Contents

Before you begin

This learner guide is based on the unit of competency *BSBCRT404 Apply advanced critical thinking to work processes*, Release 1. Your trainer or training organisation must give you information about this unit of competency as part of your training program. You can access the unit of competency and assessment requirements at: www.training.gov.au.

How to work through this learner guide

This learner guide contains a number of features that will assist you in your learning. Your trainer will advise which parts of the learner guide you need to read, and which practice tasks and learning checkpoints you need to complete. The features of this learner guide are detailed in the following table.

Icon	Feature of the learner guide	How you can use each feature
	Learning content	Read each topic in this learner guide. If you come across content that is confusing, make a note and discuss it with your trainer. Your trainer is in the best position to offer assistance. It is very important that you take on some of the responsibility for the learning you will undertake.
	Examples	These highlight learning points and provide realistic examples of workplace situations.
	Practice tasks	Practice tasks give you the opportunity to put your skills and knowledge into action. Your trainer will tell you which practice tasks to complete.
	Video clips	Where QR codes appear, you can use a smartphone or other device to access video clips relating to the content. For information about how to download a QR reader app or accessing video on your device, please visit our website: www.aspirelr.com.au/help
	Summaries	Key learning points are provided at the end of each topic.
	Learning checkpoints	There is a learning checkpoint at the end of each topic. Your trainer will tell you which learning checkpoints to complete. These checkpoints give you an opportunity to check your progress and apply the skills and knowledge you have learnt.

Foundation skills

As you complete learning using this guide, you will be developing the foundation skills relevant for this unit. Foundation skills are the language, literacy and numeracy (LLN) skills and the employability skills required for participation in modern workplaces and contemporary life.

The following table outlines specific foundation skills noted for your learning in this learner guide.

Foundation skill area	Foundation skill description
Learning	• Reflects on own performance and seeks opportunities to improve own skills and knowledge
Reading	• Interprets, evaluates and extracts relevant information from a range of texts for work requirements
Writing	• Documents key research findings and ideas • Develops clear workplace documents appropriate to audience and context
Oral communication	• Articulates ideas and requirements clearly and persuasively using techniques appropriate to audience and environment • Participates in a verbal exchange of ideas and elicits the view and opinions of others by listening and questioning • Uses a range of persuasive responses and makes comparisons which show an understanding of topics and concepts
Numeracy	• Interprets and critically analyses numerical data to determine work process requirements
Navigate the world of work	• Recognises and considers the implications of legal and regulatory responsibilities on own work • Adheres to implicit and explicit organisational procedures and policies, seeking advice from others if necessary
Interact with others	• Demonstrates sophisticated control over oral, visual and/or written formats, drawing on a range of communication practices to achieve goals • Actively identifies the requirements of important communication exchanges, selecting appropriate channel, format, tone and content to suit purpose and audience • Reflects on personal values, behaviours and assumptions and considers how these might be perceived by others • Looks for ways of establishing connections and building genuine understanding with a diverse range of people

> **Sociocentric thinking**
>
> The motive is to validate the group's way of thinking. For example:
> - It's my friend's birthday and it would mean a lot to her if I went to the party tonight – I will go even though I would prefer not to as I need to be up early tomorrow.
> - I will agree with the team's decision and will not argue against it, even if I think the decision is the wrong one – I have only just joined this team and want to make a good impression.

We are born with a self-centred outlook, and as we grow we develop a more sociocentric view of the world.

Each of these types of thinking is essentially unconscious. By contrast, critical thinking requires conscious effort and must be developed.

Rational and irrational thinking

The human brain uses both rational and irrational thinking, but considers all thinking to be rational.

