Student workbook

Cluster | ICT Analysis

BSBCRT404 | Apply advanced critical thinking techniques

ICTICT426 | Identify and evaluate emerging technologies and practices

ICTSAS432 | Identify and resolve client ICT problems

***TAFE NSW would like to pay our respect and acknowledge Aboriginal and Torres Strait Islander Peoples as the Traditional Custodians of the Land, Rivers and Sea. We acknowledge and pay our respect to Elders, past, present and emerging of all Nations.***

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Get started

## What will I learn?

This workbook covers the units of competency:

* BSBCRT404 - Apply advanced critical thinking to work processes
* ICIICT426 - Identify and evaluate emerging technologies and practices
* ICTSAS432 - Identify and resolve client ICT problems

Successfully completing these units will give you the skills and knowledge to:

* use advanced critical thinking skills in a workplace context
* investigate, identify and evaluate emerging technologies and practices in the information and communications technology (ICT) industry, assess their impact on an organisation and develop strategies to prepare for implementing them
* identify, record, prioritise and resolve client ICT support activities, escalating where required.

In this workbook, you will learn to:

* understand critical thinking in a workplace context
* apply a systematic approach to decision-making
* develop a critical thinking mindset
* identify emerging technologies and practices in IT
* evaluate the impact of emerging technologies and practices
* develop strategies to prepare for emerging technologies and practices
* prepare to resolve client ICT problems
* prioritise client ICT problems
* refer problems where required
* carry out maintenance
* create maintenance report
* confirm problem resolution.

Each topic includes opportunities to check your progress and understanding as well as practice activities that will prepare you for the formal assessments. Answers and feedback for the activities are at the end of this document.

There are 5 topics to complete within this workbook. They are:

1. Working in ICT
2. Critical thinking in the workplace
3. Emerging technologies and practices
4. ICT professional skills
5. Working in ICT support

If you are using a printed version of this workbook, links and URLs are in a table at the end. Type the URL into your browser to go to the link.

Alright, let’s get started!

## Icon legend

Table 1 Icon legend

|  |  |
| --- | --- |
| Icon | Description |
|  | **Practice activity**  Complete these learning activities as they will help you to gain the knowledge and skills you need to complete your assessments. |
|  | **Collaboration**  Take up opportunities to collaborate with others during your study. This could involve group activities such as mini-projects or discussions where you explore and expand your understanding of the content. |
|  | **Self-check**  Complete these activities to check your learning progress. They help you identify where you may need to go back and revise your learning. Mark off the tasks you have learned. |
|  | **Resources**  Review resources that will enhance your learning and help you with your assessments. |
|  | **Assessment task**  Complete the relevant assessment tasks soon after you have completed the related topic. |
|  | **Video**  Review videos for task demonstrations and to gain a deeper understanding of job roles and concepts. If you are using a printed version, you may need to type the URL into your browser. |
|  | **Library guide**  Access these guides for additional resources to help you with your learning and assessments. |

Topic 1: Working in ICT

## Overview

In this topic you will find out about the common policies, procedures and laws that set the standards for working in the IT sector.

In this topic, you will learn to:

* work in the information and communications technology sector
* complete tasks, make decisions and solve problems according to organisational policies and procedures
* comply with legislation and regulatory obligations.

## Information and Communications Technology

The Information and Communications Technology (ICT) industry is a rapidly growing field that encompasses a wide range of technologies and services, such as computer hardware and software, networking, cybersecurity, database management and programming.

The ICT industry offers a wide range of employment opportunities across various sectors, including the following:

Table 2 Employment opportunities

|  |  |
| --- | --- |
| Employment opportunities | Description |
| Service or help desk | This provides technical support and troubleshooting assistance to individuals and organisations using ICT systems and software |
| ICT Systems Support Team | This provides technical assistance and troubleshooting for various ICT systems used within an organisation. They help ensure that these systems are running smoothly and efficiently, addressing any issues or concerns that may arise. |
| Cybersecurity | This is all about protecting computer systems, networks and data from unauthorised access or attacks. Professionals in this field work to identify vulnerabilities, implement security measures and respond to incidents to ensure the safety and integrity of digital assets. |
| Database Management | This is a crucial aspect of information technology, involving the organisation, storage and retrieval of data to ensure its accuracy and accessibility. Database managers use various software tools to design, implement and maintain databases, ensuring that data is secure, structured and readily available for users. |
| Network Administration | This involves managing and maintaining computer networks, ensuring their smooth operation, security and optimal performance. Network administrators handle tasks such as network setup, troubleshooting, monitoring and configuration of network devices. |

## Policies and procedures

In your role in the industry, you will perform your activities following operational policies and procedures. Organisations develop policies and procedures to govern the way the organisation operates.

Policies and procedures are commonly published on the organisation’s intranet or in a printed form so that they are easily accessible by employees.

Regularly, the policy framework is reviewed to ensure policies and procedures are up to date, meeting the organisation's and stakeholders' requirements and are sufficiently flexible to adapt to changing legislation, systems, technologies and practices.

Policies, procedures and processes support the organisation to:

* manage internal operations
* develop operational efficiencies
* work effectively with suppliers and vendors
* make good decisions
* comply with legislative and regulatory obligations
* ensure tasks are performed in a standardised way
* ensure everyone knows what they’re expected to do
* manage contingencies
* ensure efficiency and quality so productivity remains high.

### Organisational objectives

Organisations have objectives or goals to set medium to long term targets for the organisation to work towards. Objectives focus efforts and increase the chance of successful operations.

The organisation may also have objectives related to emerging technologies and practices.

Plans that implement the objectives will include:

* the digital tools and resources that will be used in the organisation
* the people responsible for overseeing the digital strategy within the organisation
* details of any customer and security considerations.

Practice activity

### Activity 1: Organisational objectives

Read the guiding principles of Gelos Enterprises’ [ICT Governance Policy (pdf)](https://share.tafensw.edu.au/share/items/5f1cec7b-1d03-446a-85b7-edb42692c34e/0/?attachment.uuid=7041aeea-1a17-4f66-839d-f96f5c24d143) and select the correct answer.

1. Select **3** examples of organisational objectives related to **emerging** technologies and practices.

|  |  |  |
| --- | --- | --- |
| # | Choices | Answer/s |
|  | ICT systems and changes should support Gelos in its core business |  |
|  | Gelos will broaden our client base in the next five years |  |
|  | Gelos will improve operational efficiency through ICT systems |  |
|  | Gelos policies and procedures will align with socially sustainable work practices |  |
|  | All ICT systems and technologies must be secure |  |

### Policies

Policies are the guidelines that are developed by the business to help govern how it functions. You will perform your job role in accordance with organisational policies.

Common policies include:

* privacy and confidentiality
* anti-discrimination
* records management
* customer service
* recruitment, selection and induction
* remote working
* environmental sustainability
* ICT governance
* communication.

Resources

Access the simulated organisation, [Gelos Enterprises](https://share.tafensw.edu.au/share/items/d0b458dc-3922-409d-b1fe-9a2f785f4a38/0/?attachment.uuid=5f1677bf-8296-4137-ae33-8b9e30bad1ab), to learn more about the range of policies that apply to your role in ICT.

### Procedures

Procedures implement the policies. Procedures include the details of the tasks and employees required to implement a policy. Procedures ensure:

* work activities are performed in a consistent and standardised manner
* duties and responsibilities related to the procedure are allocated to specific job roles
* the organisation is compliant with laws, regulations, standards and organisational requirements and obligations.

Common ICT procedures include:

* performing a backup
* updating programs and applications
* manual handling
* WHS emergency and evacuations
* ICT disposal and storage
* ICT maintenance
* technology start-up and shut down
* cyber security
* risk management.

#### Components of procedures

Organisations will have their own required procedure format. The following procedure format is given as a guide:

* Organisation name and logo
* Title or name of procedure
* Introduction: A statement of why this procedure is required
* Purpose: A specific statement about the purpose of the procedure
* Scope: A statement of who the procedure applies to
* Procedure: Procedure instructions may include numbered steps or bullet points, graphics such as images or charts that help describe in more detail, checklists, processes and so on
* Related documents: List of policies, procedures, standards, laws and regulations associated with the procedure
* Version control: Version number and date of issue.

Resources

* Download and review Gelos Enterprises’ [Standard Operating Procedure Template (docx)](https://share.tafensw.edu.au/share/items/02285ff1-cfb2-4af4-b402-fdc23bf4bf11/0/?attachment.uuid=21046ae5-03d8-4725-9ccc-2a287e2eb913).
* Review Gelos Enterprises’ other [Forms and Templates](https://share.tafensw.edu.au/share/items/d0b458dc-3922-409d-b1fe-9a2f785f4a38/0/?attachment.uuid=aa9bb643-d101-45be-9b0f-533c4cc33ba1), including their [Policy Template (dotx)](https://share.tafensw.edu.au/share/items/02285ff1-cfb2-4af4-b402-fdc23bf4bf11/0/?attachment.uuid=d4fbbddb-3d0e-4b24-bd1a-d448550d82ab) to learn more about how an organisation standardises is procedure formats.

The content of procedures is sourced from the following:

* existing policies and procedures
* internal and external experts and users
* technical specifications from vendors and manufacturers
* industry standards, laws and regulations
* government regulators.

Practice activity

### Activity 2: Purpose of policies and procedures

In the Dove Recruitment video, [Why you need Workplace Policies & Procedures](https://www.youtube.com/watch?v=rYQZskPrBWQ) [YouTube, 01:56 min], the presenter outlines the importance of policies and procedures in an organisation. Play the video and then answer the questions below.

1. Read each statement, then write **true** or **false** in the space provided.

|  |  |
| --- | --- |
| Questions | True or False |
| 1. Policies act as a guideline for all decisions made in an organisation and ensure operational tasks meet the legislative requirements relevant to your industry |  |
| 1. Procedures explain how to perform day-to-day tasks in line with the organisation’s policies |  |
| 1. Policies and procedures are unrelated to legal compliance |  |

### Limitations of procedures

Procedures use a clear structure and are much more specific than policies. Whereas policies are not easily changed, procedures and processes can be changed according to requirements and usually undergo continuous improvement as required. For example, if a software application is upgraded, the procedures used with this application would be revised. However, this continuous improvement and review process can take time and resources to prepare, approve and document.

Although standardisation may have been implemented according to organisational needs, the organisation and its employees may outgrow a set of procedures or processes. The success of the procedures and processes depends on how closely they reflect what is happening in reality. Changes in the legal environment, new technologies and the performance of tasks inevitably lead to some procedures becoming less relevant. It is important that procedures and processes be updated as required.

Procedures may also stifle creativity, especially when they become dated and inflexible. The structure of the procedures and how these interact with other parts of the organisation may stifle innovation, collaboration, or an understanding of how the procedures align. This can make the organisation less competitive and responsive to changes in the business environment. Procedures that are too rigid may not allow for any flexibility or opportunities to trial new ways of working. This may inhibit skills development and lead to decreased job satisfaction and low employee morale.

### Implicit policies and procedures

Most policies are **explicit:** they are formally recorded in an organisation’s intranet and handbook.

**Implicit** policies and procedures are not recorded but represent common practices that are the norms in the organisation, such as team members have a morning tea break together, even without a formal tea break policy.

Because implicit policies and procedures are not written, they are more difficult to challenge. Where an implicit practice is negative, it may result in anti-social behaviour or group pressure to take shortcuts in work tasks.

When solving workplace problems, explicit and implicit policies and procedures must be considered.

## Legal responsibilities

When using critical thinking and problem-solving processes to evaluate ICT processes, products and services, you must recognise and consider the implications of legal and regulatory responsibilities and requirements.

In this section, key legislative requirements relating to workplace procedures will be summarised.

### Copyright

Emerging technologies and practices in the IT industry have created challenges around identifying and protecting intellectual property. As a result, we have a greater responsibility to understand and comply with the laws designed to achieve this. In Australia, copyright protections are covered by:

* Copyright Act 1968
* Copyright Regulations 2017.

Copyright protects the original way an idea or information is communicated, including visual images, sound recordings and computer programs.

Organisations must protect their copyright and ensure they do not breach other's copyright when creating content. ICT governance, communications and social media policies and procedures will include copyright provisions.

Resources

The Australian Attorney-General's Department regulates copyright law and provides information on [Copyright basics](https://www.ag.gov.au/rights-and-protections/copyright/copyright-basics).

Video

Review these [5 common copyright myths](https://www.youtube.com/watch?v=PgZdVD1JGGE) (YouTube, 2:58 min).

### Privacy

Another important legal issue in the ICT sector relates to privacy. The nature of information technology is that data and information are constantly being managed, manipulated and stored. Frequently, this data doesn't belong to the person or entity handling the information. For example, many businesses will capture personal details associated with their customers. Organisations in Australia need to comply with the Privacy Act 1988 and other relevant legislation relating to Privacy, or they may have to pay fines.

