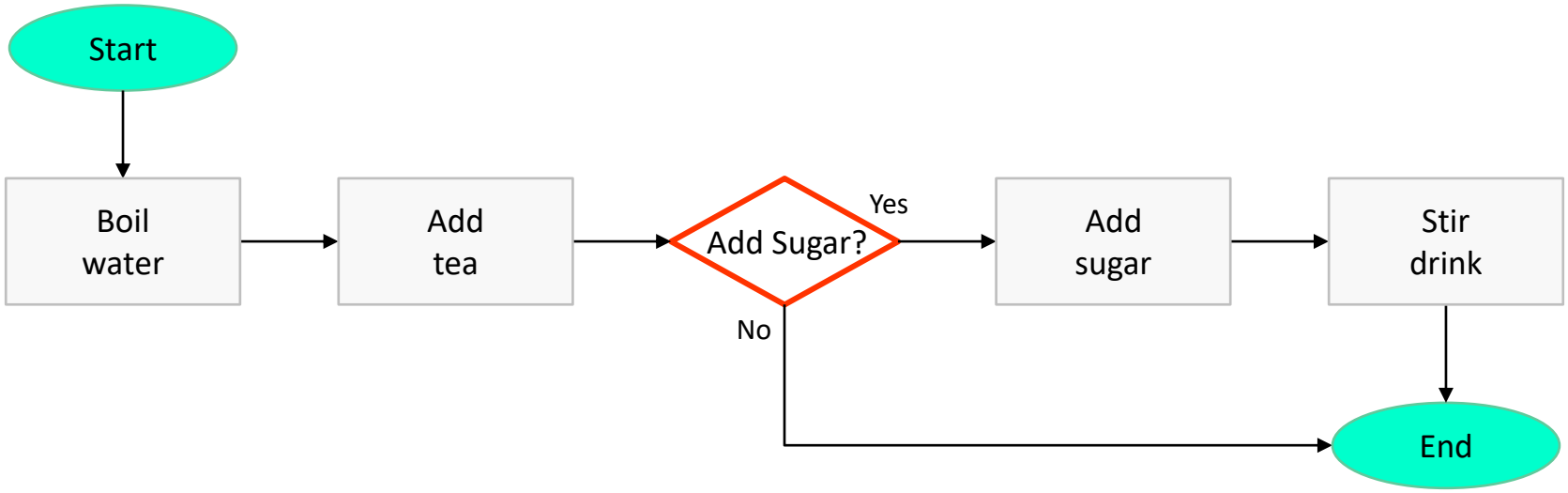
More information can be displayed in flowcharts including . . .

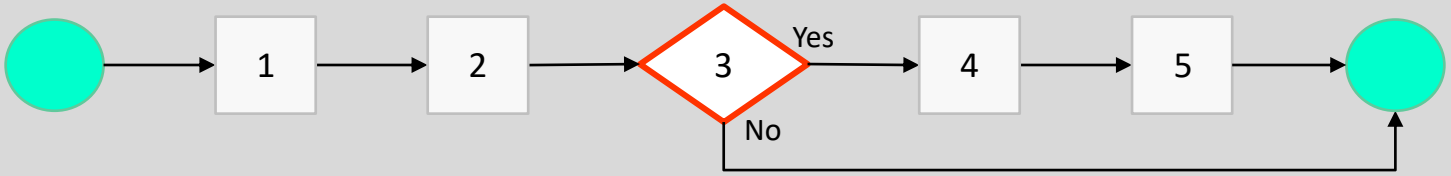


Measurement points and **KPIs**	**Data collection** points
Process control and **inspection** points	Scrap and **rework** points
Error proofing points	**Data storing** and retrieving points