The following diagram, developed by Elder and Paul, illustrates the different ways the human brain unconsciously relies on irrational egocentric and sociocentric thinking when making decisions. Rational thinking involves conscious decisions, but the mind justifies all decisions as being rational.
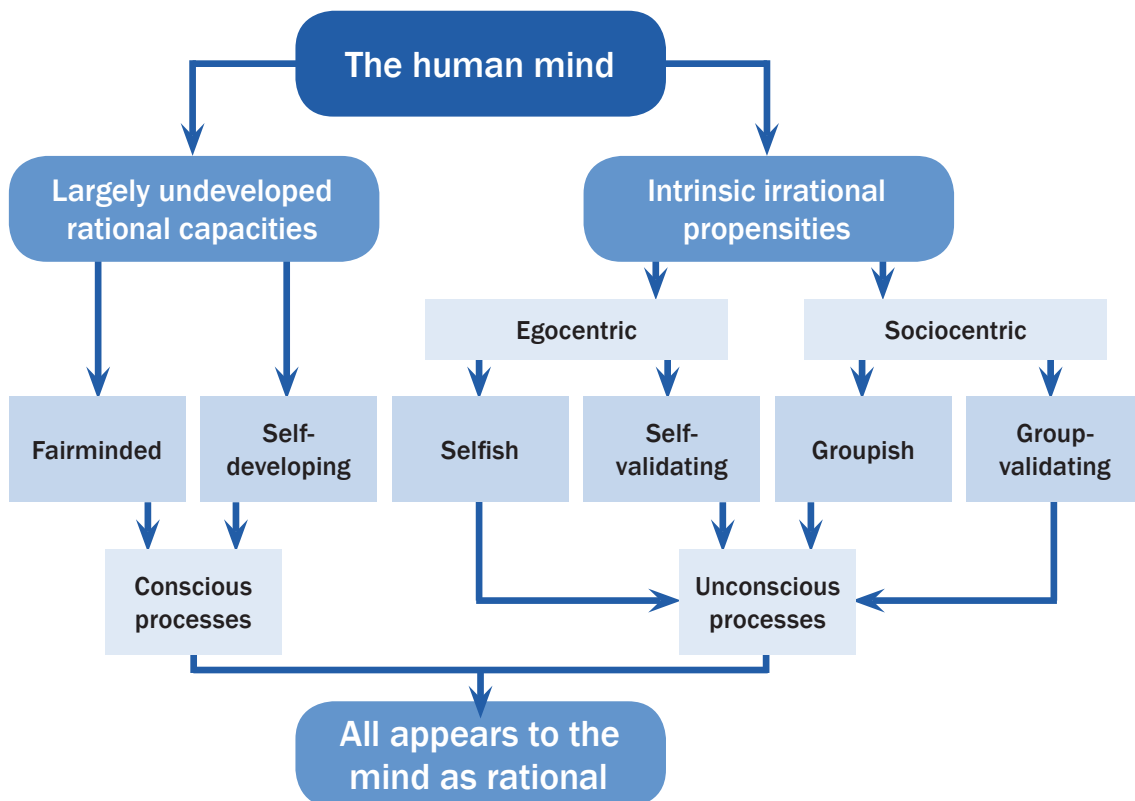
Source: Paul R and Elder L (2013), *30 days to better thinking and better living through critical thinking*, Pearson Education

Consider different perspectives	Identify your point of view and seek the views of others	Be fair-minded when evaluating points of view
Interpret information correctly	Infer only what the evidence implies	Identify assumptions underlying inferences
Develop well-reasoned solutions and conclusions	Conclusions flow logically from inferences	What is the best possible solution/ conclusion?
Test conclusions and solutions against relevant criteria and standards	Test against intellectual standards	Test against organisational criteria and best practice

Adapted from: Paul R and Elder L (2010), *The thinker's guide to analytic thinking*, The Foundation for Critical Thinking

Intellectual standards

Intellectual standards provide a basis for testing your thinking.

Intellectual standards enable you to check the quality of your thinking. They are essentially a series of questions that you should ask yourself at various points in the critical thinking process. There are many universal standards used across different disciplines. Here is a list of standards that are vital if critical thinking is to occur. Paul and Elder suggest the following questions should be asked to determine whether intellectual standards have been applied.

On the morning of the launch, NASA was advised by Morton Thiokol about the O-ring safety concern and advised not to launch. NASA asked Morton Thiokol to review their advice. The Morton Thiokol management team then met with their engineers, who expressed strongly that the launch be postponed because the freezing temperatures might compromise the integrity of the O-ring. The Morton Thiokol management team ignored the advice of the engineers and no one on the management team expressed a concern when they reached that decision. They gave NASA the all clear to launch. Morton Thiokol did not want to disappoint their major client and NASA was under pressure to go ahead with the launch. The concerns expressed by Morton Thiokol engineers to NASA did not make their way to the senior NASA decision-makers.