The Notifiable Data Breaches (NDB) scheme (under the Privacy Act) established 13 Australian Privacy Principles (APP) that applicable Australian organisations (known as APP entities) must comply with.

You should be familiar with the NDB Scheme and understand:

* when to report a notifiable data breach
* what reporting is required
* who needs to be informed and how (OAIC and affected individuals).

Organisations develop policies and procedures such as data protection to implement privacy legal requirements.

Resources

* To find out if your organisation is an entity covered by the NDB scheme, review the description of [APP entities](https://www.oaic.gov.au/privacy/privacy-guidance-for-organisations-and-government-agencies/preventing-preparing-for-and-responding-to-data-breaches/data-breach-preparation-and-response/part-4-notifiable-data-breach-ndb-scheme#entities-covered-by-the-ndb-scheme) by the Office of the Australian Information Commissioner.
* The [Australian Privacy Principles – a summary for APP entities (pdf)](https://www.oaic.gov.au/__data/assets/pdf_file/0020/1289/app-quick-reference-tool.pdf) explains the 13 principles.
* Review Gelos Enterprises’ [Data Protection Policy (pdf)](https://share.tafensw.edu.au/share/items/5f1cec7b-1d03-446a-85b7-edb42692c34e/0/?attachment.uuid=825c6959-8447-4007-8839-2d9b69dbde74) as an example of organisational compliance with privacy laws.

Practice activity

### Activity 3: Report a data breach

Read the question and select the correct answer.

1. When must an organisation report a data breach?

|  |  |  |
| --- | --- | --- |
| # | Choices | Answer/s |
|  | When there is unauthorised access to or unauthorised disclosure of personal information, or a loss of personal data, that an organisation holds |  |
|  | When the breach may result in minor harm to one or more individuals |  |
|  | When an organisation has been able to prevent the risk of harm from the breach with remedial action |  |

### Work, health and safety (WHS)

Regardless of the industry in which you work, legal requirements stipulate the requirements for establishing a safe work environment.

The Work Health and Safety Act 2011 describes the general requirements to ensure a safe and healthy workplace. It is also designed to reduce illness and the number of injuries in the workplace by imposing responsibilities on employers, employees and others. Those responsibilities are usually implemented through consultative processes within the workplace.

Workplace health and safety obligations include:

* establishing hazard management to identify specific workplace hazards
* establishing and maintaining a system for managing workplace health and safety
* understanding and applying the duty of care responsibilities
* developing a written safe operation procedure manual
* establishing a workplace health and safety record-keeping system
* developing and implementing procedures to evaluate and review the effectiveness of risk control measures.

[SafeWork NSW](https://www.safework.nsw.gov.au/legal-obligations) provides in-depth information on obligations for employers and workers under work health and safety legislation.

### Environmental sustainability

Have you ever considered the environmental sustainability practices relevant to the ICT industry?

Sustainability has become a strategic issue for organisations as they position themselves as good corporate citizens.

Turning sustainability into opportunities that benefit the business rather than expensive burdens means organisations can operate more sustainably and, at the same time, more profitably with considerably reduced risk exposure.

#### Benefits of sustainability policies and procedures

Sustainable and environmental management offers many benefits to an organisation. These include:

* reducing the impact of the organisation's operations on the environment
* lowering the organisation's carbon footprint
* increasing profitability through more efficient work practices
* using less energy, water and raw materials and spending less money
* gaining a good reputation through compliance with legislation and international standards
* improving workplace conditions through reduced use of toxic materials and hazardous chemicals
* improving community relations
* gaining market advantage
* having innovation leading to enhancements of products or services
* changing the organisation's culture
* increasing employee understanding of sustainability issues and satisfaction.

Immediate savings can be obtained by simply ensuring that all equipment is effectively maintained to optimise efficiency and that all employees are familiar with efficiency practices, such as:

* switching off lights and monitors after hours
* automatic shutdown or hibernation-mode processes
* purchasing low energy use equipment
* separating recyclables
* minimising waste
* storing and disposing of used components according to organisational environmental guidelines
* reducing corporate travel, especially travel on planes
* less printing of paper documents.

Collaboration

### Activity 4: ICT sustainability

In groups, on a forum or through brainstorming, think about and share ideas to improve the environmental sustainability of your industry and organisation. Can some of your actions in your home environment be applied at the workplace?

Everyone involved in work, including managers, supervisors, employees, contractors and subcontractors, need to be aware of the environmental laws that apply to the workplace. Understanding environmental laws and the potential of the organisation to affect the environment and the community enables managers to manage risk.

Some of the legislation, regulations and codes that apply include:

* Australian Packaging Covenant
* Corporations Act 2001 (Cth)
* Environment Protection and Biodiversity Conservation Act 2016 (Cth)
* NSW Environmental Planning and Assessment Act 1979
* NSW Protection of the Environment Operations Act 1997
* Waste Avoidance and Resource Recovery Act 2001
* Work Health and Safety Act 2011.

International guidelines include:

* Organisation for Economic Cooperation and Development (OECD) Sustainable Development Goals
* International Organization for Standardization, ISO 14000 family – environmental management
* United Nations International Sustainable Development Goals.

Resources

[Charles Sturt University](https://www.csu.edu.au/sustainability/life-framework/facilities-and-operations/sustainable-ict-what-you-can-do) explains its actions and practices to increase sustainability in the use of ICT equipment and processes.

Practice activity

### Activity 5: Environmental sustainability

Read the question and select the correct answer.

1. Select **3** ways an organisation can show commitment to environmental sustainability in ICT.

|  |  |  |
| --- | --- | --- |
| # | Choices | Answer/s |
|  | Set objectives and targets to reduce the environmental impact of ICT activities |  |
|  | Use critical thinking approaches to understand the work activities that impact the environment, such as the use of resources, the impact of emissions and environmental hazards |  |
|  | Develop procedures for the maintenance, storage and disposal of ICT components |  |
|  | Plan to build awareness of sustainability of employees in 10 years’ time |  |
|  | Turn off the power to all premises nightly |  |

### Accessibility

In a digital context, **accessibility** means accessing and interacting with digital content. **Usability** refers to whether your product is easy to use and intuitive.

Users with accessibility requirements may need some adjustments or use assistive devices to access digital content. This includes finding information on a website, filling in an online form or using an app to navigate. Organisations are driving users to access forms and information directly online. These organisations should ensure that their content is accessible for all users and provide alternative ways of accessing their services if the online version does not allow interaction for users with accessibility requirements.

Video

The video [What’s the difference between usability and accessibility](https://www.youtube.com/watch?v=Nn7G4Wnn5XM&t=43s) (YouTube, 1:18 min) describes some testing methods.

Resources

Several organisations act as advocates for accessibility principles in design. In Australia, legislation and policy are in place to help and guide organisations to meet accessibility principles. However, a lot of internet content remains inaccessible.

The organisations listed are leaders in accessibility advocacy and have very good information and resources, particularly about designing for accessibility:

* [Centre For Accessibility Australia](https://www.accessibility.org.au/)
* [Interaction Design Foundation – What is Accessibility](https://www.interaction-design.org/literature/topics/accessibility)
* [Centre for Inclusive Design – Inspiration series page](https://centreforinclusivedesign.org.au/index.php/inspiration-series/).

#### Web Content Accessibility Guidelines

The Web Content Accessibility Guidelines (WCAG) 2.1 is a set of technical specifications used to test digital content on websites and mobile devices.

12 guidelines are organised under 4 principles:

* **Perceivable**: information and user interface components must be presentable to users in ways they can perceive.
* **Operable**: user interface components and navigation must be operable
* **Understandable**: information and the operation of the user interface must be understandable
* **Robust**: content must be robust enough that it can be interpreted reliably by a wide variety of user agents, including assistive technologies.

### Equal opportunity and anti-discrimination

In Australia, federal, state and territory laws protect people from discrimination and harassment.

The Australian Human Rights Commission provides a quick [guide to Australian discrimination laws.](https://humanrights.gov.au/our-work/employers/quick-guide-australian-discrimination-laws)

Discrimination in employment, education, access to premises and the provision of goods and services is prohibited on the basis of race, colour, sex, religion, political opinion, national extraction, social origin, age, medical record, criminal record, marital or relationship status, impairment, mental, intellectual or psychiatric disability, physical disability, nationality, sexual orientation and trade union activity.

#### The ICT sector

Women are under-represented in the ICT workplace. A recent report commissioned by the [Australian Computer Society](https://www.acs.org.au/insightsandpublications/reports-publications/promise-of-diversity.html) showed that the participation rate for women in all ICT occupations was 28%, compared with 45% across all professional industries.

It also found a significant difference in the average earnings of male and female ICT workers in Australia, with an average pay gap of around 20% across all ICT occupations.

Another group that is under-represented in the workplace are workers older than 55. In 2017, only 12% of Australia's ICT workforce was 55 or older, compared to 15% of workers across all professional industries.

The Australian Government recently released a report on [Advancing Women in STEM](https://www.industry.gov.au/publications/advancing-women-stem-strategy). (STEM stands for Science, Technology, Engineering and Mathematics). It states that this gender imbalance means that Australia is at risk of losing the important contributions that Australian girls and women stand to make. The study quotes a study that found that gender-diverse companies are 15% more likely to outperform their counterparts financially.

Resources

Read Gelos Enterprises’ [Code of Conduct Policy and Procedure (pdf)](https://share.tafensw.edu.au/share/items/5f1cec7b-1d03-446a-85b7-edb42692c34e/0/?attachment.uuid=6b7e28d5-5226-450d-9ee8-b2567497512d) as an example of organisational compliance with anti-discrimination and equal opportunity laws.

### Employment laws

The [Fair Work Ombudsman](https://www.fairwork.gov.au/employment-conditions) regulates most workers' employment conditions and pay under the [Fair Work Act 2009](https://www.legislation.gov.au/Details/C2023C00459). This law establishes National Employment Standards, awards and agreements that set out minimum pay, leave, hours and other conditions that an employer must provide to new and existing workers.

Self-check

### How did you go?

You have completed the topic: **Working in ICT**. Check the boxes for the tasks you feel confident you can complete. I know how to:

work in the information and communications technology sector

complete tasks, make decisions and solve problems according to organisational policies and procedures

comply with legislation and regulatory obligations.

Assessment

As you have completed this topic, you should be ready to complete:

* Assessment event 1: Knowledge - Part 1 Working in ICT.

Before you begin you should review:

* Cluster ICT Analysis Unit Assessment Guide
* Cluster ICT Analysis Assessment Event: Knowledge 1 of 4

If your assessments are online, go to Assessments in the top menu and access the files.

Topic 2: Critical thinking in the workplace

## Overview

ICT is an exciting industry characterised by constant change. In this competitive environment, new solutions, products and processes are continually entering the market. In your ICT workplace, you may be asked to investigate and report back on a range of solutions. It is important to find reliable information and to use a framework to evaluate the information. Critical thinking and research skills are key.

In this topic you will learn to:

* identify the key concepts of critical thinking
* identify the benefits of critical thinking
* use a range of critical thinking techniques
* compare critical thinking approaches in workplace decision making processes
* apply critical thinking in the workplace.

Topic 1 explained the organisational frameworks for completing tasks and making decisions. In this topic, you will evaluate processes, products and services that may be proposed or already existing using critical thinking techniques and approaches in accordance with organisational policies and procedures.

LinkedIn videos will open in a new browser tab. Access the full video by logging in with your TAFE NSW username and password. Go to the transcript tab to access the video transcript. When you’re finished, close the tab and return to this unit. [LinkedIn Learning Support: Getting started](https://tafensw.libguides.com/linkedinlearningsupport/gettingstarted) (TAFE NSW Libraries) has more information.

## What is critical thinking?

Critical thinking is thinking clearly and rationally, making logical connections between ideas. It requires you to use reasoning and question beliefs and assumptions instead of accepting them at face value.

You will use advanced-level critical thinking skills in a professional context. This includes using methods of analysis, synthesis and evaluation.

Video

Play the Mecat video, [What is critical thinking?](https://www.youtube.com/watch?v=HnJ1bqXUnIM) (YouTube, 2:29 min) for an overview of the critical thinking mindset and techniques and or skills you can use.

To learn more about how critical thinking is important in all aspects of our lives, play the Potential video [What is critical thinking](https://www.youtube.com/watch?v=kaCIycmx8NA) and 7 reasons why critical thinking is important (YouTube, 3:19 min).

### Critical thinking concepts

Critical thinking is based on the following 2 concepts:

1. deliberate, systematic and logical thinking on a subject.
2. consideration of biases or assumptions that may impact thinking on a subject.