FLOWCHARTING

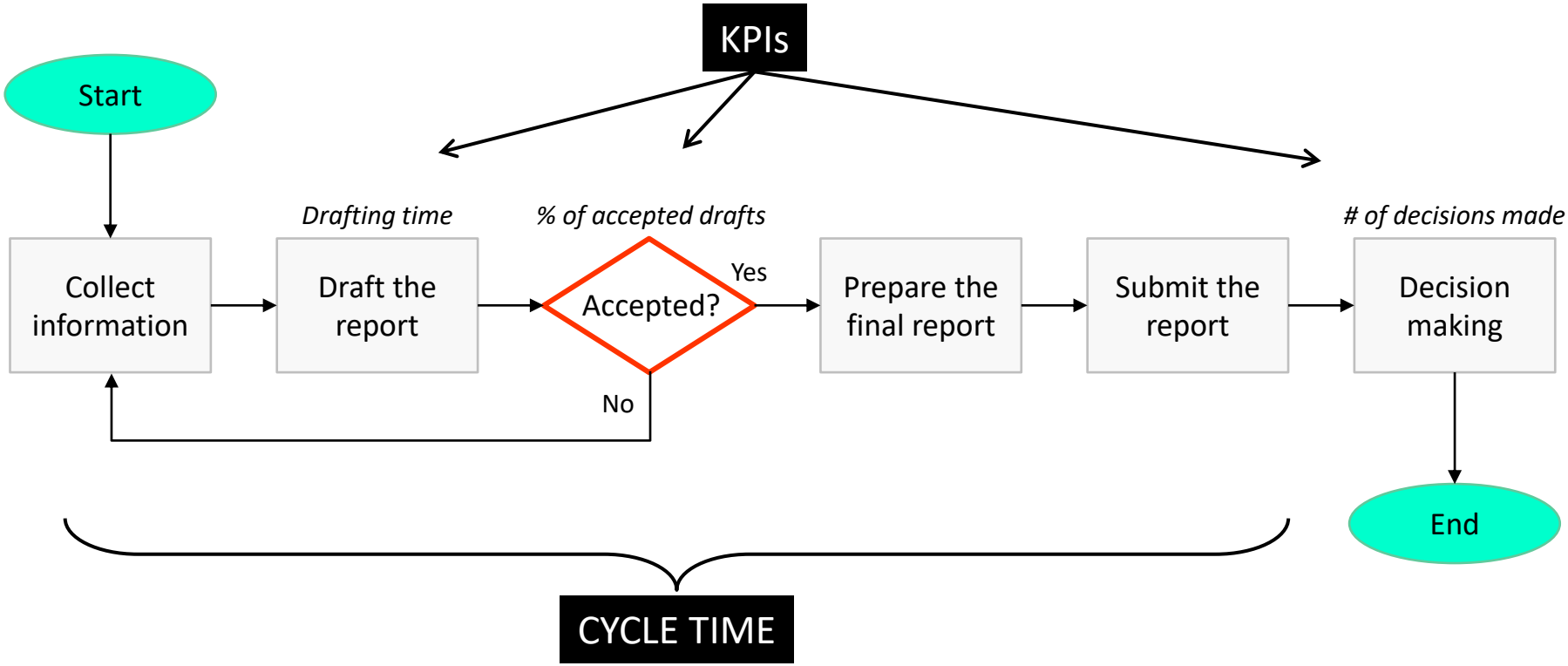
Example – Making a Cup of Tea





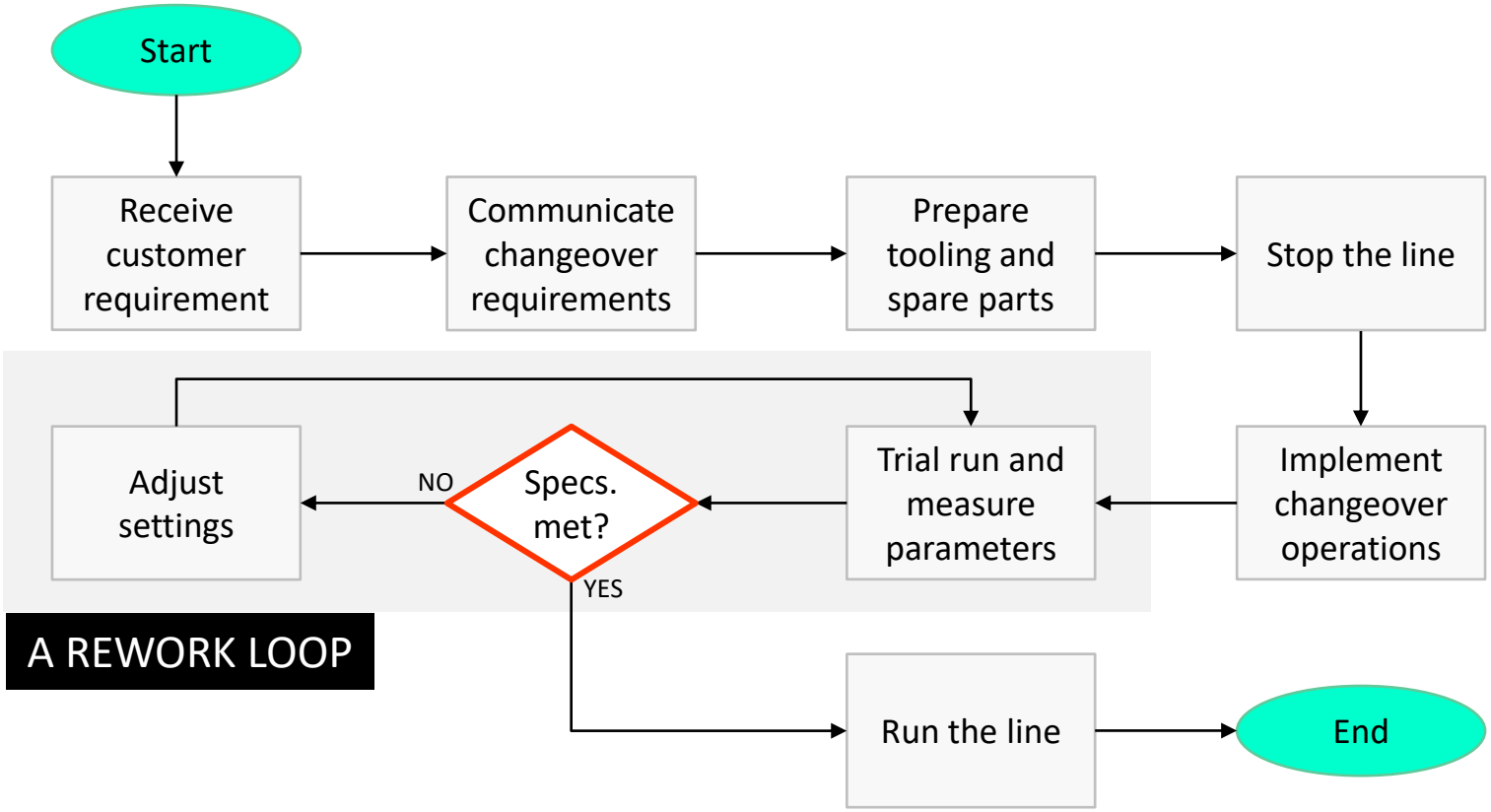
FLOWCHARTING

Example – Preparing Reports for Decision Makers



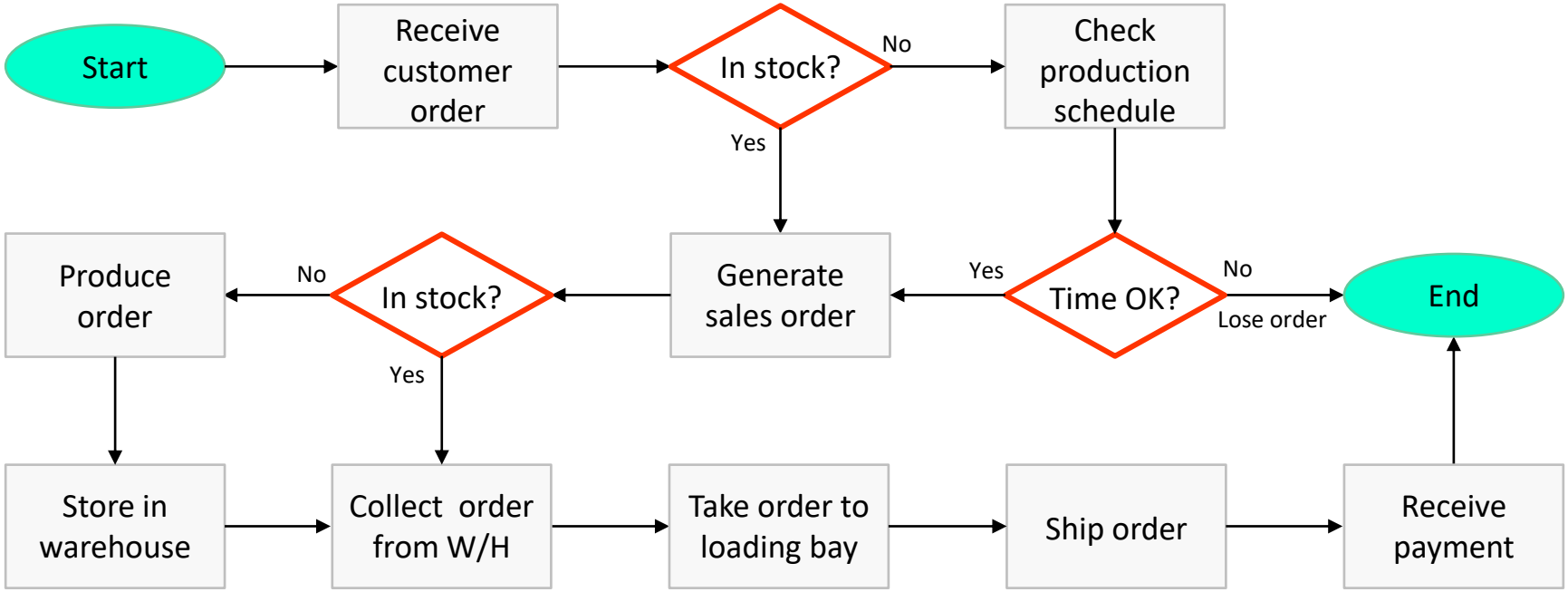
FLOWCHARTING

Example – Changeover (Size Conversion)



FLOWCHARTING

Example – Customer Order Processing

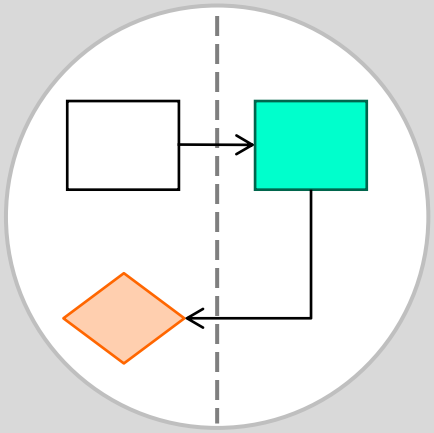


This flowchart shows the flow of **material** as well as the flow of **information**

FLOWCHARTING

Swimlane Flowchart

A flowchart that illustrates the sequence of activities required to accomplish a **cross-functional** process.