This video provides a dramatisation of the meeting that took place, from the documentary *Challenger: The untold story.*

Practice task 2

Question 1

List **five** risks of failing to apply critical thinking.

Question 2

Explain how you could apply critical thinking to avoid the following situations in a business:

- having the same range of products and services year after year
- implementing a new process that drives away customers.

Learning checkpoint 1
Thinking critically in the workplace

This learning checkpoint allows you to review your skills and knowledge in understanding how thinking critically is applied in the workplace.

1. What are **four** things you do when you think critically?

2. Why is critical thinking described as rational thinking?

3. How does critical thinking benefit the following groups of stakeholders?
   a. Customers
   b. Shareholders

Topic 2
Critical thinking and decision-making

Decisions help to establish organisations and propel them forward; however, poor decisions can result in loss of productivity or failure to succeed.

Decisions – and the ability to make them – are at the core of all organisations. Applying critical thinking to decision-making means that organisations are more likely to make rational and defensible decisions based on all relevant information.

In this topic you will learn about:

2A   Analysing key elements of workplace procedures, products and services

2B   Using critical thinking to uncover limitations

2C   Sourcing workplace information to guide decision-making

2D   Applying critical thinking to a decision-making framework

Australian and/or international standards may also apply to different industry sectors. Depending on the industry, standards may relate to:

- safety
- construction
- performance
- testing
- labelling
- information.

Example

Analysing key elements of workplace procedures, products and services

ACME Lighting specialises in designing and manufacturing light fixtures and ceiling fans for households. Its vision is to be the leading provider of innovative and technologically advanced lighting and ceiling fans, including producing energy-efficient products.

Its business plan includes goals to increase its share of the ceiling fan market by producing more energy-efficient designs.

Recent data from customer surveys revealed energy costs as a key motivational factor when customers are making purchasing decisions about ceiling fans.

ACME Lighting's latest ceiling fan uses as little energy as 2 cents per hour and can reduce running costs by as much as 20 per cent. The use of new innovative materials means that fans are lighter and quieter than ever before, and the components are more sustainably made by plantation-grown timber and bamboo.

ACME Lighting's product development arm produced a detailed business case describing where the fan would be manufactured, associated manufacturing costs per unit, shipping costs, sustainability manufacturing ratings and prototype testing, including data on energy efficiency and noise ratings.

An analysis of ACME Lighting's decision to develop a new energy-efficient fan reveals that it is:

- aligned to their vision and business plan goals
- fulfilling a customer need
- backed by a detailed business case
- supported by data from prototype testing.

There is information and evidence provided that outlines the critical thinking behind the decision to develop the product.
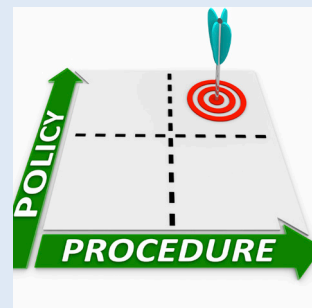
2C | Sourcing workplace information to guide decision-making

Critical thinking depends on gathering relevant and sufficient information.

You are unable to reason without information. The information you use to reason can be based on your experience or the experience of others, or may be based on data and facts. You should exercise caution in deciding which information to use.