Apply these concepts as a critical thinker when researching, solving problems and making decisions at work. A critical thinker:

* has a goal or objective
* seeks clarity, consistency and accuracy
* tests conclusions and reasoning against specific relevant criteria
* attempts to understand the causes, effects and implications of events, systems and ideas
* strives to recognise bias, including their own and presents balanced, objective arguments
* looks for relevant, appropriate data
* is open to alternate ideas, views, perspectives and information.

Practice activity

### Activity 6: What kind of critical thinker are you?

Play the BBC Ideas video, [Five simple strategies to sharpen your critical thinking](https://www.youtube.com/watch?v=NHjgKe7JMNE) (YouTube, 4:29 min), then answer the questions below.

Read the statements, then write **true** or **false** in the space provided.

|  |  |
| --- | --- |
| Statements | True or False |
| 1. Critical thinking is being able to think clearly and rationally, making logical connections between ideas. |  |
| 1. Critical thinking requires you to be critical of another person's work. |  |
| 1. Critical thinking can be developed through actions that help you to reconsider your first judgements. |  |
| 1. An excellent critical thinker always has solutions to problems instantly. |  |
| 1. A key concept in the critical thinking process is not jumping too quickly to a solution. |  |
| 1. Asking questions is a crucial technique in the critical thinking process. |  |

### Benefits of critical thinking

Critical thinking techniques and approaches can be learned. For individuals and organisations, the benefits of adopting a critical thinking mindset include the following:

* informed decisions made using decision-making frameworks
* alignment of decisions to organisational goals and values
* systematic analysis of situations and potential solutions leading to improved efficiency and productivity
* identifying problems before they arise
* development of creative and innovative solutions
* improved problem solving
* ability to manage complex situations.

A critical thinking approach uses techniques and tools to explore problems in more detail. Some key concepts in the critical thinking process include asking questions, continuing to gather evidence to analyse the problem and not jumping too quickly to a solution. By using these approaches, you can develop effective solutions based on evidence.

If you do not use critical thinking, you risk the following:

* making poor decisions
* repeating mistakes
* making costly errors
* wasting resources
* having unhappy clients and customers
* not achieving your goals and objectives
* creating a risk-averse culture that is reluctant to change
* entrenching practices that are not questioned
* creating confirmation bias, where people tend to seek information that confirms their existing beliefs and information that does not support their views is discarded.

### Critical thinking in the workplace

You have probably used critical thinking in your life without realising it. You make many decisions based on budget, experts' opinions and trends, such as which phone or computer to purchase.

You can also apply critical thinking at work. Consider these opportunities to use critical thinking concepts:

* solving work problems
* making complex decisions
* comparing technologies and practices in the ICT sector and their potential impact on current technologies and practices
* selecting sources of reliable and verified information on technologies and practices in the IT industry
* interpreting and evaluating information from a range of sources for work requirements
* seeking and obtaining opinions, information and feedback from work colleagues on a topic
* learning about new technology, trends and practices that are likely to impact the organisation.

### Critical thinking techniques

Five primary techniques are the hallmarks of a successful critical thinking process. They are:

* analysis
* evaluation
* interpretation
* problem solving
* questioning.

These considerations are equally important; your critical thinking is only as successful as your weakest link. For example, you can analyse, evaluate, interpret and problem-solve to a high standard. However, if you don't ask the right questions, you may have inadequate information.

#### Analysis

Analysis in critical thinking is the ability to find and scrutinise research, evidence, information, data and views and see relationships between parts of a problem. Analysis includes:

* examining and breaking information into parts by identifying motives or causes
* making inferences and finding evidence to support generalisations
* objectively approaching information without personal bias or emotions
* using curiosity to wonder why something is the way it is.

In the analysis stage of critical thinking on a problem or decision, you will examine methods and processes, reasons and causes, and alternative options to your problems, issues or questions. The aim is to break down the whole topic into parts to analyse the relationship between each part, the part to the whole and the whole to the parts.

For example, if you are thinking through a problem, you might want to determine the factors involved. Then consider what happens when one aspect is removed or altered and how one factor might impact another. This will help you develop more analytical answers and deepen your thinking.

#### Evaluation

Evaluation in critical thinking is where you judge the value of your research based on criteria, compare ideas and information and identify strengths and weaknesses. You will examine the significance of something, which will lead you to reasonable conclusions, solutions, or recommendations. To effectively evaluate, one must be impartial. Impartiality is exhibited when evaluating critical thinking ideas and involves including both positive and negative aspects and considering which points work well with each other and those that do not.

#### Interpreting

Interpreting is understanding facts and ideas by organising, comparing, translating, describing and stating main ideas.

You will read and then interpret, evaluate and extract the most relevant information from a range of texts for work requirements.

You will also interpret and critically analyse numerical data to determine work process requirements.

#### Problem solving

Problem solving is the ability to identify the critical questions in a problem, develop possible plans for solving, follow through on those plans and evaluate both the project's success and the solution.

Problem solving involves applying logic and reasoning.

Video

The [Problem Solving Techniques](https://www.linkedin.com/learning/problem-solving-techniques?u=57684225&auth=true) course will help you use your logic and intuition to find solutions to your problems. You can watch the whole course or just the parts you need. (LinkedIn Learning, 1:32 hrs)

#### Questioning

Questioning is a technique to:

* identify and check information
* understand gaps in knowledge
* search for additional information
* satisfy your curiosity about a topic
* involve others in problem-solving and decision-making.

Questions may be open or closed, simple or probing. Here are some questions to ask during the critical thinking process:

* Is the information accurate?
* How can the information or data be verified or tested?
* Does all this make sense together?
* Does what I say follow from the evidence?
* Which of these facts are most important?
* Is this the most crucial problem to consider?
* Am I considering all the relevant viewpoints?
* How does the information relate to the problem?
* How does the information help with the problem?

Restating problems as open-ended questions makes solutions to the problems easier to develop. Asking this type of question brings multiple possibilities since it generates information.

For example:

**Problem:** My car has broken down.

**Question:** I wonder why my car has broken down?

**Possibilities:**

* Is the battery flat?
* Is the car overheating?
* Are there electrical issues?
* Did I use the correct petrol when I last filled up?
* Have I run out of petrol?

Practice activity

### Activity 7: Ask problems as questions

Restate the following problems as questions.

1. Problem: The computer won't start.
2. Problem: The client has not replied to my message.

Video

The LinkedIn Learning video [Using Questions to Foster Critical Thinking and Curiosity](https://www.linkedin.com/learning/using-questions-to-foster-critical-thinking-and-curiosity?u=57684225&auth=true) (LinkedIn Learning, 3:55 min) explains the different types of questions, the benefits of asking questions and how to ask questions effectively.

## Critical thinking approaches

In this section, you can compare and contrast alternative critical thinking approaches. Think about which approach you could use in your workplace decision-making process.

### RED model of critical thinking

The RED Model is a simple and practical framework for critical thinking developed by Pearson, a global learning company. RED stands for:

* Recognise Assumptions
* Evaluate Arguments
* Draw Conclusions

#### Recognise assumptions

In this state, you will notice and question assumptions to help to reveal information gaps or unfounded logic. Assumptions also need to be examined from different viewpoints. Questions you can ask yourself to recognise assumptions include:

* What is the key issue/problem that you are trying to solve?
* What information and facts do you have about this issue?
* What are your ideas and assumptions that support your strategy or plan?
* Is there solid evidence to support those assumptions and what might be some gaps in your reasoning?
* Who are the key stakeholders and what are their viewpoints?
* What other ideas should be explored?
* What else do you need to know?

#### Evaluate arguments

Evaluation entails analysing information objectively and accurately, questioning the quality of supporting evidence and understanding how emotion influences the situation. Common barriers include confirmation bias or allowing emotions to get in the way of objective evaluation. Questions you can ask yourself to evaluate information and arguments include:

* What are the pros and cons of the solution you are proposing?
* What are your biases?
* Is there someone with a different opinion you could run your ideas by?
* How will your decision affect others and how will you handle this?
* What will be the financial impact of your decision?
* Who would disagree with your proposed solution and what rationale supports their viewpoint?
* What key points or perspectives must you consider as you evaluate the options?

#### Draw conclusions

Drawing conclusions requires you to bring diverse information together to develop a conclusion that logically follows from the available evidence. Questions you can ask yourself to evaluate problems or arguments include:

* After evaluating all the facts, what is the best possible conclusion?
* What specific evidence is driving your conclusion?
* Is there new evidence that would impact your decision?
* What do your common sense and experience tell you to do?
* What is the timeline for making a decision (for example, would your decision differ in a month)?
* What opportunities does your conclusion provide?
* What risks are associated with your conclusion?

Practice activity

### Activity 8: Steps to evaluate arguments

Play the video [Critical Thinking Cafe](https://youtu.be/XAp1Foj7BzY?feature=shared) (YouTube, 3:12min) on evaluating arguments and then read the question and select the correct answers.

1. Select **3** steps to evaluate arguments.

|  |  |  |
| --- | --- | --- |
| # | Choices | Answer/s |
|  | Identify the assumptions that underpin an argument or opinion |  |
|  | If an argument and conclusion is published, it is correct |  |
|  | Determine whether an argument is logically valid |  |
|  | If something happened in the past, it must be the cause of a current problem |  |
|  | Check to see if there is any missing information that would change a conclusion |  |

Practice activity

### Activity 9: RED approach in practice

Download [Cl\_ICTAnalysis\_TL\_SW\_Appx\_Activities (docx)](https://share.tafensw.edu.au/share/items/d8512e5c-5e6a-42e7-869c-15795e1fbb0f/0/?attachment.uuid=adbfe0f2-160b-4b2b-b8bd-95fffb58a49c) and practice using the RED critical thinking approach in Activity 9.

### DAE model

DAE is a 3-stage model that can be applied to problems in the ICT function.

#### Stage 1: Description

In this stage, you are exploring the problem so you know what to work on and why. You may ask questions like:

* What is this problem about?
* Who does it involve or affect?
* When and where is this happening?

Compare the two examples and determine which is more helpful to solve a work problem.

Table 3 Identifying the problem clearly

|  |  |
| --- | --- |
| Problem description types | Example |
| Simple technique | Too many equipment breakdowns. |
| Critical thinking technique | In the past 3 quarters, 60% of office equipment has had faults reported. In previous quarters, the reported faults were 40%. |

After identifying the problem clearly, you can establish the desired research outcome.

For example: To reduce the fault rate of equipment over 2 years old to 40%.

#### Stage 2: Analysis

In this stage, you identify and investigate processes, reasons, causes and symptoms of problems without jumping to conclusions.

Gather facts and seek the ideas and opinions of others. You may ask questions like:

* What is this problem about?
* Who does it involve or affect?
* When and where is this happening?

#### Stage 3: Evaluation

In this stage, you will consider your research and evidence and judge the information's relevance, value and significance.

You will evaluate the options against weighted decision-making criteria. Your criteria may relate to budget, time, management preferences, interoperability with existing systems and technology, user-friendliness and licencing, among other items.

You may present your evaluation in a report as a conclusion and recommendation.

* **Report conclusion:** Evaluation of research findings, selection of steps and ICT technology to implement and explanation of how it will resolve the ICT problem.
* **Report recommendation:** Specific planning actions to implement the decision.

Practice activity

### Activity 10: Developing decision-making criteria

Imagine that you will soon be purchasing a new car. It is essential that you ask yourself some questions to determine the criteria against which you will compare cars.

1. What is the budget for my new car?
2. What journeys will I mainly use my car for?
3. What car features are essential for me?
4. How much space do I need?
5. Do I prefer a new or a used car?

Practice activity

### Activity 11: Decision-making criteria in practice

Download [Cl\_ICTAnalysis\_TL\_SW\_Appx\_Activities (docx)](https://share.tafensw.edu.au/share/items/d8512e5c-5e6a-42e7-869c-15795e1fbb0f/0/?attachment.uuid=adbfe0f2-160b-4b2b-b8bd-95fffb58a49c) and practice developing decision making criteria in Activity 11.

## Pros and cons of options

A simple method to compare the advantages and disadvantages of the options you have short-listed to resolve your problem is to use a list of **pros and cons**.

If the comparison is more complex, you would evaluate the options against weighted **decision-making criteria**. Your criteria may relate to budget, time, management preferences, interoperability with existing systems and technology, user-friendliness and licencing, among other items.

### Scenario

A campus is considering using new technologies in the classroom.