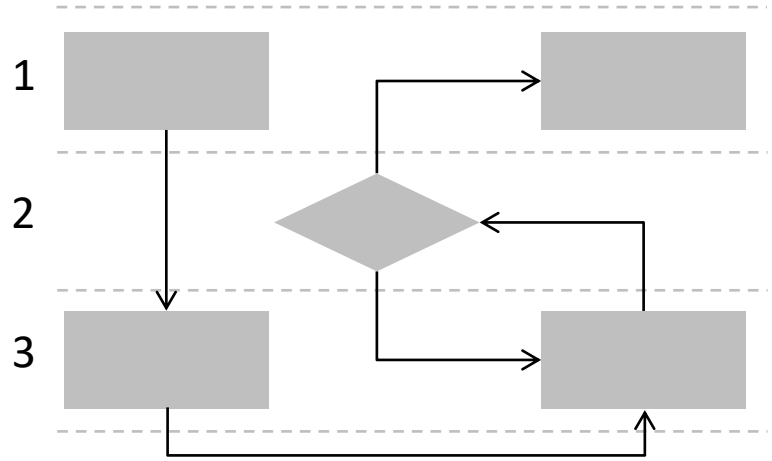


Also called **deployment** or **cross-functional** flowchart

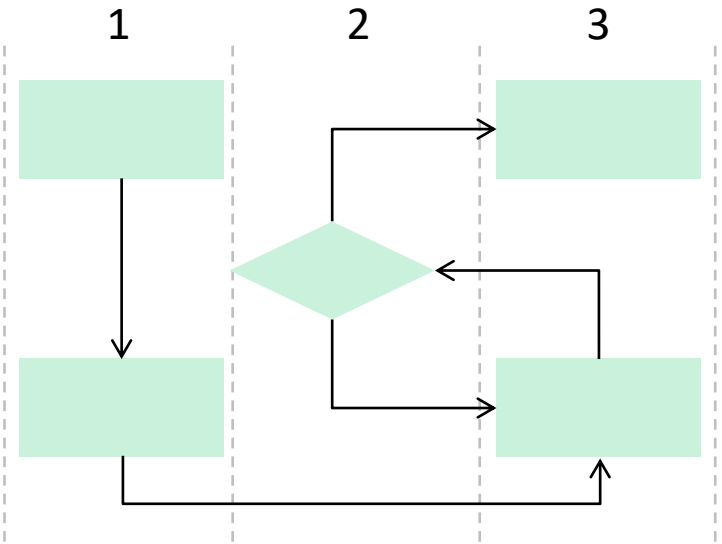
FLOWCHARTING

Swimlane Flowchart

This type of flowchart is divided into **multiple lanes**.



Horizontal lanes

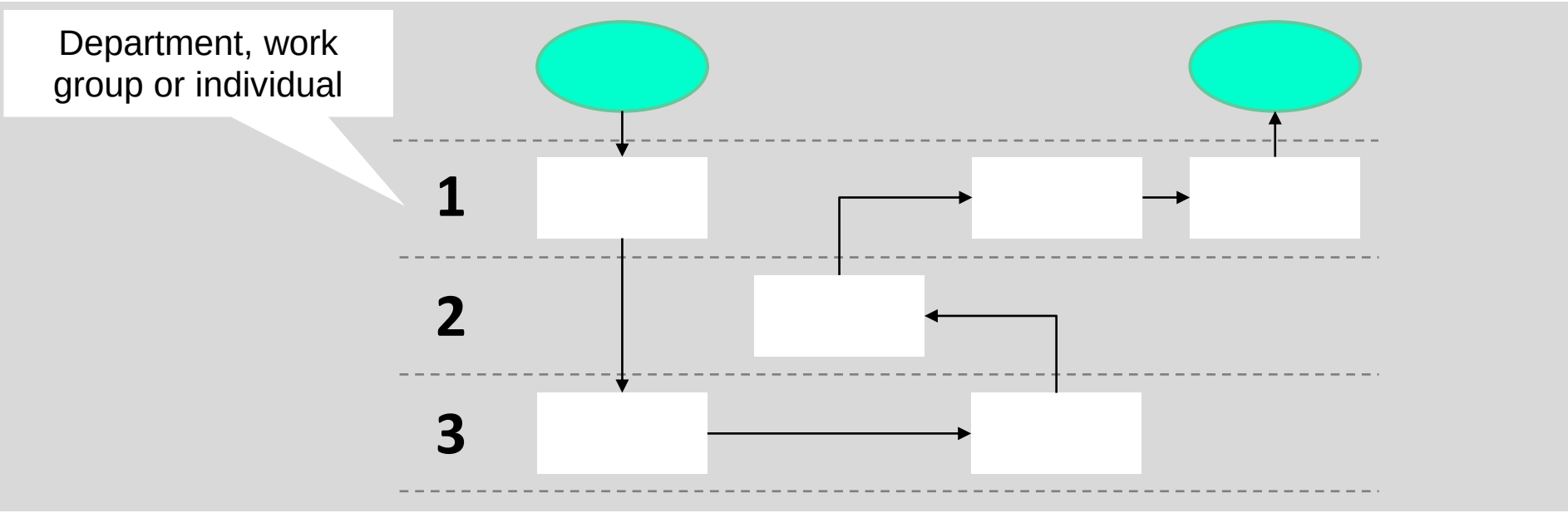


Vertical lanes

FLOWCHARTING

Swimlane Flowchart

Used when the process involves **several departments**.



Divides the chart into different **lines of responsibilities**

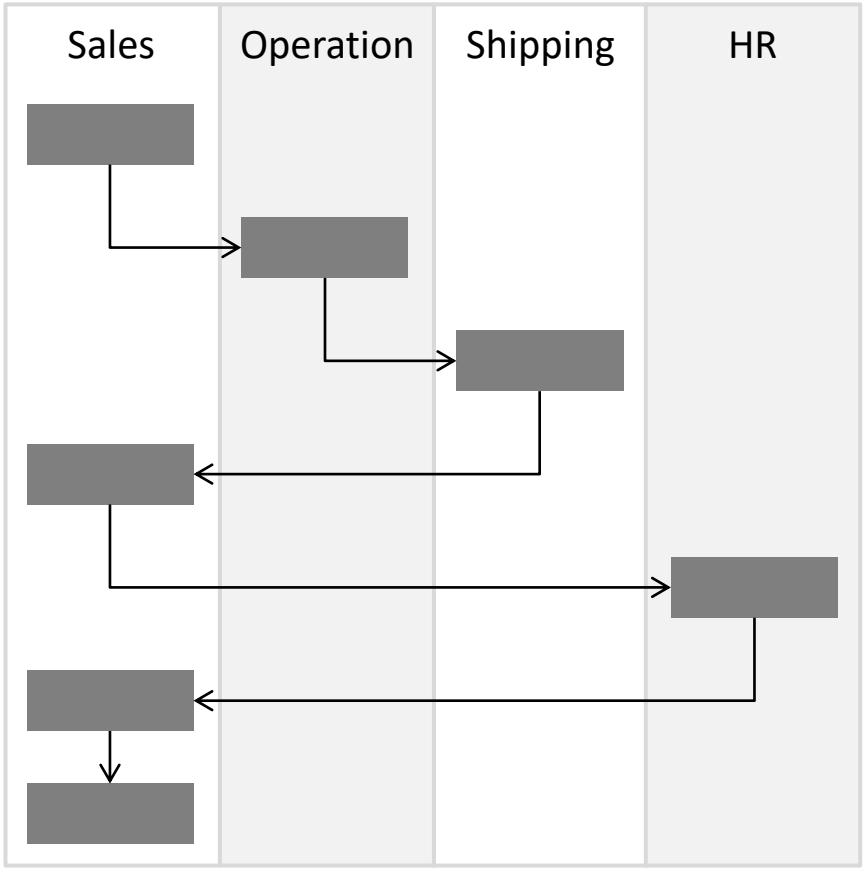
FLOWCHARTING

Swimlane flowcharts shows . . .

WHAT?

- The flow of activities
- The order of steps
- Decision points and rework loops
- Process boundaries
- **Who** is handling or doing the work ➡ People or functions

FLOWCHARTING



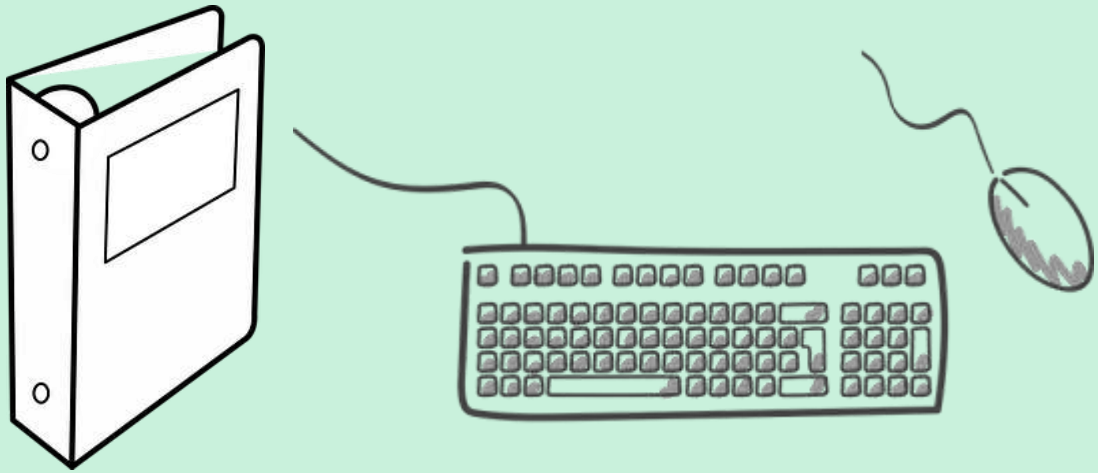
This type of flowchart is ideal for showing the **control** of the different departments and work groups on each process activity

It clarifies the **responsibility** for performing an activity or making a decision

You may have **only one** department, work group or person responsible for any activity, yet have many performers

FLOWCHARTING

Particularly helpful for **non-manufacturing processes** which mainly involve the flow of information, knowledge, and documents between people and departments.