For example, how objective can you be when using your own experience as a guide? You are in danger of irrational egocentric thinking if you are not self-critical of your own experience. As Elder and Paul wrote in *The thinker's guide to intellectual standards* (2012): 'Experience may be the best teacher, but biased experience supports bias, distorted experience supports distortion, self-deluded experience supports self-delusion'.
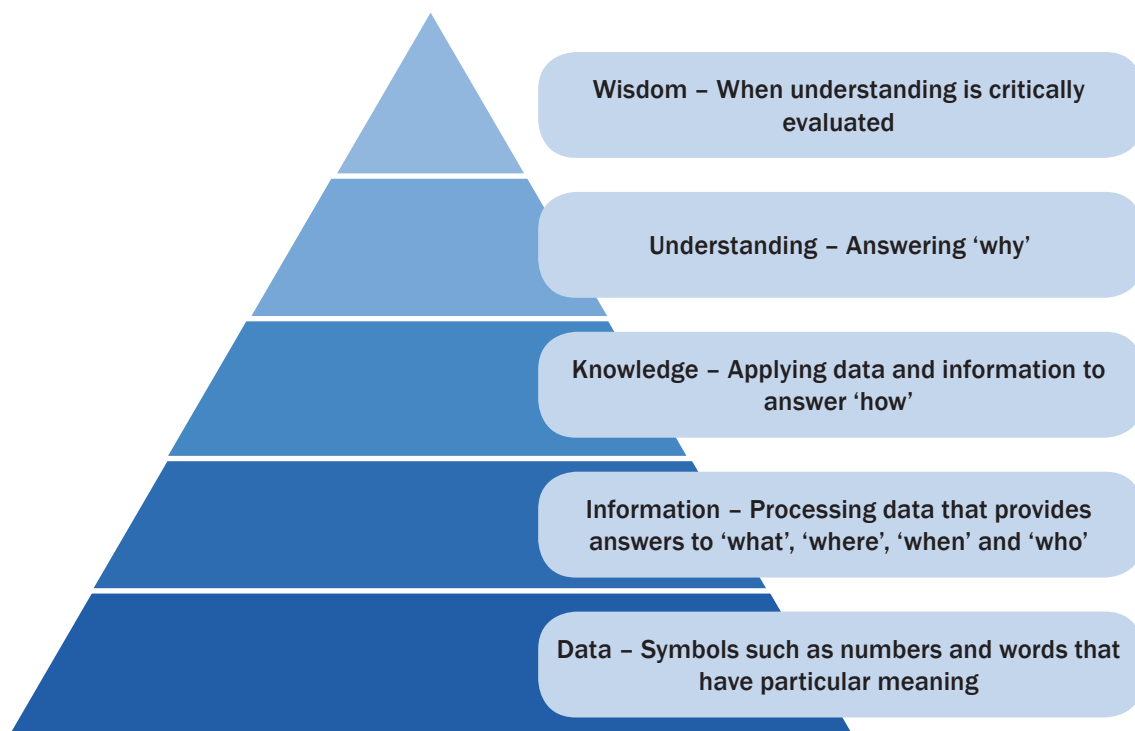
Equally, how willing are we to absorb the group consensus without critically evaluating it? Recall the dangers of 'groupthink' and the space shuttle *Challenger* from Topic 1.

Relevancy and sufficiency of information

The goal in critical thinking is wisdom. The starting point is data and information.

The DIKW Pyramid developed by Russell Ackoff in 1989 makes a distinction between data, information, knowledge, understanding and wisdom.

Wisdom – When understanding is critically evaluated

Understanding – Answering 'why'

Knowledge – Applying data and information to answer 'how'

Information – Processing data that provides answers to 'what', 'where', 'when' and 'who'

Data – Symbols such as numbers and words that have particular meaning

Source: Ackoff, R (1989), 'From data to wisdom', *Journal of applied systems analysis*, vol. 16, p.3–9.

Using critical thinking to make decisions

Critical thinking is involved in each step of the decision-making model.

The table below shows how alternative critical thinking techniques can be applied to the decision-making process to ensure that the process is robust. The following intellectual standards have been included to show how they can be used in the decision-making process.

Steps in decision-making	Critical thinking techniques	Intellectual standards that apply
Identify and agree on the issue or problem	• Analyse the issue • Clarify the issue • Question the information	• **Clarity** – The quality of the decision is improved if all are clear on the issue/problem. • **Precision** – The more precisely you can describe the issue/problem, the more efficiently a solution can be determined.
Gather relevant information	• Analyse the information • Understand the theories or concepts that are used	• **Relevance** – Is the information relevant to the issue/problem? • **Accuracy** – Are you able to verify all information included in the process? • **Precision** – Does the information contain enough facts and details to make it useful? • **Significance** – What is the most significant or important information to aid in decision-making?
List options and solutions for the decision	• Clarify the possible solutions	• **Clarity** – Options and solution must be clear to all. • **Relevance** – Options and solutions must be relevant to the issue or problem. • **Fairness** – Has everyone declared any bias or conflict of interest in relation to the proposed solutions?
Weigh the pros and cons of each option	• Consider different perspectives • Test assumptions • Analyse the options • Question the options	• **Depth** – Which solutions address the complexities of the issue/problem? • **Breadth** – Which solutions address the scope of the issue/problem? • **Logic** – Do the proposed solutions make sense and will they address the core elements of the issue/problem? • **Fairness** – Has everyone declared any bias or conflict of interest in the proposed solutions?