Table 4 Pros and cons

|  |  |
| --- | --- |
| ICT in education pros | ICT in education cons |
| New way of learning  Supports students with special needs  Promotes higher order thinking such as evaluating and planning  Develops ICT literacy and capability  Motivates learners and makes learning fun and enjoyable | Can be a distraction in class  Can foster cheating  Not all students have equal access to ICT tools and technology  Does not always operate well  May access inappropriate content during class  May reduce social activities |

Practice activity

### Activity 12: Pros and cons in practice

Download [Cl\_ICTAnalysis\_TL\_SW\_Appx\_Activities (docx)](https://share.tafensw.edu.au/share/items/d8512e5c-5e6a-42e7-869c-15795e1fbb0f/0/?attachment.uuid=adbfe0f2-160b-4b2b-b8bd-95fffb58a49c) and practice using the pros and cons critical thinking method in Activity 12.

### Brainstorming

Brainstorming is a method for developing as many ideas about a topic or problem as possible in a group. All suggestions are written down and the group does not judge the ideas generated. All thoughts and contributions are recorded.

Brainstorming helps to generate ideas quickly and enhances creativity within the team. When brainstorming, use whiteboards or flip charts to write down all ideas. This instant visual representation of ideas can trigger other team members to build on their ideas.

After all the ideas have been recorded, they can be analysed and developed into actions.

Brainstorming is a powerful critical thinking technique that encourages free thinking and creative problem-solving.

This example shows the variety of ideas generated by the team for the question: How can we enhance office productivity through technology. This visual representation provides a hierarchical view of the brainstorming ideas, starting with the main theme and branching out into specific technology-based solutions.

You can find a visual representation of brainstorming at [Mindtools](https://www.mindtools.com/ab1w9zu/starbursting).

Collaboration

### Activity 13: Brainstorming in practice

1. Set up a group discussion and choose one person as a note-taker.
2. In a group discussion, quickly brainstorm this question: How do I get the team to return to working from the office instead of remotely?

### 5 whys technique

The 5-whys technique helps you determine the root cause of a problem.

Asking 'why?' five times allows you to peel back the layers of a problem to find out the source of the problem. It is a useful technique to use in group problem-solving.

Let's look at an example.

The problem: Employee turnover in the ICT section is 20% higher than in other departments, with a survey suggesting poor induction as a likely cause. Discuss the following in your group.

* Why aren't new employees learning new skills and quickly fitting into the ICT Team?
* Why doesn't induction provide the right learning information and motivation?
* Why is induction ad-hoc with nothing written down?
* Why didn't the manager approach induction more systematically?
* Why doesn't the manager know enough about indication programs?

Video

Learn [How to use the five whys](https://www.linkedin.com/learning/leading-projects/how-to-use-the-five-whys-2?u=57684225) (LinkedIn Learning, 3:12 min) in practice in a workplace in this video from LinkedIn Learning.

Practice activity

### Activity 14: 5-whys in practice

Download [Cl\_ICTAnalysis\_TL\_SW\_Appx\_Activities (docx)](https://share.tafensw.edu.au/share/items/d8512e5c-5e6a-42e7-869c-15795e1fbb0f/0/?attachment.uuid=adbfe0f2-160b-4b2b-b8bd-95fffb58a49c) and practice using the 5-whys critical thinking method in Activity 14.

### Cause and effect diagram

A cause and effect diagram can be used to clarify the links between different factors that affect performance. The diagram is also another way to visualise your 5-whys analysis.

A cause and effect diagram can also be known as an Ishikawa or fishbone diagram. It can be a tool and a technique. It is a way to break a problem down and determine the actual cause. Cause and effect diagrams are beneficial with complicated problems where a maze of facts must be sorted out to isolate the most likely cause/s of a problem.

To make a cause and effect diagram, put the problem in the head of the fish and then decide on the possible categories of causes of the problem and show them as major bones off the central spine of the fish.

The following is an example of a cause and effect diagram.

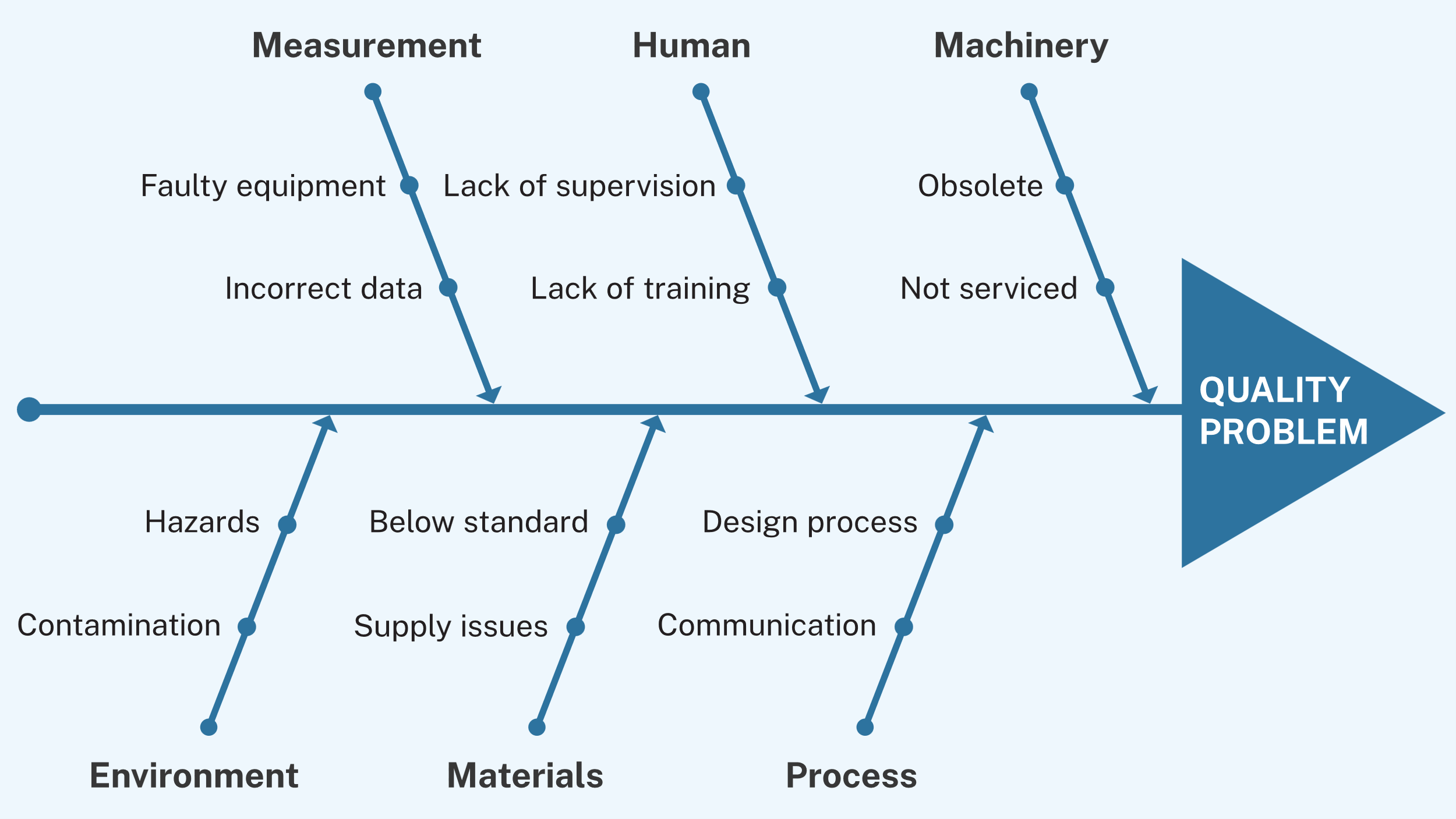


Figure 1 – Cause and effect diagram © TAFE NSW 2023

[Long description for cause and effect diagram](https://share.tafensw.edu.au/share/items/d8512e5c-5e6a-42e7-869c-15795e1fbb0f/0/?attachment.uuid=e9d4eab0-7c5c-4092-ba39-2c0f84fcbc6f) © TAFE NSW 2023

Practice activity

### Activity 15: Cause and effect diagram in practice

Download [Cl\_ICTAnalysis\_TL\_SW\_Appx\_Activities (docx)](https://share.tafensw.edu.au/share/items/d8512e5c-5e6a-42e7-869c-15795e1fbb0f/0/?attachment.uuid=adbfe0f2-160b-4b2b-b8bd-95fffb58a49c) and practice completing a cause and effect diagram in Activity 15.

### SWOT analysis

A SWOT analysis is one of the most effective ways of reviewing the strengths and weaknesses of the organisation's existing arrangements for planning change, innovation and improvement. SWOT stands for:

* **Strengths**: These are a list of areas related to the problem or decision that the organisation is excellent at. What is the organisation doing better than its competition? For example, they might have a higher market share, fewer product returns or a more efficient sales force.
* **Weaknesses**: These are a list of areas related to the problem or decision that the organisation is relatively weak at. What is the organisation doing worse than its competition? For example, they might have higher waste during production, higher employee turnover or an inexperienced leadership group.
* **Opportunities**: These are a list of opportunities the organisation has the resources, to pursue with a chance of success. What can the organisation capitalise on from its external environment? For example, favourable overseas exchange rates, technological development and a new market opportunity.
* **Threats**: These are a list of areas related to the problem or decision the organisation should worry most about. What external factor could be a potential problem for the organisation? For example, an increase in interest rates, a new competitor in their market or a lack of access to raw materials (from drought or flood).

SWOT is a commonly used planning tool and a way to consider a situation's pros and cons from internal (strengths and weaknesses) and external (opportunities and threats) viewpoints.

SWOT is useful for continuous improvement as it gives a clear picture of where the organisation is, highlighting the path to where it wants to go.

You get the information for the SWOT from:

* financial reports
* operational efficiency reports
* process flows
* consulting reports
* economic reports
* industry reports
* government websites
* the organisation's vision, strategies and plans
* experience/subject matter experts
* research
* supply chain analysis.

The SWOT can be formulated as tables:

#### External environment

The external environment encompasses the major forces existing outside the organisation which have the potential to significantly influence or impact the organisation’s operations.

Organisations monitor the external environment to identify events or trends that impact the achievement of organisational objectives and to identify and analyse changing trends and opportunities relevant to the organisation.

The information for the external environment analysis may be sourced from internal sources and industry reports and the organisation may seek advice from specialists, where appropriate, to identify technology and electronic commerce opportunities, for example.

On a macro level, the external forces are:

* **International:** developments in overseas countries
* **Sociocultural:** values, norms and attitudes of society
* **Technological:** developments in product and service production, e.g., digitisation of services and products
* **Economic:** determinants of an economy's performance, such as rates of unemployment, interest rates, inflation and exchange rates
* **Political:** the governmental systems within which the organisation operates, for example, political stability or instability, corruption, tax policy, education systems, interest rates and so on.

At a more specific task level there are parts of the external environment that more directly influence how an organisation conducts its business, including:

* **Legal:** specific laws and regulations, such as, employment, discrimination, customer protection, copyright, corporations, work health and safety, tax and environmental laws.
* **Competitors:** other organisations who compete in the same market as well as potential competitors who may disrupt the market and market share.
* **Suppliers:** the individuals and organisations that supply the materials, services and goods that the organisation needs to operate.

Resources

Business Queensland explains how you can use [SWOT analysis](https://www.business.qld.gov.au/running-business/planning/swot-analysis) as a decision-making tool.

Practice activity

### Activity 16: SWOT analysis in practice

Practice completing a SWOT analysis in the activities document: [Cl\_ICTAnalysis\_TL\_SW\_Appx\_Activities (docx)](https://share.tafensw.edu.au/share/items/d8512e5c-5e6a-42e7-869c-15795e1fbb0f/0/?attachment.uuid=adbfe0f2-160b-4b2b-b8bd-95fffb58a49c).

### Mind mapping

Mind maps provide a structured way to capture and organise ideas and information. They help users to understand concepts by breaking them down into their parts. The technique is used to develop new ideas, or to break down and better understand existing information.

Mind maps can be drawn by hand. There are also easy-to-use, free software programs that can help you create a mind map.

Video

The video from Ayoa describes in pictures [How to mind map with Tony Buzan](https://www.youtube.com/watch?v=u5Y4pIsXTV0) (YouTube, 4:59 min).

Practice activity

### Activity 17: Mind mapping in practice

Practice mind mapping in the activities document: [Cl\_ICTAnalysis\_TL\_SW\_Appx\_Activities (docx)](https://share.tafensw.edu.au/share/items/d8512e5c-5e6a-42e7-869c-15795e1fbb0f/0/?attachment.uuid=adbfe0f2-160b-4b2b-b8bd-95fffb58a49c).

### Six Thinking Hats

Another creative and collaborative model for critical thinking you may want to learn about is the **Six Thinking Hats**. This model helps you and your team alternate between different perspectives and thinking styles to generate new ideas, evaluate problems, solve problems and facilitate group discussion.