FLOWCHARTING

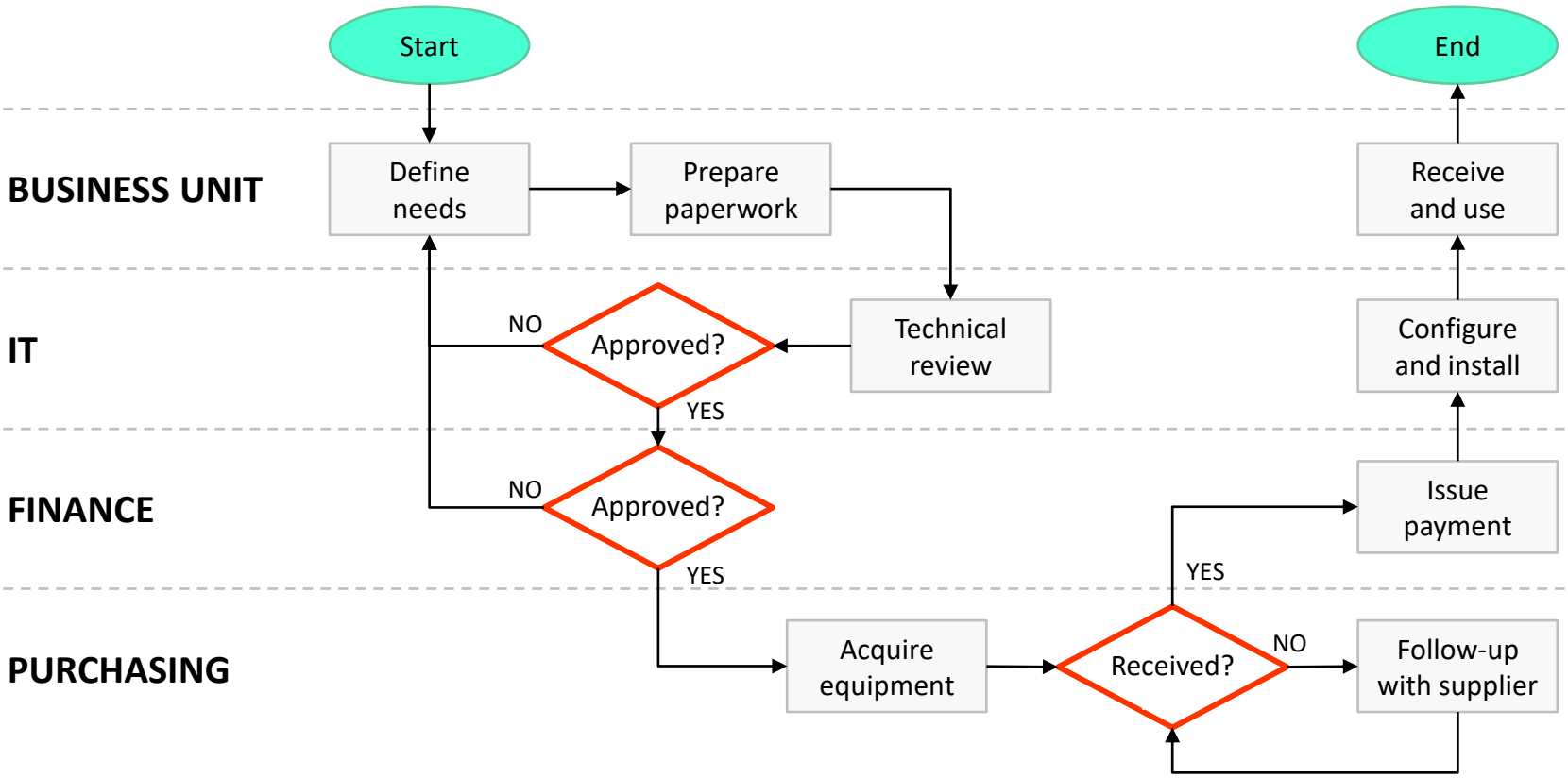
Useful in processes with many **handoffs**, where information and documents are passed back and forth among departments.

Helps highlighting the **handoff areas** that are causing disagreements.

When there are a lot of handoffs within a process, this maybe a sign for having **waste** due to unnecessary transporting, wasted motion or overprocessing

FLOWCHARTING

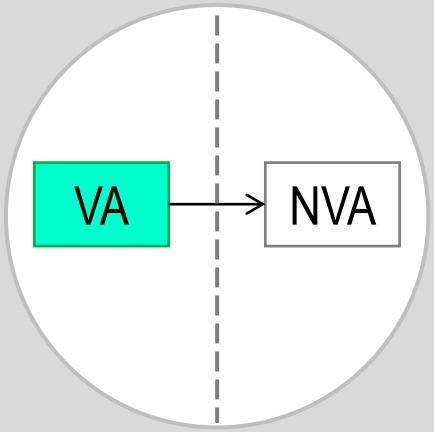
Example – Acquiring New Equipment



FLOWCHARTING

Opportunity Flowchart

A flowchart that provides a way to analyze and study business processes by highlighting the steps that add **waste and complexity** to the process.



FLOWCHARTING

Opportunity Flowchart

Divides the chart into **two sections** to differentiate the activities and decisions in the process that add value from those that don't.

FLOWCHARTING

Opportunity Flowchart

Value-added

- Customers are willing to pay for them.
- They physically changes the product.
- They are done right the first time.
- Include machining a part and serving a customer.

Essential non-value-added

- Add no value and the customer is not willing to pay for them.
- They are necessary for the business due to the current settings of the process.
- Include inspection and prevention activities.

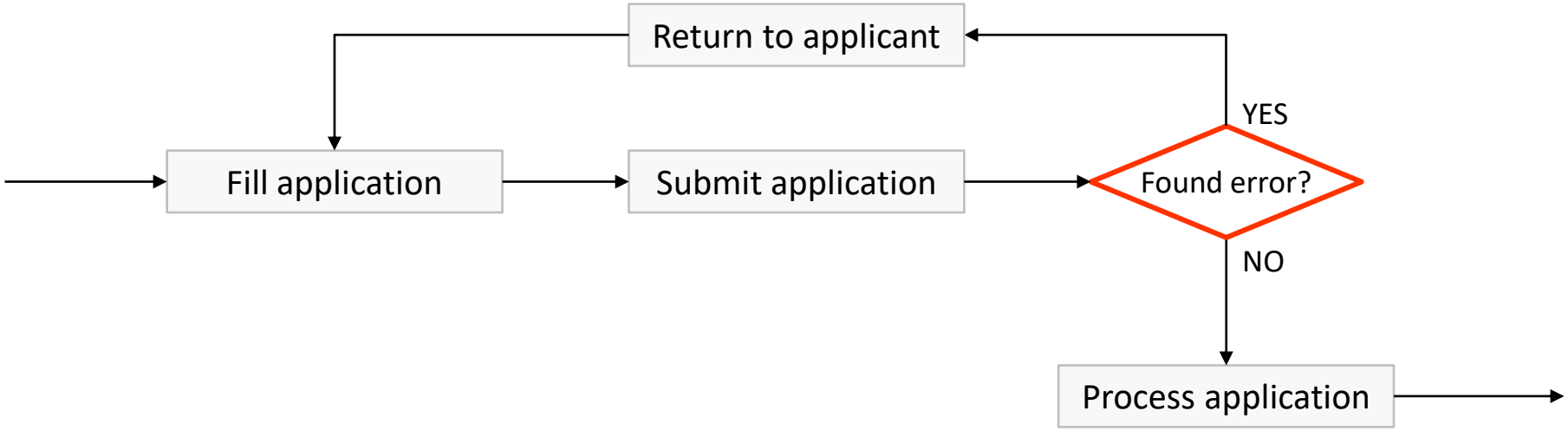
Non-value-added

- Not essential to produce output.
- Do not add value to the output.
- Include defects, errors, waiting, transport, inventory, unnecessary processing, etc.