What exactly did he tell you?

He said it was a day late because he received a complaint from them saying so.

Did anyone check that this was correct?

Don't you trust George?

It isn't a matter of trust. It is whether there is any evidence to support their claim that the order was delivered late. Once we are clear on the facts, then we can look into why it happened and find a solution to stop it from happening again.

In the exchange above, Vanessa is using critical thinking to understand what happened. She hasn't begun to understand why it happened. Note the clarifying questions Vanessa asks and how she also clarified her reasons for wanting more evidence. This exchange also highlights the irrational reasoning that was used by Mike ('Don't you trust George?'), which was countered by Vanessa.

Visual communication skills

Visual communication is often used to convey numerical or data-driven information – to quantify and draw inferences based on what the data represents.

When interacting with others and communicating information, you need to select the best method for communicating. Most people have a preference for how they choose to receive information. This may be in spoken, written or visual form.

The information needs to be pitched to the audience and use the right format, tone and content for the group to ensure it will be understood by a diverse range of people.

For example, you can read the following statement: 'This year sales increased by 50 per cent while profit jumped by 72 per cent compared to last year'. However, it can be much more meaningful to prepare a chart showing growth of revenue and profit over time, like the one below.

Revenue and profit growth
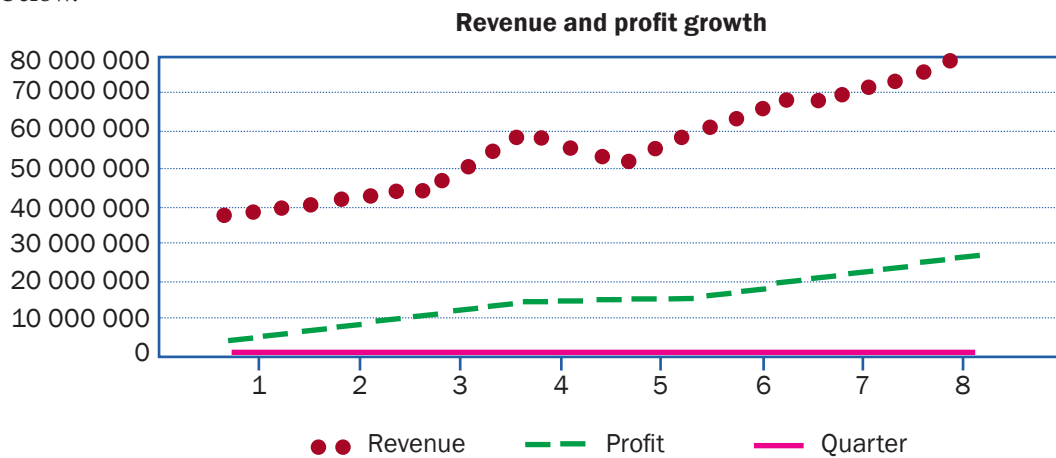
Asking critical thinking questions

A verbal exchange involves an exchange of ideas, which means that the views and opinions of others need to be obtained and responded to.

Elder and Paul distinguish three types of questions that occupy the critical thinking landscape, as outlined here.

Judgment

- Answers will vary.
- Involves seeking the best answer within a range of possibilities.
- Requires evidence and reasoning.
- Answers are evaluated using intellectual standards.

Preference

- May lead to a subjective opinion.
- There are as many answers to a question as there are different human preferences.
- No evidence or reasoning is required.

Slippery slope	This is an argument that requires us to believe that incremental causal changes will likely happen if we make certain decisions. These arguments can lead us to believe that some decisions will result in changes for the worse without sufficient evidence that the changes are likely to actually happen.
One-sidedness	This type of argument presents reasons to believe something while ignoring or marginalising the reasons against believing it. It is also known as selective evidence, in which information or facts are cherry picked and quoted out of context.
Justification	This method uses evidence or reasons to convince others to believe something. Observation, self-evidence, intuition and appeals to authority are examples of justification.