You can mentally wear different hats when analysing and evaluating a problem.

Edward de Bono developed this approach. The [de Bono Group website: Six thinking hats](https://www.debonogroup.com/services/core-programs/six-thinking-hats/) explains how the each of the hats works.

Video

LinkedIn instructor Melanie discusses [Making decisions: Six Thinking Hats](https://www.linkedin.com/learning/hybrid-team-building-with-purpose/making-decisions-six-thinking-hats?u=57684225) in a hybrid team discussion (LinkedIn Learning, 3:08 min).

Practice activity

### Activity 18: Six thinking hats in practice

Download [Cl\_ICTAnalysis\_TL\_SW\_Appx\_Activities (docx)](https://share.tafensw.edu.au/share/items/d8512e5c-5e6a-42e7-869c-15795e1fbb0f/0/?attachment.uuid=adbfe0f2-160b-4b2b-b8bd-95fffb58a49c) and practice using the 6 thinking hats approach in Activity 18.

## Developing a report proposal

Proposals are a way to suggest ideas and allow you to make a structured, logical argument based on your research and critical thinking. Its purpose may be to present a decision or to gain approval for an idea you want to implement within your organisation. A proposal outlines a solution to a problem.

An effective proposal requires good planning. You need to think about your audience, the content and the formatting. It involves the use of critical thinking skills to:

* document your key research findings, ideas, conclusion and recommendations in a format and tone appropriate to the audience and context
* articulate your ideas and requirements clearly and persuasively using techniques appropriate to a diverse audience and environment
* prepare persuasive responses with an understanding and depth of research and critical thinking on the topic and concepts
* use features and functions of digital tools and technologies to present information.

Your organisation may have a preferred report template, or you can develop your report according to the project brief.

In Topic 3, you will learn how to apply the critical thinking concepts, techniques and approaches to researching, documenting and making recommendations on emerging technology and practices.

Video

The instructor in this LinkedIn video, [Making reports reader friendly](https://www.linkedin.com/learning/writing-a-business-report/making-reports-reader-friendly?resume=false&u=57684225) (LinkedIn Learning, 4:19 min), guides you in writing a well-constructed business report.

Self-check

### How did you go?

You have completed the topic: **Critical thinking in the workplace**. Check the boxes for the tasks you feel confident you can complete. I know how to:

identify the key concepts of critical thinking

identify the benefits of critical thinking

use a range of critical thinking techniques

compare critical thinking approaches in workplace decision making processes

apply critical thinking in the workplace.

Assessment

As you have completed this topic, you should be ready to complete:

* Assessment event 1: Knowledge - Part 2 Critical thinking in the workplace

Before you begin you should review:

* Unit Assessment Guide
* Assessment Event: Knowledge 1 of 4

If your assessments are online, go to Assessments in the top menu and access the files.

Topic 3: Emerging technologies and practices

## Overview

This topic describes the skills and knowledge required to identify emerging technologies and practices in the ICT sector and evaluate their potential impact on organisational practices. It applies to individuals who work across a wide range of information technology (IT) areas, including technical support, network administration, web technologies, software applications and digital media technologies.

In this topic you will learn to:

* research and evaluate the purpose, features, attributes and potential applications of emerging ICT technologies and practices
* develop strategies and plans to respond to emerging technologies and practices
* use systematic research methods.

In Topic 2, you learned about critical thinking. In this topic you will use a range of critical thinking approaches and techniques to identify and address the limitations of current workplace processes and recognise the opportunity to apply new ideas for implementation.

## Emerging technologies and practices

Emerging technologies and practices refer to ICT technologies and practices that:

* are currently being developed
* are expected to be available in the next 5 to 10 years
* are relatively new or novel, but not yet widely adopted
* may create significant effects
* already exist but are in continuing development.

Examples of emerging technologies include:

* artificial intelligence
* augmented reality
* virtual reality
* drones
* blockchain
* internet of things and digital twins
* 3D printing
* robotics
* cloud computing.

Examples of emerging practices that will impact ICT functions include:

* hybrid and remote work
* environmental sustainability
* mental health and employee well being
* consulting and temporary work
* innovative training and development
* collaborative communication and project approaches
* digitisation of routine tasks.

Organisations must evaluate each emerging technology and practice to determine:

* which trends or ideas to learn more about
* which technologies or practice aligns with the strategic direction of the organisation
* what the future of the industry will look like
* how the emerging technology or practice will impact customers, operations, market share, compliance and employees
* what the features and functions of the emerging technologies and practices are
* what the disadvantages and advantages relevant to the organisation’s context are.

Management do not always know the answers to these questions and will ask experts to conduct research and provide recommendations on which technology and practice to implement.

## Research approach

Imagine if your manager asked you this question: **Could we use AI chatbots to respond to common ICT help desk questions?**

What is your research approach?

How will you collect, organise, analyse and present information to prepare and present a report to the manager?

A research approach is a plan and procedure that outlines how you will collect, analyse and interpret data. This is based on the type of research problem being addressed and the audience for the research.

### Objectives and purpose

Begin your research with a clearly stated objective or purpose. Identify your research objectives according to organisational requirements.

Topic 1 discussed exploring the issue or problem so you know what to work on and why, and asking questions like:

* What is this issue or problem about?
* Who does it involve or affect?
* When and where is this happening?

This is an example of the research process.

Table 5 Research objectives and outcomes

|  |  |
| --- | --- |
| Research process | Example |
| Identify the broad research topic area | Emerging ICT technologies and practices |
| Select the research focus | AI chatbots in the ICT help desk function |
| Identify the problem | Slow response times for common ICT help desk enquiries |
| Identify the research objectives | To evaluate the purpose, features and potential applications AI chatbots  To identify the opportunities and threats from the technology  To make recommendations on whether and how to use AI chatbots in the ICT help desk function |
| Identify research outcomes | Presentation of a report to management |

Practice activity

### Activity 19: Research objectives

Read the question and select the correct answer.

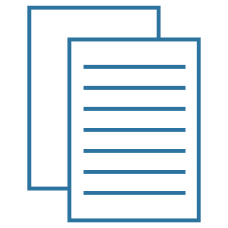
1. Which statement represents a clear research objective?

|  |  |  |
| --- | --- | --- |
| # | Choices | Answer/s |
|  | Improve cyber security training |  |
|  | Identify and evaluate 3 options for cyber security training at XYZ company |  |
|  | Learn about cyber security training |  |

### Research scope

The type of information you collect and how you evaluate that information will depend on your research scope and decision-making criteria which are determined by the organisation.

In Topic 1 you learned that your criteria may relate to budget, time, management preferences, interoperability with existing systems and technology, user-friendliness, and licencing, among other items.

 Resources

Read the webpage [What is digital transformation?](https://enterprisersproject.com/what-is-digital-transformation) to learn more about what digital transformation means for an organisation.

## Evaluate current situation

Before you can look to the future, you will examine the present situation. Areas to understand and evaluate include:

* the current technologies, hardware and software products in use
* key elements of existing workplace processes, policies and procedures
* current products and services.

You will apply your critical thinking to decide the organisation’s strengths and limitations in these three areas.

For example,

* the organisation may use the latest project management tools. However, most team members don’t use all the functions because of lack of training and lack of time to complete the training
* the organisation may have an excellent process for managing ICT service desk problems but be using spreadsheets to record and track issues
* the organisation cannot modify some software programs as they are specifically designed to meet industry and regulatory compliance requirements
* the existing technologies may have applications beyond what they are currently been used for.

Understanding the organisational context and their requirements will allow you to determine the advantages and disadvantages for the organisation.

Information about current technologies, hardware, software, policies and procedures, products and services is available from internal sources such as:

* intranet
* departmental specialists
* data bases
* workplace documents and previous reports
* observation.

### Case study

The ICT Support Senior Manager at Gelos Enterprises has asked you to investigate options to improve the quality outcomes related to ICT procurement. You investigate and evaluate the current situation.

1. First, identify current processes, systems and technology related to ICT procurement and set the information out in a table.

Table 6 Current processes, systems and technology

|  |  |
| --- | --- |
| Workplace policy, procedure or template | System and technology used |
| ICT Procurement and installation policy | Standard Operating Environment software  Manual tracking of requests, quotes, approvals and installation |
| ICT Disposal and Storage Procedure | Written instructions located on intranet |
| ICT Governance Policy | Quality system |
| Hardware/Software Upgrade Request form | Fillable form to be emailed to approver |
| Quotation Request form | Fillable form to be emailed to approver |

1. Next, analyse the quality problems to determine causes and effects.

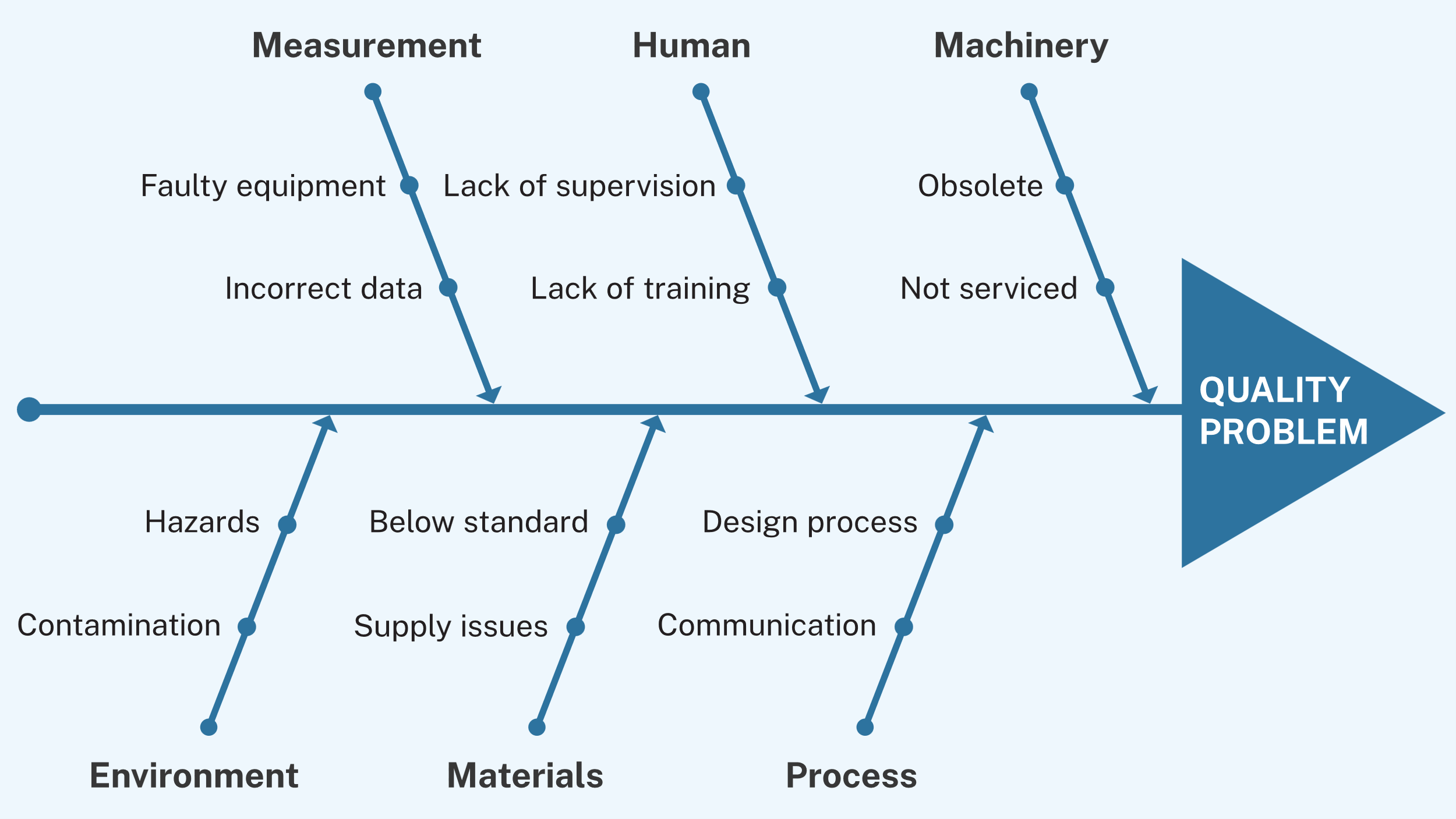


Figure 2 Cause and effect diagram © TAFE NSW 2023

[Long description for cause and effect diagram](https://share.tafensw.edu.au/share/items/d8512e5c-5e6a-42e7-869c-15795e1fbb0f/0/?attachment.uuid=e9d4eab0-7c5c-4092-ba39-2c0f84fcbc6f) © TAFE NSW 2023

1. Finally, knowing the strengths and limitations of the current situation, begin to research options for change by applying critical thinking techniques and approaches.