FLOWCHARTING

Opportunity Flowchart

Reveals **opportunities for improvement** as it will increase the awareness of what previously was accepted as normal and unavoidable waste.



FLOWCHARTING

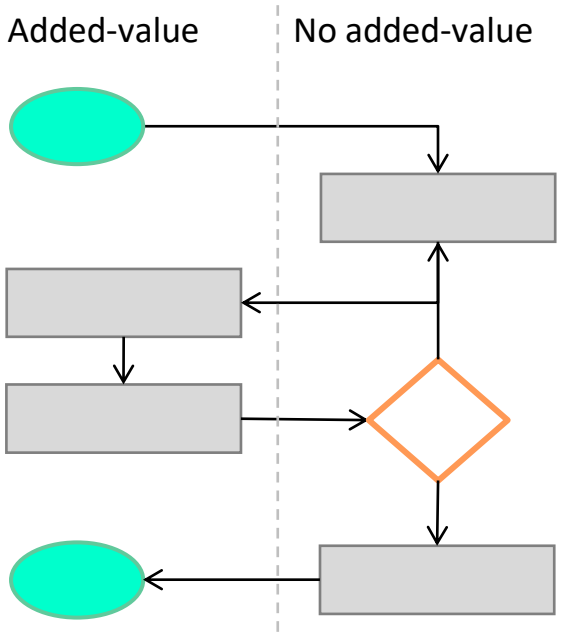
Opportunity Flowchart

Time will normally flow down the page

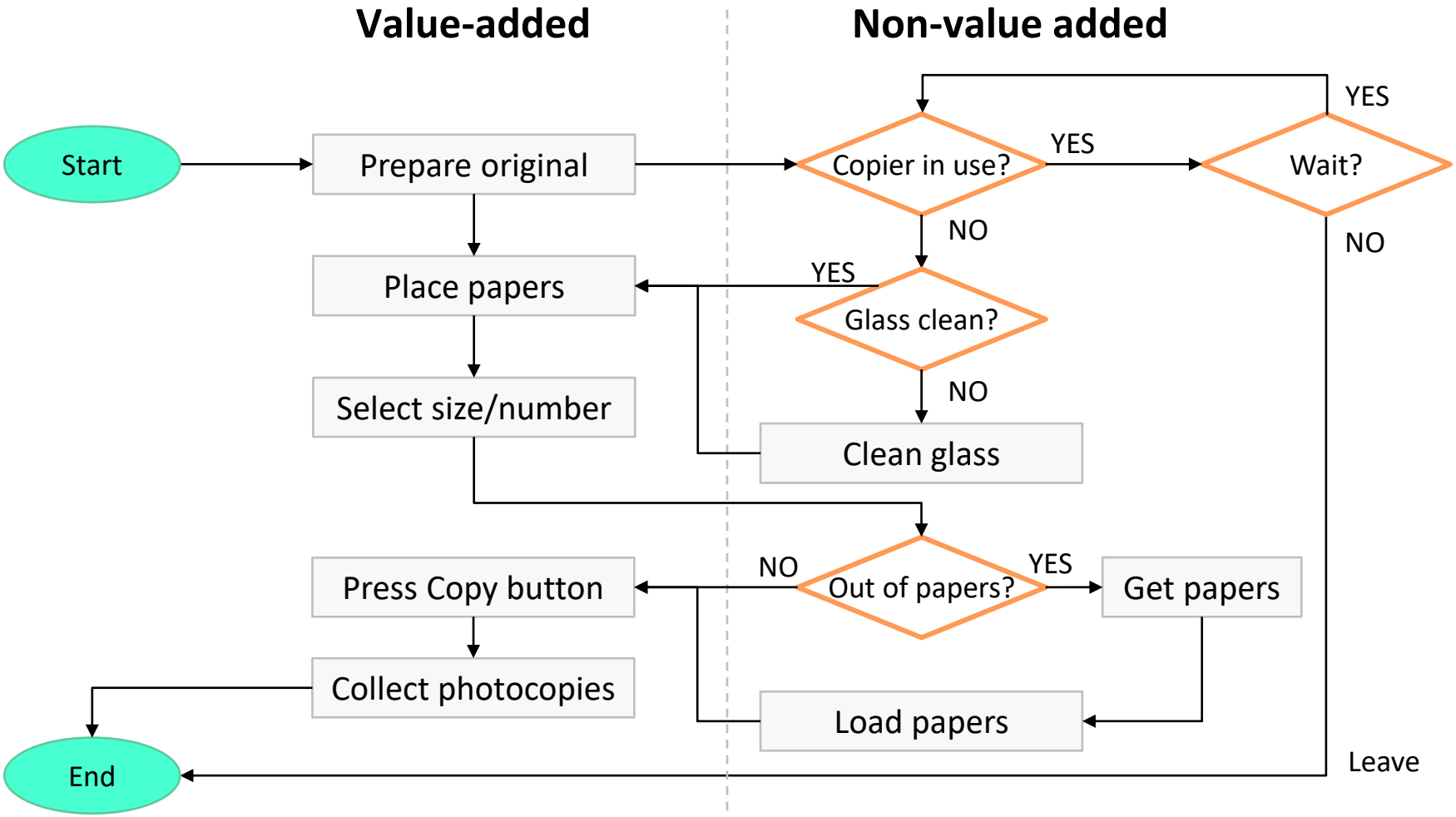
When charting the **present process**, the value-added section is often smaller in size

If there are only value-added activities, the process will be simple and **straightforward**

If the errors could be reduced or prevented, there is a great chance to simplify and streamline the process



FLOWCHARTING



FLOWCHARTING

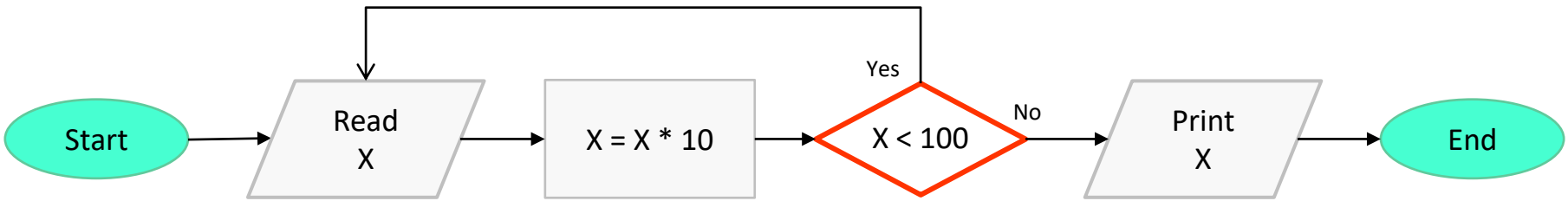
Industry Specific Flowchart

Flowcharts are widely used in software development, quality management and auditing practices.

FLOWCHARTING

Industry Specific Flowchart

It can help in designing and documenting computer programs and used as a mean for describing **computer algorithms**.