Writing a proposal

Applying critical thinking to a decision-making process may lead you to an optimal solution, but you have to be able to convince others to implement it.

You may have to present your information to others to obtain their approval to proceed with the proposal. It is likely there will be policies and procedures that need to be followed to seek and obtain approval. Organisational policies and procedures provide guidelines for your proposal.

Different organisations have preferred formats for receiving information to make a decision. For example, a proposal may require you to set out the 'thinking journey' you and your colleagues have gone on to arrive at your solution. In showing how you arrived at your solution, you are putting forward an argument to convince others to grant you and your team permission to implement it.

A proposal may consist of the following steps:

Step 1   Give details of those involved in making the decision.

Step 2   Clarify the issue on which the decision was based.

Learning checkpoint 2
Critical thinking and decision-making

This learning checkpoint allows you to review your skills and knowledge in applying critical thinking to decision-making.

1. List **three** key elements for products and services to be successful.

2. List **three** things customers need to know about a product or service.

3. List **three** key elements of workplace procedures.

4. Name **three** areas of an organisation that are impacted by legislation. For each area, give **two** examples of specific legislation that may apply.

Topic 3
Evaluating the effectiveness of critical thinking

An important component of critical thinking is being able to evaluate the decisions that were reached.

Thoughts lead to action. There is an expectation that effective thinking leads to effective action. But what if it doesn't? Does this mean the thinking is at fault? Were there other factors outside the thought process that impacted the outcome?

Reactive organisations are more likely to work normally until they are forced to react to something that causes them to re-evaluate their decisions, and to re-evaluate the thinking that led to those decisions. Proactive organisations make it a habit of evaluating their thinking as a matter of regular practice as they understand this will lead to fewer surprises and they will have increased resilience to adapt to things when they go wrong.

In this topic you will learn about:

3A   Reviewing the effectiveness of decisions
3B   Self-reflection and self-development
3C   Planning for future process evaluations

Seek feedback from management

Managers are routinely required to make decisions and should be modelling a critical thinking mindset.

Managers can provide valuable feedback on the effectiveness of individual decisions and the process by which they were made. They can also provide feedback on the critical thinking culture of the organisation. Always follow the governance rules, such as consulting with the senior decision-maker in the company.

Organisations may go through a maturation phase in which the use of critical thinking moves from guarded acceptance to business as usual. This is outlined in the following diagram.

Critical thinking occurs
routinely

The value of critical
thinking is apparent

Guarded acceptance
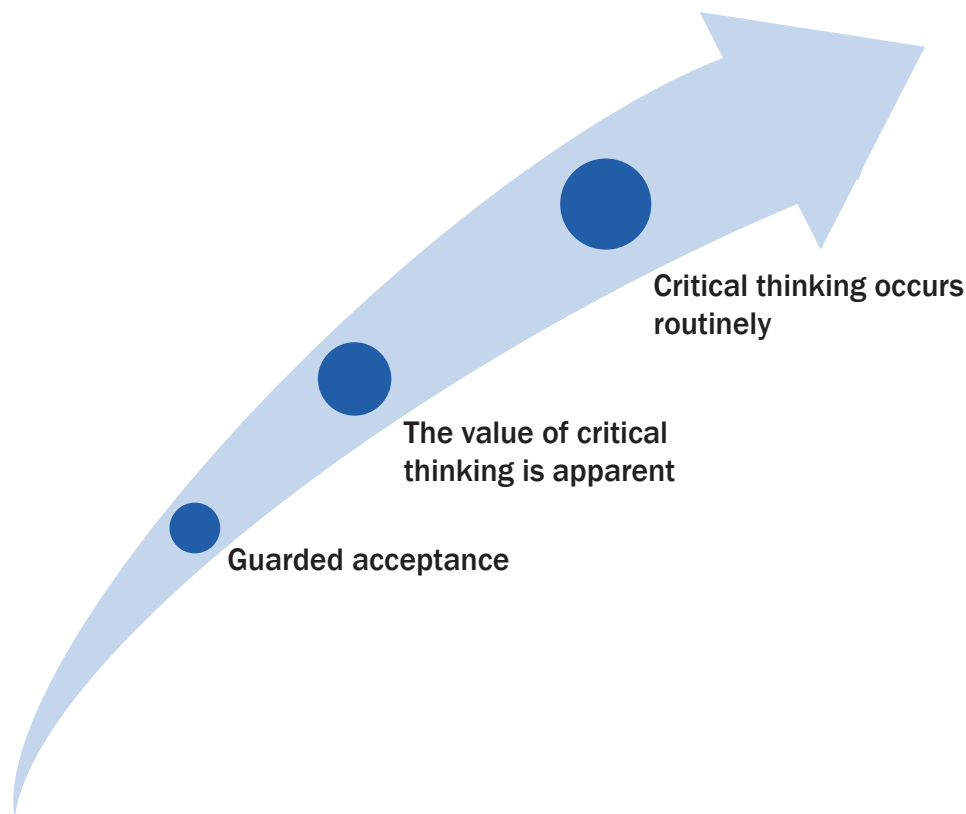
Managers can also provide you with feedback on your decision-making ability and how you have applied critical thinking.