## Impact of emerging technologies

There can be specific reasons for slow adoption of new and or emerging technologies. These reasons can vary widely based on the industry, organisational culture and the nature of the technology in question.

Some common factors can include:

* cost
* legacy systems and infrastructure
* resistance to change
* lack of skilled personnel
* return on investment uncertainty
* compliance
* time-consuming implementation
* no strategic direction plan
* data security risks.

### Cost

Implementing new technology often involves significant upfront costs, including the purchase of hardware, software and the training of personnel. Organisations may be hesitant if they are unable or unwilling to allocate the necessary funds.

### Legacy systems and infrastructure

Many organisations have existing systems and infrastructure that may not be easily compatible with new technologies. Integrating new technology with legacy systems can be complex and time consuming.

### Resistance to change

Employees and management may be resistant to change, especially if they are accustomed to existing processes and technologies. Fear of the unknown, job insecurity, or a lack of understanding about the benefits of the new technology can contribute to this resistance.

### Lack of skilled personnel

Adopting new technology often requires a workforce with the necessary skills to implement, manage and maintain the technology. If an organisation lacks employees with the required expertise, it may face challenges in adopting new technologies.

### Uncertainty about return on investment (ROI)

Organisations may be cautious about adopting new technology if they are unsure about the potential return on investment (ROI). If the benefits are not clearly understood or if the technology's impact on the bottom line is uncertain, decision makers may be hesitant to invest.

### Compliance issues

Some industries are subject to strict regulations, and adopting new technologies may raise concerns about compliance. Organisations may need to navigate complex regulatory landscapes before implementing certain technologies.

### Time-consuming implementation

The time required to implement new technology can be a barrier. If the adoption process is lengthy and disruptive, organisations may be hesitant to undertake the transition, especially if it interferes with day-to-day operations.

### No strategic direction plan

Organisations may be slow to adopt new technology if they lack a clear strategic plan for technology adoption. Without a roadmap or vision for how the technology fits into the overall business strategy, decision makers may hesitate to move forward.

### Data security risks

Organisations may be cautious about the security implications of new technology. If there are perceived risks to data security, privacy, or the overall stability of the organisation's IT infrastructure, decision makers may delay adoption until these concerns are adequately addressed.

### Market uncertainty

In rapidly evolving industries, organisations may be hesitant to adopt new technology due to uncertainty about which solutions will emerge as industry standards. Waiting for a more stable market can be a strategic decision for some organisations.

## Research emerging technologies and practices

In this section you will learn to use systematic processes to gather and analyse information required to make decisions.

### Sources of information

The type of information you gather depends on your objectives and outcomes.

Various methods of collecting information in the workplace can help you make good decisions. Some of the information is widely available, while other information can only be obtained at considerable effort and cost.

When searching for information on current topics it can be useful to locate news media articles and reputable websites. These sources are generally among the first places that current topics are discussed, can provide background information on a topic and may lead you to other sources of information such as government departments, regulators and industry associations.

Once you have a clear understanding of the purpose and scope of the information you need for your research, the next step is to decide where you are going to get the information from. You will use various information sources to provide answers to your questions.

There are few different types of information sources:

Table 7 Different types of information sources

|  |  |
| --- | --- |
| Information sources | Description |
| Primary | Primary sources of information are original research. It can be obtained through observation, interviews, questionnaires and experimental research such as diagnostic testing. |
| Secondary | Secondary information comprises information that has already been gathered for another purpose and provides reflection, review and interpretation for you to analysis its applicability to your research. |
| Qualitative research | Qualitative research obtains data in the form of text and descriptions. Qualitative data can be collected through interviews, observations, questionnaires or focus groups. The aim of this is about understanding the how and why a behaviour or occurrence works as it does. It helps to gain an insight into the problem and uncover trends in thinking. |
| Quantitative research | Quantitative research obtains data in a numerical form, which can then be measured in units. This data can be represented in graphs and tables. This approach is seen as rational and objective because it is based on statistics. |

Resources

* This [Research Guide](https://libguides.newcastle.edu.au/researchmethods) from the University of Newcastle explains different research methods and data collection tools
* TAFE NSW Researching Resources from TAFE NSW Libraries provides excellent resources for [researching and referencing skills](https://tafensw.libguides.com/research/referencing).

#### Internal sources

Internal information is available within the organisation. Internal sources include the following:

* employees in the organisation
* surveys or reports already published by the organisation
* intranet
* data or information files.

#### External sources

There are many excellent external sources of accurate and professionally compiled information about emerging technologies and practices.

#### Academic research

Academic research is systematic, scholarly studies of research problems of situations by universities and other professional organisations.

Resources

Review these sources of academic research on emerging technologies and practices.

* [Global CEO Survey](https://www.pwc.com/gx/en/ceo-agenda/ceosurvey.html) (PWC)
* [Educause Horizon Report](https://library.educause.edu/search#?q=horizon)

#### Consultancies

Organisations that consult with companies in implementing new technologies and practices regularly provide blog articles, webinars, industry events, workshops and updates on the industry.

Resources

Review these consultancy websites:

* [IDEO](https://www.ideo.com/)
* [Singularity Group](https://su.org/)
* [TECHNO | PHIL | oSOPH](https://technophilosoph.com/en/).

The video [Essential 8 Technologies Introduction](https://www.youtube.com/watch?v=wd1HbKx73_U) (YouTube, 5:03 min) explores the technologies that PWC believes are changing the world.

#### Government departments and regulators

Australian government and regulator websites provide credible, reliable and current information.

Governmental departments related to technology include:

* [Department of Industry, Innovation and Science](https://www.industry.gov.au/data-and-publications/australias-tech-future)
* [Digital Transformation Agency](https://www.dta.gov.au/)
* [Australian Bureau of Statistics](https://www.abs.gov.au/Technology-and-Innovation)
* [Commonwealth Scientific and Industrial Research Organisation (CSIRO)](https://www.csiro.au/en/)
* [Australian Trade and Investments Commission](https://www.globalaustralia.gov.au/industries-technologies).
* **Business magazines** often publish articles related to general industry ICT trends. Review these business magazine websites:

#### Business magazines

Business magazines often publish articles related to general industry ICT trends. Review these business magazine websites:

* [Business Insider Australia](https://www.businessinsider.com/)
* [Harvard Business Review](https://hbr.org/)
* [The Enterprisers Project](https://enterprisersproject.com/).

#### Technology websites

For the latest, more technical information on ICT technologies and practices, read articles of interest on technology websites, including the following:

* [Gizmodo](https://www.gizmodo.com.au/)
* [Engadget](https://www.engadget.com/)
* [Technorati](https://technorati.com/)
* [The Verge](https://www.theverge.com/)
* [TechRepublic](https://www.techrepublic.com/)
* [Slash Gear](https://www.slashgear.com/)
* [Digital Trends](https://www.digitaltrends.com/)
* [The Next Web](https://thenextweb.com/au/)
* [TechCrunch](https://techcrunch.com/tag/australia/)
* [Wired](https://www.wired.com/tag/australia/)
* [TechRadar](https://www.techradar.com/au).

You can also go directly to the vendor’s websites where you may learn about future upgrades and new products.

### Evaluating technology and practices

When evaluating emerging technologies and practices, you’ll need to decide on the evaluation criteria. This will allow you to make an informed judgement. What is your overall view of how good or bad the technology or practice is? While the evaluation is generally based on your opinion, it shouldn’t come across as opinionated.

Video

Play the Charles Sturt University video, [Evaluating information](https://www.youtube.com/watch?v=hxzdlLcZAB4&t=103s) (YouTube, 3:17 min) to learn how the CRAP (Currency, Reliability, Authority, Purpose) test can help you quickly and easily evaluate the quality of any piece of information.

## Criteria for emerging technologies and practices

To compare emerging technologies and practices you will identify and document their criteria, including the following:

Table 8 Attributes of emerging technologies and practices

|  |  |
| --- | --- |
| Attributes | Description |
| Purpose | The purpose of a technology is the central reason for which it is created and used. The distinction between technologies can be defined by their unique functions, features and attributes. |
| Functions | Functions refer to the specific tasks, operations, or actions that a technology is designed to perform. These are the practical, operational aspects that contribute to fulfilling the overall purpose of the technology. |
| Attributes | Attributes are inherent characteristics or qualities that define a technology. These can include measurable aspects like size, speed and capacity, as well as more abstract qualities such as reliability, flexibility, or energy efficiency. |
| Features | Features represent distinctive elements or capabilities that a technology possesses, contributing to its functionality or performance. Features often highlight the unique aspects that sets a particular technology apart from others in terms of usability or effectiveness. |
| Potential applications | The ways in which a technology or practice could be applied to problems or challenges. For example, the potential of using ChatGPT or similar applications to help employees write better letters to customers. |

Collaboration

### Activity 20: Potential application of technology

Use the critical thinking technique you learned in Topic 2 to brainstorm the potential application of Microsoft’s new [Azure OpenAI Service](https://azure.microsoft.com/en-ca/products/ai-services/openai-service) for ICT practices.

In summary, the **purpose** is the overarching goal of a technology; **functions** are the specific tasks it performs; **attributes** are inherent qualities; and **features** are distinctive capabilities that contribute to the overall functionality of a technology.

The information will be located in

* technical documentation
* complex terminology and diagrams
* numerical data.

Practice activity

### Activity 21: Evaluate collaborative tools in practice

Download [Cl\_ICTAnalysis\_TL\_SW\_Appx\_Activities (docx)](https://share.tafensw.edu.au/share/items/d8512e5c-5e6a-42e7-869c-15795e1fbb0f/0/?attachment.uuid=adbfe0f2-160b-4b2b-b8bd-95fffb58a49c) and practice evaluating collaborative tools yourself or in a group in Activity 21.

### Assessing emerging technologies and practices

Now you are knowledgeable about the emerging technology or practice you have researched; you can analyse and evaluate them. You may organise your research findings under the following categories:

* **Advantages and disadvantages:** refer to the Pros and Cons section of Lesson 2.
* **Opportunities and threats:** refer to the SWOT section of Lesson 2.
* **Likely impact on current organisational technologies and practices** : refer to Evaluate current situation section of Lesson 3.
* **Alignment to the objectives of the organisation**: refer to Organisational objectives section in Lesson 1.

Part of evaluation is to assess the potential impacts of the technology or practice on the organisation. This will first involve identifying the potential opportunities and threats. This may involve more research, for example, investigating an organisation that has already implemented the same technology or practice. If this isn’t possible, you will need to conduct an activity such as brainstorming to identify the impacts, opportunities and threats.

Read the article [Futures Wheel Analysis and Method explained: Theory and Example](https://www.toolshero.com/decision-making/futures-wheel-jerome-glenn/) by Jerome Glenn to understand a form of structured brainstorming that can be used for this.

At this point of your research and evaluation, you would obtain feedback from an appropriate person within the organisation on your work so far. This will help you to review your impact assessment and incorporate their feedback into your report.

## Decision making

Your information gathering should have provided sufficient data on which to base a decision so that you know the advantages and disadvantages of each option. It is now time to actually make the decision.

Decision-making frameworks are a set of guidelines or processes that can help you to make decisions. Using these can result in consistent and effective results. They can also help with justifying and defending your decisions as you can provide evidence of your analysis.

While decision-making frameworks vary in design and purpose, they generally have common elements that include:

* identifying and formulating problems
* identifying clear goals
* highlighting key questions that help people scope problems and management options
* processes for building knowledge and applying appropriate analytical tools to assess actions, options, trade-offs, risks, and uncertainties
* connecting decision-making authorities to outcomes associated with those decisions.

In addition to these common elements, decision-making frameworks generally provide:

* transparency about goals, information, and decision processes
* inclusiveness of relevant participants
* structures or processes to adapt decisions over time in response to new goals, changing circumstances, or new knowledge.

Before you begin the decision-making process determine the following:

* The timeframe for making the decision. Is there a deadline for deciding and what are the consequences of missing this deadline? Is there an advantage in making a quick decision? Will spending more time improve the quality of the decision?
* Who is accountable and responsible for the final decision?
* How important is it to make a decision? How important is it that the decision is right?

### Decision-making framework

Use these 7 steps to solve problems and make decisions:

1. Identify the problem clearly
2. Establish the desired outcomes
3. Analyse the problem to determine its causes
4. Generate alternative solutions or options
5. Evaluate alternatives and select the most suitable
6. Implement the decision
7. Monitor and evaluate results.

As you read through the steps, you will see how your critical thinking and research skills can be applied. For example,

* your problem-solving skills to evaluate and challenge ideas and move towards solutions
* your formal analytical thinking techniques for identifying issues and generating solutions, seeking input from others as required.