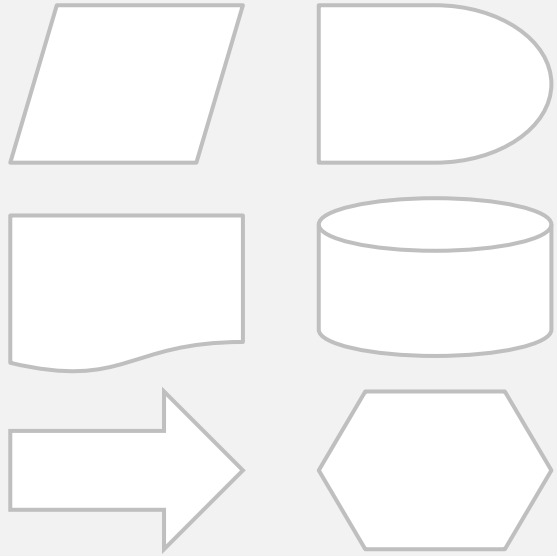


FLOWCHARTING

Industry Specific Flowchart

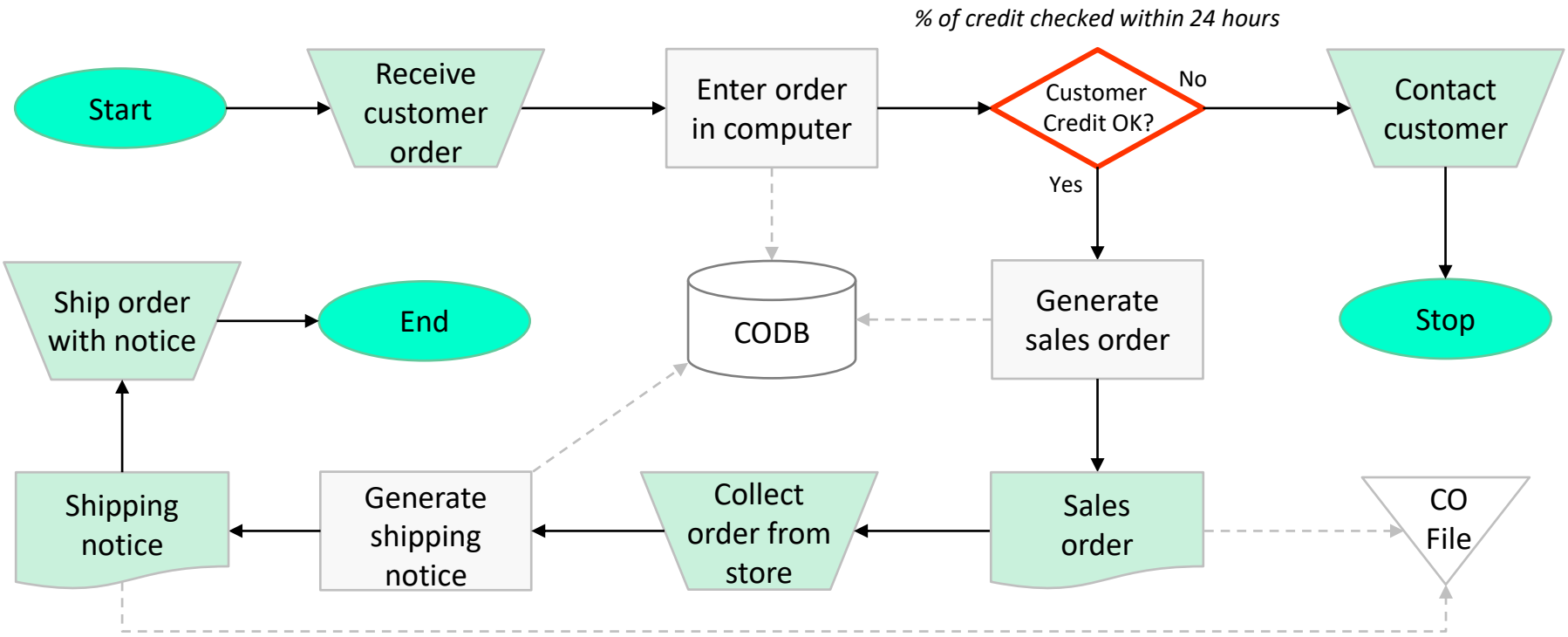
When developing flowcharts for a particular industry, remember to use the shapes and symbols for that industry.

Producing a **glossary** to describe the meaning of each of the shape can be helpful.



FLOWCHARTING

Example – Customer Order Processing



This flowchart shows the flow of **material** as well as the flow of **information**

FLOWCHARTING

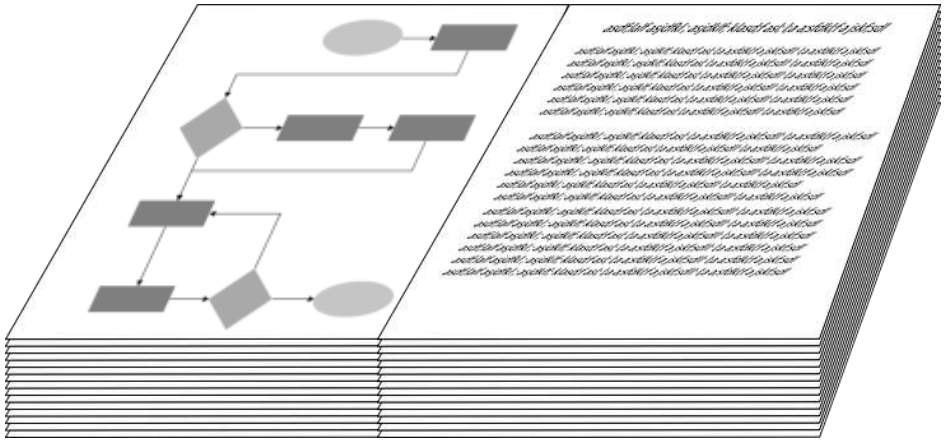
Document Management and Flowcharts

Companies often **document their procedures** and processes to comply with their industry regulations and meet the continuous auditing requirements.

FLOWCHARTING

Document Management and Flowcharts

Every company should have a standardized way for documenting their procedures and processes.

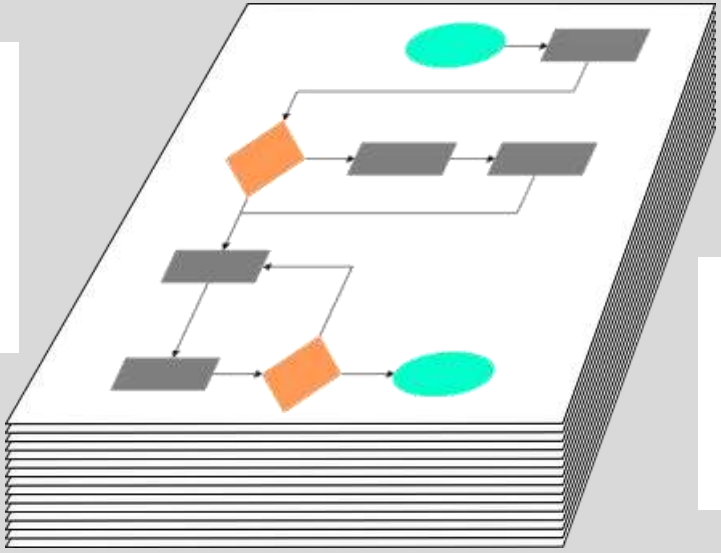


FLOWCHARTING

Document Management and Flowcharts

Flowcharts can be useful to summarize a procedure or a process.

Flowcharts can play an important role of document management as they help understanding procedures and work instructions

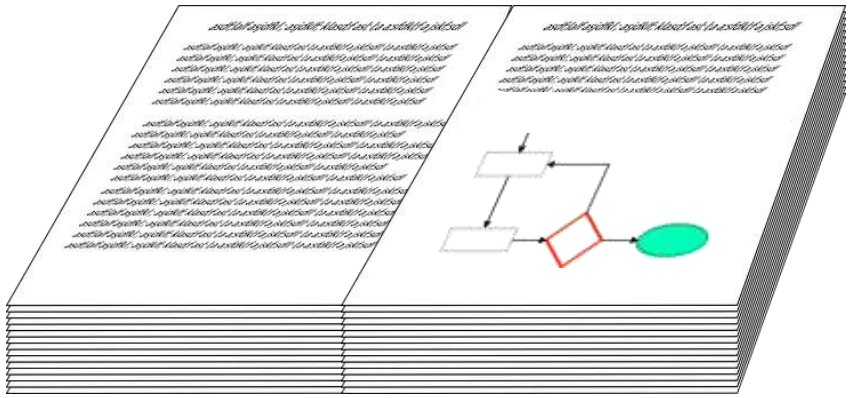


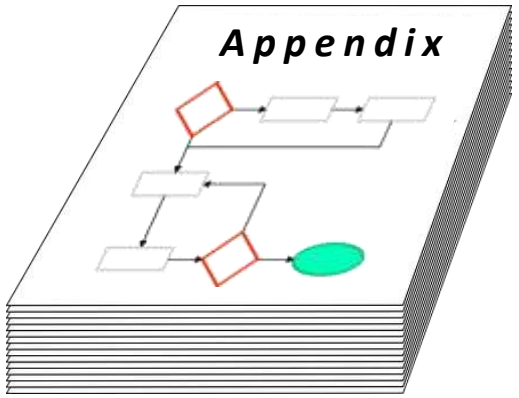
They can highlight waste and inefficiencies and reveal opportunities for continuous improvement

FLOWCHARTING

Document Management and Flowcharts

Flowcharts can either be included under the relevant procedure or be placed in the appendix at the end of the document or manual.