Management feedback should be used as part of any review of a decision's effectiveness. Some of the feedback from a manger may relate to your skills in:

- questioning
- reasoning
- adhering to processes, policies and procedures
- including stakeholders with a diversity of views
- communication skills
- demonstrating empathy and understanding of others.

Johari Window

The Johari Window was created by Joseph Luft and Harry Ingham and describes the extent to which someone discloses aspects of themselves to others.

It consists of the following:

- Open/free area – contains things (behaviours, attitudes, feelings, emotions, skills, etc.) that are known to the individual and others.
- Hidden area – contains things that are known to the individual, but not to others.
- Blind area – contains things that others are aware of about an individual, but the individual is unaware of.
- Unknown area – contains things that are not currently known to the individual or others.

The Johari Window is useful for self-reflection and understanding how open you are to others and how willing you are to take on feedback during the decision-making process. It also allows you to reflect on the openness of your colleagues during decision-making and whether knowing more about them would help in the process.

In order to gather different perspectives of a solution/problem, you need the cooperation and openness of others.
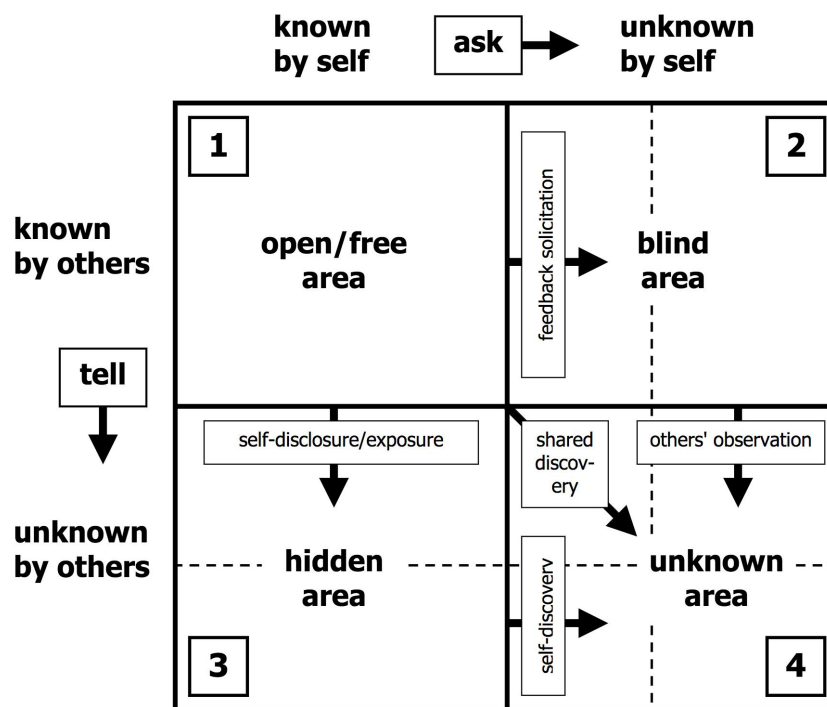
Source: Luft, J. and Ingham, H. (1955), 'The Johari window, a graphic model of interpersonal awareness', *Proceedings of the western training laboratory in group development,* University of California

Asking why

Another self-reflection technique is simply asking 'Why?' For example:

- Why did I feel this way?
- Why did I take that action?
- Why did I say what I did?
- Why do my ideas and beliefs differ from others?