Resources

Learn more about decision-making frameworks in the workplace:

* [An effective framework for strategic decision-making](https://blog.hellostepchange.com/blog/an-effective-framework-for-strategic-decision-making)
* [Effective Decision Making – A Framework](https://www.skillsyouneed.com/ips/decision-making2.html)
* [Untangling your organization’s decision making](https://www.mckinsey.com/business-functions/organization/our-insights/untangling-your-organizations-decision-making)
* [3 Frameworks For Making Complex Decisions](https://medium.com/swlh/3-frameworks-for-making-complex-decisions-6a77099c9683)

## Document research

You are now ready to present your research.

You will present the information you have gathered in a logical format using the organisation’s report template, where available.

The order of your research document headings and subheadings will depend on the objectives of the research. A simple order is to provide:

1. A summary of the topic or problem.
2. Background information for context.
3. A complete description or analysis of the main ideas using the research to support your main message.
4. A conclusion or solution or outcome.
5. Recommendations.

### Tips for presenting findings

* Use clear, consistent headings and subheadings to indicate major points
* Short quotes or paraphrasing should add meaning to the report and be referenced correctly as an in-text citation
* Use diagrams, tables or graphs to assist meaning, especially for explicit technical information
* If the information is lengthy, provide links or appendices
* Use clear language and communication protocols appropriate to the reader or audience
* Use a format appropriate to the context and audience
* Your conclusion and recommendation should have no new content as this is covered in the body of the report

### Referencing

When researching for any formal purpose, such as presenting a workplace proposal, it's very important to keep track of your sources and make notes as you go. Sources of research used for a formal report are often listed in a bibliography or reference list. These may also be annotated with notes about the validity of the source. This will help you in evaluating your sources and deciding which ones to explore in more detail.

Word processing applications will usually have tools you can use to record your sources and automatically create a bibliography. Annotations will usually have to be added manually however these can be recorded separately and copied in when you have finalised your list.

When you write your report, you must use in-text citations for quotes and paraphrasing and a reference list.

This is an example of an **in-text citation**:

One of the threats of AI chatbots is that ICT workers may lose their jobs. However, university experts explain that ‘due to its inherent lack of reliability, we do not see automation as the most like area of application.’ (Riemer and Peter, 2023).

This is an example of the **full reference**:

Riemer, Professor K and Peter, Dr Sandra, 6 November 2023, *AI chatbots are coming to your workplace but are not necessarily coming for your job*, Sydney University, <https://www.sydney.edu.au/news-opinion/news/2023/11/06/ai-chatbots-are-coming-to-your-workplace.html>

Resources

TAFE NSW Libraries provides excellent resources for [Researching and referencing skills](https://tafensw.libguides.com/research/referencing) including a TAFE NSW citation generator and Chat with a library team member function.

Microsoft provides written and video instructions on how to [Create a bibliography, citations and references](https://support.microsoft.com/en-us/office/create-a-bibliography-citations-and-references-17686589-4824-4940-9c69-342c289fa2a5).

If you’re not sure of any ICT-related terminology that you need to know when researching, you can use an online computer dictionary or glossary like the following sites:

* [TechTerms](https://techterms.com/)
* [DP Solutions IT Terminology Glossary](https://www.dpsolutions.com/success-center/it-terminology-glossary)

## Planning for implementation

Once you’ve researched, evaluated and decided on the emerging technologies and practices, you need to develop the strategies to prepare the organisation for implementation. This will include understanding the organisation’s objectives, identifying the changes required and identifying what implementation planning methods will be used. You will need to make recommendations for the organisational response and incorporate any feedback as necessary into your final proposal.

### Planning job tasks

In a different context, such as ICT support, employees may have varying degrees of flexibility in terms of how they decide which tasks to perform and when. In some circumstances, it won’t matter the precise order in which tasks are completed, so long as they’re completed to the required standard and deadline. This is one of the factors that can be motivating in a job role – the freedom and ability to decide when to complete individual tasks.

In other cases, the task order *will* matter and it’s important to know how to sequence those tasks appropriately. This is where it’s important to be able to access the organisation’s policies and procedures so that you have this understanding and knowledge.

Having established an understanding of what’s to be done in the work role, you should assess and prioritise your workload. This will help you plan your tasks to ensure that the most important or urgent priorities are tackled first and that time-sensitive activities are completed within the required timeframe. A useful place to start is with a to-do list. This is simply a list of tasks that are to be completed within a set time – this may be a day, week or month, depending on the context of your role.

Practice activity

### Activity 22: Plan work tasks

Read the question and select the correct answer.

1. Select **3** reasons to plan your own work tasks as an ICT support professional.

|  |  |  |
| --- | --- | --- |
| # | Choices | Answer/s |
|  | Good planning enables you to leave work early |  |
|  | Good planning enables you to complete your job tasks to the standards expected within the required timeframe |  |
|  | Good planning gives you the freedom to complete tasks in a sequence that is different to the workplace procedure |  |
|  | Good planning ensures that the most important and urgent tasks are completed first and that time-sensitive tasks are completed as a priority |  |
|  | Good planning improves job satisfaction as you cross off the items on your To Do list |  |

### ICT implementation plans

Operational planning identifies the programs or actions to achieve the organisation’s strategic goals. An operational plan may include the following elements:

* developing goals and objectives
* conducting a gap analysis between the as-is and to-be state
* acquiring resources required to meet the goal including hardware, software and personnel.
* writing a detailed implementation plan
* implementation of the plan
* monitoring and reporting on progress
* evaluating the success of the plan and areas to improve.

#### Developing goals and objectives

Goals in a plan explain the purpose of the plan. Goals can be broken down into more specific short-term objectives. Or in this case, what is the organisation trying to achieve by implementing an emerging technology or practice? Objectives provide a focus and direction for the team.

SMART goals are generally used to help guide the objectives. SMART stands for:

* Specific
* Measurable
* Achievable
* Realistic
* Timely/timebound

Understanding the organisation’s objectives will help you in developing your strategies.

The Key Performance Indicators (KPIs) will identify the measure of success. For example, a KPI may be ‘time to log service desk requests’ or ‘rate of satisfaction with service’.

Resources

Learn more about SMART goals at [What is a SMART Goal?](https://corporatefinanceinstitute.com/resources/knowledge/other/smart-goal/)

Practice activity

### Activity 23: SMART

Read the questions and select the correct answer.

1. What does the acronym SMART stand for?

|  |  |  |
| --- | --- | --- |
| # | Choices | Answer/s |
|  | Simple, Methodical, Achievable, Realistic, Timely/timebound |  |
|  | Specific, Measurable, Achievable, Realistic, Timely/timebound |  |
|  | Specific, Measurable, Actionable, Result-Oriented, Timely/timebound |  |
|  | Specific, Measurable, Achievable, Relevant, Timely/timebound |  |

1. Select the correct example of a SMART goal.

|  |  |  |
| --- | --- | --- |
| # | Choices | Answer/s |
|  | We will create an AI-based Application Tracker by the end of this quarter, after we shift Talent Management to a digital platform. |  |
|  | We will create an AI-based Application Tracker after we shift Talent Management to a digital platform. |  |
|  | We will create an Application Tracker after we shift Talent Management to a digital platform. |  |
|  | We will create an AI-based Application Tracker by the end of this quarter. |  |

#### Conducting a gap analysis

In this phase of planning, you are identifying changes required.

In the evaluation phase, you will have identified the potential impacts, opportunities and threats of the emerging technologies and practices. These will affect the changes that the organisation will need to make to their current technologies and practices.

Issues to consider include the following:

* strategies to prepare organisation for impacts of emerging technology and practices such as retraining employees
* the impact on and changes required to current technologies and practices.

Resources

Learn more about assessing the impact of technology and practices on an organisation:

* [How to Assess the Risk of a Change with 5 Simple Questions](https://www.joetheitguy.com/how-to-assess-the-risk-of-a-change-with-5-simple-questions/)
* [Business Impact and Risk Analysis in ITIL Service Design](https://blog.masterofproject.com/business-impact-risk-analysis/)
* [How your organisation can identify and respond to technology megatrends](https://toppandigital.com/translation-blog/organisation-identify-respond-technology-megatrends/).

#### Acquiring resources

Resources for each plan will vary. You need to ensure you have or can obtain the capacity, knowledge and systems your plan needs to succeed. Resource requirements include the following:

* budget
* materials and equipment
* people with the right knowledge and skills. these may be internal and external, temporary or permanent, on-site or hybrid.
* systems
* policies and procedures.

Follow the organisation’s procedures for requesting funding and other resources. This will usually involve you collaborating with your team leader, manager or other relevant personnel.

#### Developing strategies for implementation

Now you know your goals, you need to develop specific plans to reach the goal. Some of the elements in the implementation plan include the following:

* **Activities and actions**: what needs to be done
* **Roles and responsibilities**: who is doing the tasks
* **Timelines**: when are tasks being started and completed
* **Communication**: what needs to be communicated to stakeholders and team members, when how and by whom
* **Risk analysis and contingency plans**
* **Training and development** to support the team and users.

When developing strategies for implementation, you’ll need to consider several things, such as:

* data migration
* security
* storage
* timelines
* training
* contingencies.

Video

Review the following LinkedIn Learning courses to find out about planning for digital transformation for organisations:

* [Digital Transformation](https://www.linkedin.com/learning/digital-transformation-2?u=57684225&auth=true) (LinkedIn Learning 47:28 mins)
* [Ch 2. Planning Your Technology Project](https://www.linkedin.com/learning/project-management-technical-projects/planning-around-your-constraints?u=57684225&auth=true) (LinkedIn Learning 24:05 mins).

LinkedIn videos will open in a new browser tab. Access the full video by logging in with your TAFE NSW username and password. Go to the transcript tab to access the video transcript. When you’re finished, close the tab and return to this unit. [LinkedIn Learning Support: Getting started](https://tafensw.libguides.com/linkedinlearningsupport/gettingstarted) (TAFE NSW Libraries) has more information.

#### Managing change

Without a well-defined change management plan, organisations may struggle to navigate the complexities associated with adopting new practices. A structured approach that addresses communication, training, and support can increase the likelihood of successful adoption. Elements of a change management plan include the following:

* managing and addressing employee concerns and resistance to change
* clear communication and education about the advantages and implications of the new practice are crucial for successful adoption
* providing adequate training in new technology and practices
* leadership commitment and support for the change
* investing in the resources required for the change
* influence the organisational culture to overcome fear of failure and complacency with current technologies and practices
* supporting the change with new ways of working, team structures, policies and procedures.

#### Implementing the plan

Once the implementation plan is complete and it has been communicated to the relevant people, it can be approved and put into action.

Depending on the type of change, the implementation phase may include a pilot or trial to test it first.

#### Monitoring and reporting on progress

Important parts of your plan should be monitored such as timeframes, service levels, output and budgets. You are comparing what is happening during implementation with what should be happening.

If there is a variation to the to the plan and they are important, implement your contingency plans or carry out a gap analysis to determine the options for actions.

Organisations use project software such as Trello as monitoring tools.

#### Evaluating the success of the plan and areas to improve

Your team will conduct either a formal or informal evaluation of the operational plan after a period of time. The purpose of the evaluation is to:

* learn from areas that went well and to apply them to further projects
* examine opportunities to make small enhancements for continuous improvements
* identify areas that did not perform to expectations and identify the reasons.

Practice activity

### Activity 24: Planning a communication campaign

1. Sequence the steps from 1 to 9 for planning a communication campaign promoting the use of digital collaboration tools at work.

|  |  |
| --- | --- |
| Order | Steps |
|  | Upload digital campaign materials to your organisation’s channels |
|  | Design campaign graphics |
|  | Make necessary changes from Branding/Marketing review |
|  | Brainstorm campaign concept |
|  | Have the Marketing department review produced materials |
|  | Shortlist campaign ideas |
|  | Write the copy |
|  | Produce campaign |
|  | Storyboard campaign ideas |

Self-check

### How did you go?

You have completed the topic: **Emerging technologies and practices**. Check the boxes for the tasks you feel confident you can complete. I know how to:

research and evaluate the purpose, features, attributes and potential applications of emerging ICT technologies and practices

develop strategies and plans to respond to emerging technologies and practices

use systematic research methods.

Assessment

As you have completed this topic, you should be ready to complete:

* Assessment event 1: Knowledge - Part 3 Emerging technologies and practices
* Assessment event 2: Project

Before you begin you should review:

* Unit Assessment Guide
* Assessment Event: Knowledge 1 of 4
* Assessment Event: Project 2 of 4

If your assessments are online, go to Assessments in the top menu and access the files.