FLOWCHARTING

Document Management and Flowcharts

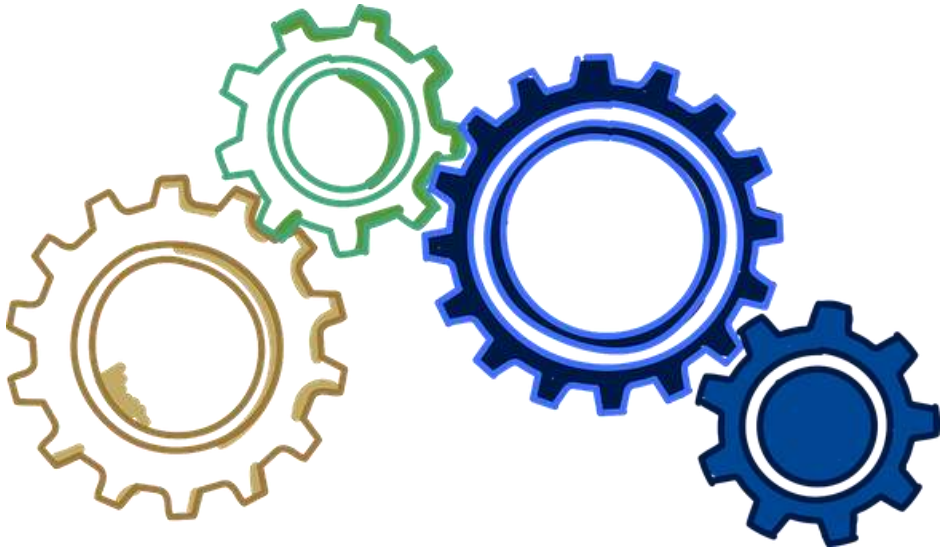
One of the common approaches when documenting a procedure is to **start with** the flowchart, and then describe each process activity in a tabular format.

SN	Activity	Responsible	Output / Record
1	Prepare interview panel	HR Representative	
2	Notify applicant of schedule	HR Representative	
3	Appointment agreed? • If yes, go to step 5 • If no, stop	Interviewee	
4	Prepare interview questions	HR Representative	Interview Questions

FLOWCHARTING

Document Management and Flowcharts

If several people are going to chart the processes, design a template to ensure that one language is being spoken.



FLOWCHARTING

How to Construct a Flowchart

With your team, **describe the process** and your objectives

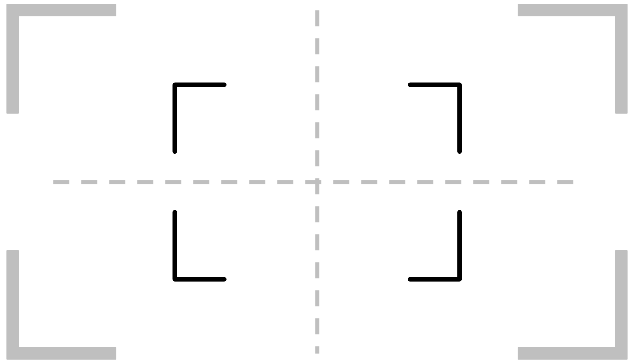
Working in a team will help get multiple viewpoints!

FLOWCHARTING

How to Construct a Flowchart

Determine the type of flowchart, the **level of detail**, and the appropriate scope and boundaries

If the decision is to create a swimlane flowchart, work with your team to agree on what departments should be included

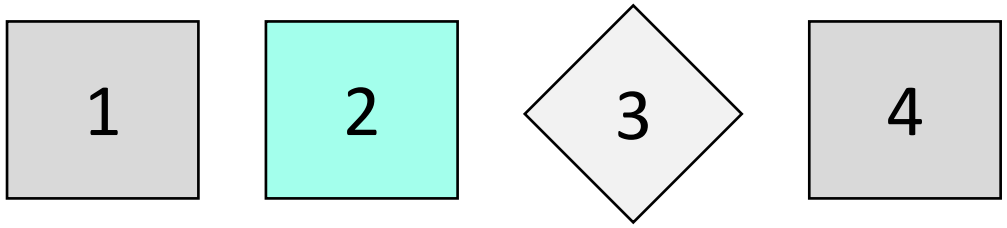


FLOWCHARTING

How to Construct a Flowchart

Identify all major **process activities**, decisions and the sequence of completion

Brainstorm activities and decisions, and write these on sticky notes or on a flipchart

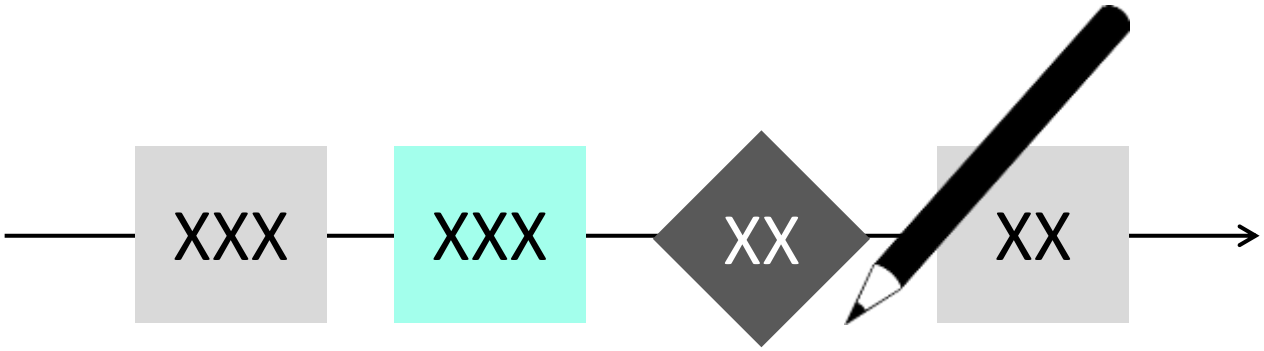


FLOWCHARTING

How to Construct a Flowchart

Draft the flowchart using the standard set of shapes, and **label each step** appropriately

Be consistent in the direction of flow (time may flow from top to bottom and from left to right)

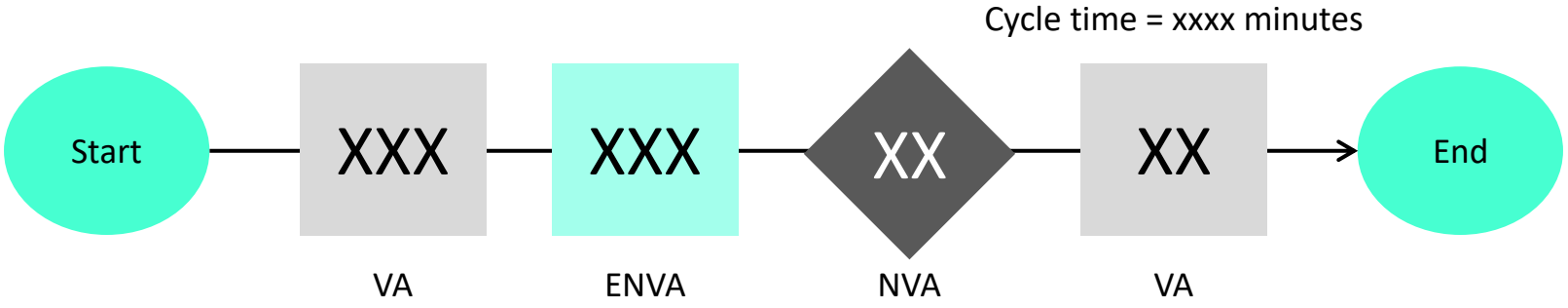


FLOWCHARTING

How to Construct a Flowchart

Prepare the final flowchart, check for missing activities or decisions, and **add further details** as necessary