Example

Self-reflection and self-development

Miguel asks for feedback from his manager on where he can improve his critical thinking. He recently led a decision-making session and asks his manager to rate his performance in specific areas and to provide him with feedback on what he was doing well and where he could improve. He gives his manager the following template to complete.

Area	What is done well	What could be further developed
Checking accuracy		
Uncovering assumptions		
Interpreting information correctly		

Miguel's manager gives the following feedback.

Area	What is done well	What could be further developed
Checking accuracy	You are very good at focussing on the detail and asking questions to clarify meaning.	You should check the accuracy of more of the information. You have a tendency to focus on what you think is important.
Uncovering assumptions	You work well with the group when questioning others about their assumptions. You make sure you engage everyone in the group and they seem to enjoy the challenge.	You need to spend more time looking at the assumptions that drive your own thinking and making those plain for the group. Perhaps some coaching in this area would be good to help you deconstruct your thinking and what is shaping it.
Interpreting information correctly	This is a strength of yours. Your attention to detail means you naturally want to ensure that everyone is interpreting the information in the same way. Your questioning is very good.	You need to include more detail in the solution that you propose. If the solution is too vague then it is open to interpretation and we could end up with a result we don't want.

Miguel arranges with his manager for several coaching sessions on uncovering his assumptions. He also receives specific feedback on checking accuracy after making changes to his questioning regime and running a further decision-making session.

Scope of the evaluation

When determining the scope of the evaluation, an important consideration is how broad the evaluation should be and how deep it should go.

Consider the order fulfilment process from the previous topic.

Inventory handling → Warehouse management → Order processing

Order processing → Packing and shipping

Packing and shipping → Accept or return → Order fulfilled
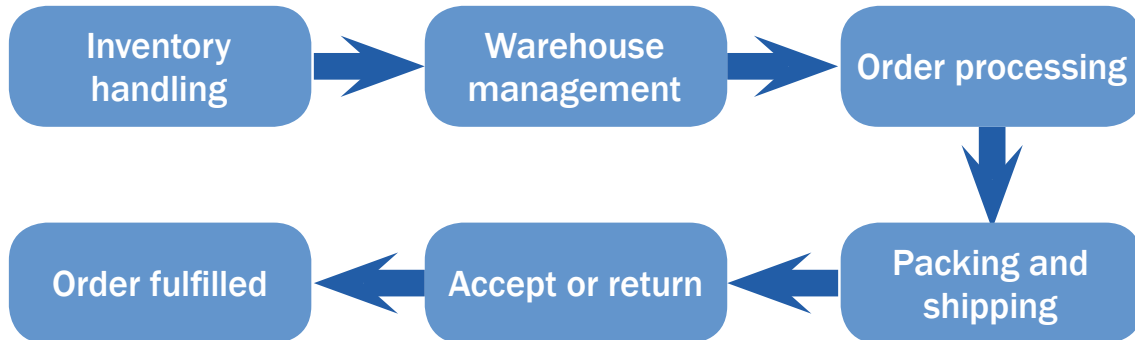
Because of time constraints, it may be unmanageable to evaluate the entire process in detail. So how do you know what to focus on?

Customer feedback and feedback from key metrics may indicate that you should evaluate just part of the process. An alternative may be to split the evaluation between teams, then combine the results at the end.

For example, if customer feedback was mainly negative about the company's return policy, you could focus on that. But what if feedback was on damage to goods being shipped? Where would it be best to focus your attention? The choices may be warehouse management or packing and shipping.

Who should be involved?

You need to consider which stakeholders should be part of the evaluation process.

A good place to start is to ask who is impacted by the process or the part of the process you are evaluating. This could be:

- those directly involved in implementing the process
- those monitoring the performance of the process
- those supplying resources for the process
- people directly upstream or downstream from the process
- people who evaluate the process as part of an overall strategy.