Test the flowchart to make sure that it represents the process accurately and completely

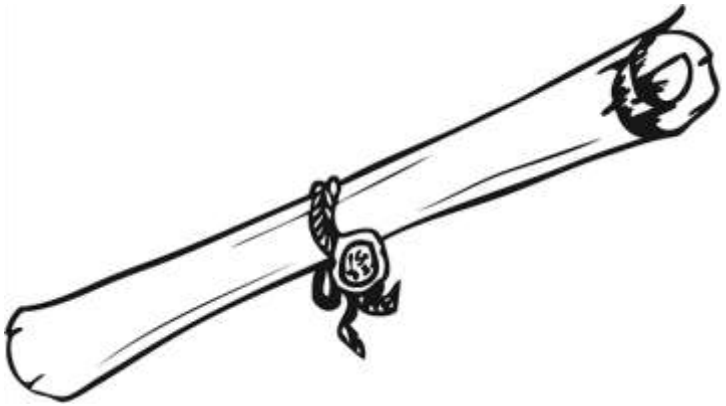


FLOWCHARTING

How to Construct a Flowchart

Publish and **distribute** the completed final version of the flowchart to all concerned

Update the procedures as necessary

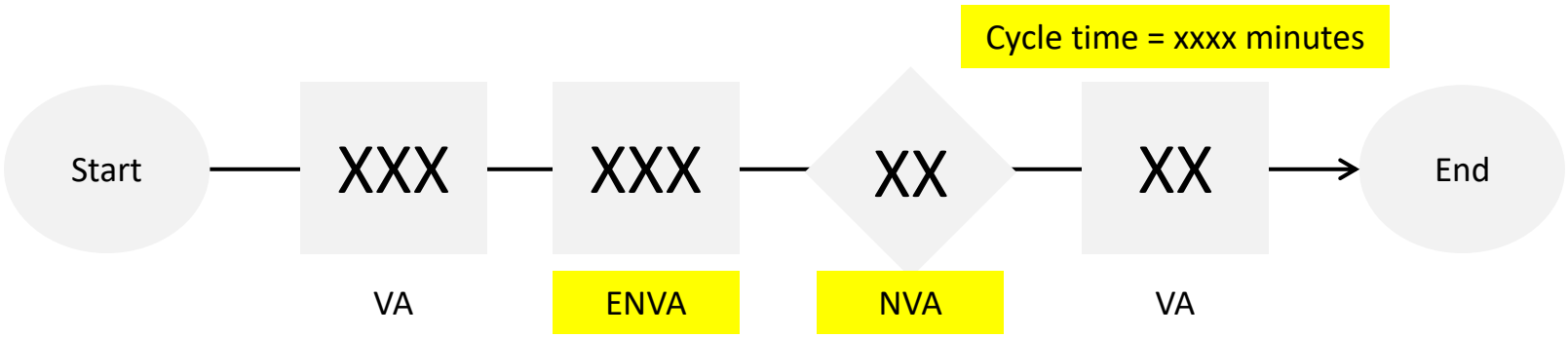


FLOWCHARTING

How to Construct a Flowchart

Identify the areas that hinder the process or add little or no value for further **process improvement**

Plan and implement actions to reduce inefficiencies and waste



FLOWCHARTING

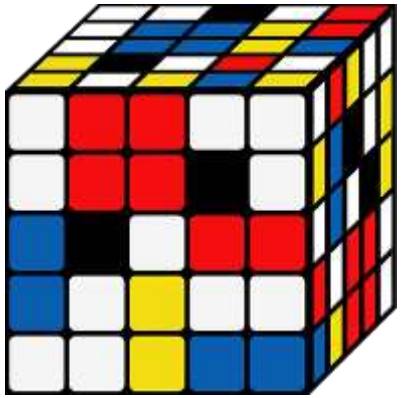
Hint

- Although you can draw flowcharts by hand, it's often more convenient to use any of the drawing applications to create visually appealing flowcharts.
- A good practice is to draft the flowchart on a paper before designing it with software.

FLOWCHARTING

Software Applications and Online Services

- The process of drawing a flowchart can be an **overwhelming** task.
- This is where **applications** and online services can offer the flexibility that a piece of paper can’t.



FLOWCHARTING

Software Applications and Online Services

There are many software applications and online services that allow the creation of flowcharts.

Microsoft Visio

SmartDraw

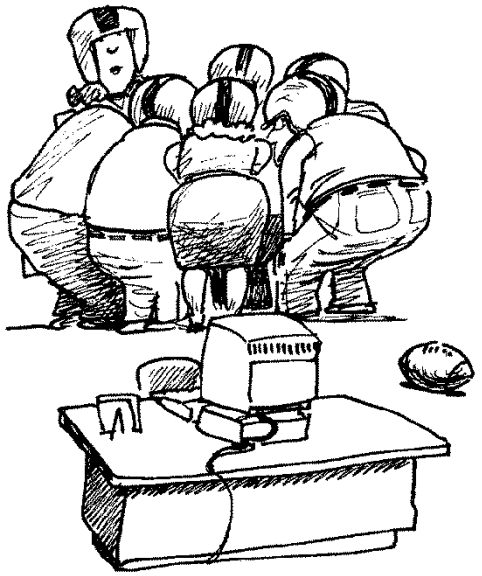
MICROGRAFX®

FLOWCHARTING

Further Information

The exercise of flowcharting your company processes can clarify your and your team's **understanding of the work**.

It's always recommended to **walk the process** before you draw your flowchart to get an overview of the process and identify the boundaries.



FLOWCHARTING

Further Information - **Tips**

Clarify process boundaries	Specify only one result for each activity
Use brief description to describe each activity	Whenever possible start with verbs

FLOWCHARTING

Further Information – **Potential Pitfalls**

- Mapping without a clear purpose
- Lost in the details
- Hidden bias or agenda
- Not verifying the facts
- Not focusing on customers' needs

FLOWCHARTING

Further Information – Questions to Consider

Where does the material or service come from?

Where does the service or material of this activity go?

How do you assess the performance of this activity?

What happens if the activity is under performing?

Who makes this decision?

What happens if the decision is yes / no?

FLOWCHARTING

Further Information – Common Process Problems

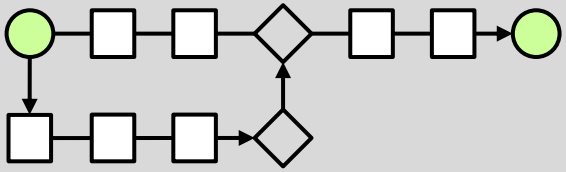
Non-value adding steps	Errors and rework	Duplication
Bottlenecks	Long cycle times	Excessive delays
Missing steps	Too many inspections	Complex procedures
Departure from procedure	Dead ends	Costly steps

FLOWCHARTING

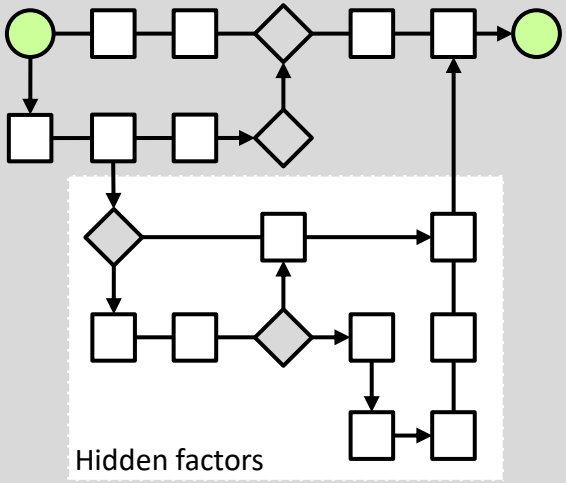
Further Information

What do we think of a process is not necessary what it actually is . . .

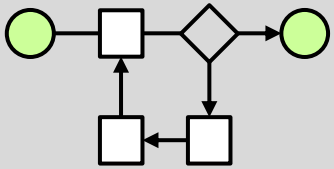
What you think it is



What it actually is



What you would like it to be



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