Topic 4: ICT skills

## Overview

In ICT, you will communicate with internal employees, clients and vendors. This topic describes the skills and knowledge required to interact and communicate with others at work.

In this topic you will learn to:

* identify and apply professional communication practices in ICT
* communicate with management
* plan for and make a presentation
* provide advice to the client and seek and record client feedback
* incorporate feedback and self-reflection to critically assess my own performance.

In Topic 3, you learned about evaluating emerging technology and practices. In this topic, you will use a range of skills to communicate to management, colleagues and clients about ICT.

## ICT skill fundamentals

As an ICT professional, you will apply many personal skills as you work, including, writing, verbal communication, interacting with others, planning, teamwork, reflection and professional development.

Whether your job is in technical support, network administration, web technologies, software applications or digital media technologies, you can develop and apply these personal skills to improve your performance.

### Legal and organisational requirements

In Topic 1, you learned about policies, procedures, laws and regulations applicable to your role in ICT.

These policies, procedures, laws and regulations also apply to your interactions and communications with others at work. You need to take personal responsibility for adherence to legal and regulatory responsibilities relevant to own work context.

Go to [Gelos Enterprises](https://share.tafensw.edu.au/share/items/d0b458dc-3922-409d-b1fe-9a2f785f4a38/0/?attachment.uuid=5f1677bf-8296-4137-ae33-8b9e30bad1ab)’ website and locate examples of workplace policies and procedures that set out employee responsibilities for interacting with others and communication.

Gelos Enterprises’ [Code of Conduct Policy and Procedure (pdf)](https://share.tafensw.edu.au/share/items/5f1cec7b-1d03-446a-85b7-edb42692c34e/0/?attachment.uuid=6b7e28d5-5226-450d-9ee8-b2567497512d) requires employees to:

* behave with courtesy, respect, kindness, and show consideration for the rights of others
* refrain from harassing others or discriminating based on gender, race, religious belief, political affiliation, pregnancy, disability, sexual orientation or health
* act honestly and respectfully, responding in good faith towards others
* uphold confidentiality and respect the privacy of others
* behave with sensitivity to the wellbeing of others
* control risks in the workplace within the constraints of the role.

Use organisational templates to ensure consistency and compliance in your communications. Templates include:

* Email template
* PowerPoint template
* Meeting agenda template
* Word document template.

Communication policies and procedures will include areas such as:

* the language and tone for communications, such as:
  + using communication that is professional and respectful
  + not using offensive language in the workplace
* the methods to engage with external contacts, such as:
  + contacting customers by email in the first instance, followed by telephone and then letter
  + providing suppliers with orders in writing and giving a purchase order number
* branding:
  + including an organisation’s logo and contact information in standard written communications and emails.

Practice activity

### Activity 25: Code of conduct

Read the question and select the correct answer.

1. Select **3** applications of a code of conduct to workplace interactions and communications.

|  |  |  |
| --- | --- | --- |
| # | Choices | Answer/s |
|  | The code of conduct explains the responsibilities of employees towards each other |  |
|  | The code of conduct explains job role communication tasks |  |
|  | The code of conduct provides guidance on protocols for personal and professional conduct |  |
|  | The code of conduct sets standards of behaviour that ensure the organisation meets its legal and ethical responsibilities |  |
|  | The code of conduct applies to interactions and communications between employees, not to communications with external parties such as vendors |  |

### Responsibilities and authority

It is also important that you establish your responsibilities and authority to participate in communications. This will tell you what your limits and boundaries are, as well as the conventions and protocols, and when you should communicate with others.

Responsibilities and authority will be relevant to:

* your role and job level
* any personnel you manage or coordinate work with
* your work team.

Some communications will be standard to your workplace, such as team briefings, work discussions, managers’ meetings, email notifications and employee consultations. Regular communications will be conducted as part of everyday business in your job role.

Other communication is infrequent or a one-off that you may be less familiar with. You may need to obtain permission to do these and confirm that you have the authority to engage with others at the required level. Authority may relate to decision-making powers and to the information that you can disclose and discuss.

For example, if an external vendor needs to renegotiate supply terms, you should check that you are able to do this and that you have the correct knowledge and authority to discuss, negotiate and agree on new terms.

Confirming your authority to present information and material may include:

* informing management that a communication needs to take place
* seeking authority to perform this
* discussing the purpose of the communication and what needs to be achieved
* obtaining information, materials or the input of management when planning the communication
* agreeing on a course of action or communication strategy that is in line with organisational requirements.

Resources

Download and review these policies and procedures from [Gelos Enterprises](https://share.tafensw.edu.au/share/items/d0b458dc-3922-409d-b1fe-9a2f785f4a38/0/?attachment.uuid=5f1677bf-8296-4137-ae33-8b9e30bad1ab) to understand the responsibilities of employees when interacting and communicating with others.

* [Communication Procedure (pdf)](https://share.tafensw.edu.au/share/items/5f1cec7b-1d03-446a-85b7-edb42692c34e/0/?attachment.uuid=55d8c18c-98ab-44da-a3ca-a904133bab2d)
* [ICT Governance Policy (pdf)](https://share.tafensw.edu.au/share/items/5f1cec7b-1d03-446a-85b7-edb42692c34e/0/?attachment.uuid=7041aeea-1a17-4f66-839d-f96f5c24d143)
* [Privacy Policy (pdf)](https://share.tafensw.edu.au/share/items/5f1cec7b-1d03-446a-85b7-edb42692c34e/0/?attachment.uuid=df50b7f8-f190-4a3c-aad0-83297b3c395d)
* [Discrimination, Harassment and Workplace Bullying Policy and Procedure (pdf)](https://share.tafensw.edu.au/share/items/5f1cec7b-1d03-446a-85b7-edb42692c34e/0/?attachment.uuid=d5d949c7-ee48-410b-8059-c9a2f5085a2e)

## Communication practices

Communication is any behaviour (verbal or non-verbal) that is perceived by others.

**Non-verbal communication**, sometimes called body language, is the parts of your message that are not encoded in words, such as tone of voice, facial expression, gestures and movement.

One goal of your communication in an ICT environment is to create a climate where people feel comfortable to suggest, explore, adapt and adopt new ideas as a regular part of work life. To meet this goal, your communication practices should include:

* selecting and using the required conventions and protocols when communicating with colleagues, clients, managers and others in a range of work contexts
* looking for ways of establishing connections and building genuine understanding with a diverse range of people
* demonstrating advanced control over oral, visual and written communication formats and drawing on a range of communication practices.

### Communicating with management

In ICT, you will interact and communicate with management in many contexts, including:

* sending information to management
* seeking and receiving feedback
* negotiating
* consulting
* discussing ideas and complex information
* problem solving
* decision making.

The best communication will flow upwards from team members to management and downwards from management to team members. Management and colleagues will also provide you with feedback.

Feedback is essential to effective communication. Feedback helps with the following:

* establishing that those that received your message understand it in the way you intended
* eliciting a response to your information so you can make changes if required
* getting advice from others
* following-up
* developing good working relationships and a positive communication climate.

Practice activity

### Activity 26: Non-verbal behaviours

Read the question and select the correct answer.

1. Select **3 non-verbal** behaviours to show you are listening to feedback effectively.

|  |  |  |
| --- | --- | --- |
| # | Choices | Answer/s |
|  | Head down |  |
|  | Direct and regular eye contact |  |
|  | Staring or glaring |  |
|  | Friendly and courteous facial expression |  |
|  | Leaning forward and finger pointing |  |
|  | Upright and relaxed posture |  |

### Communication methods and channels

Methods or channels of communication include face to face and via telephone, video conference, emails and reports.

So how do you choose the appropriate methods, channels and forums? One thing to consider is the context of the communication:

* Do you need a written record of the communication?
* Is it urgent?
* Is the message complicated?
* Do you need immediate feedback?
* Do you need to see and/or hear the other person?
* Who is the audience? A work colleague (informal) or higher management (formal)?
* Is the message or information formal or informal?

Video

The following courses and videos from LinkedIn Learning include information about communication strategies that you can use when communicating with people in your organisation, as well as communicating with ICT clients. You can watch the whole courses, or just the parts that you need:

* [Understanding business writing](https://www.linkedin.com/learning/business-writing-principles/understanding-business-writing?autoplay=true&resume=false&u=57684225) (LinkedIn Learning 01:57 min)
* [Making your writing courteous](https://www.linkedin.com/learning/business-writing-principles/making-your-writing-courteous-15158856?autoplay=true&resume=false&u=57684225) (LinkedIn Learning 03:58 min)

LinkedIn videos will open in a new browser tab. Access the full video by logging in with your TAFE NSW username and password. Go to the transcript tab to access the video transcript. When you’re finished, close the tab and return to this unit. [LinkedIn Learning Support: Getting started](https://tafensw.libguides.com/linkedinlearningsupport/gettingstarted) (TAFE NSW Libraries) has more information.

## Written communication

Information is often conveyed in writing. In your job, you may need to prepare a range of documents, such as emails and reports. Other written tasks may involve taking messages and completing workplace documentation.

When writing any of these types of documents, apply the following rules:

* use accurate spelling, grammar and punctuation
* use appropriate tone, format and style
* use short, simple and correct sentences
* use legible handwriting
* use plain English
* avoid jargon
* accompany technical detail with an explanation
* proofread and edit.

Your organisation’s style guide provides the information you require for logos, colour and fonts, writing style and presentation slides.

Resources

Access and read these policies and procedures to learn about written communication standards at Gelos Enterprises:

* [Style Guide (pdf)](https://share.tafensw.edu.au/share/items/5f1cec7b-1d03-446a-85b7-edb42692c34e/0/?attachment.uuid=7f4fb7d3-3c6e-4e89-ad1b-2443d7e7b2fe)
* [Writing Style Guide (pdf)](https://share.tafensw.edu.au/share/items/5f1cec7b-1d03-446a-85b7-edb42692c34e/0/?attachment.uuid=3b461b48-f0c0-4229-bfb1-fa4fc23ff9fc)

### Emails

You will write emails regularly to internal and external contacts. In many organisations, email is a formal method of communication and can be kept as evidence of your actions and a record of decisions, as with any other forms of documentation.

It’s important to remember that when you communicate by email, the non-verbal communication (body language) isn’t coming through along with the written message. If you’re concerned that anything may be misinterpreted, it’s a good idea to explain it or just keep it simple.

#### Tips for writing emails

* Begin the email with a greeting and then statement of the purpose of the message
* Use short sentences
* Create short paragraphs of 3 to 4 sentences
* Use bullet points to improve readability
* Minimise the use of acronyms and jargon, depending on your receiver
* Use headings in a longer email
* Close the email with a call to action: what do you want the receiver to do
* Proofread the email: is it professional, clear, free of spelling and grammatical errors, providing an accurate record of a work activity?
* Check that attachments are actually attached before sending

Resources

Access and read these policies and procedures to understand the email protocols at Gelos Enterprises.

* [Writing Emails Checklist (pdf)](https://share.tafensw.edu.au/share/items/b7f3345c-19b3-422a-8b3c-5eb1d2950cee/0/?attachment.uuid=850bbdc5-2adf-40d7-a4eb-a31a53207a6f)
* [Email Template (dotx)](https://share.tafensw.edu.au/share/items/02285ff1-cfb2-4af4-b402-fdc23bf4bf11/0/?attachment.uuid=2a6ed3d4-ca14-427f-8583-ceb6bcb08c1b)

### Reports

A report is a specialised form of writing in which a specific problem or issue is examined in detail. The qualities of a good report are:

Table 9 The qualities of a good report

|  |  |
| --- | --- |
| Qualities | Description |
| Accuracy | The information in the report must be correct and relevant sources must be referenced. |
| Clarity | There is attention to the format of the document, choice of words, sentence and paragraph construction and presentation to meet the needs of the audience |
| Coherence | There must be a logical and continuous relationship between the parts of the report. |
| Conciseness | The writer only includes what is relevant while using a courteous style |
| Objectivity | The content of the report is impartial and may include diverse perspectives. The writer does not let their personal feelings impact the analysis and writes in the third person, avoiding ‘I’, ‘my’ and ‘we’ unless required. |
| Complete | The report content sufficiently meets the objectives or purpose of the report. The key themes and ideas are explored. |
| Consistency | The writing is consistent in tone, style of formatting and choice of words. It uses clear language and formats required for the audience to convey explicit technical information, requirements and recommendations. The document is formatted following organisational templates. |
| Version | Reports must also include version control conventions so that subsequent iterations that incorporate feedback from others are clearly identifiable. |

#### Parts of a report

Not all report parts are the same, depending on the type of report and the audience. There are some common parts, as follows:

Table 10 Parts of a report

|  |  |
| --- | --- |
| Part of report | Content |
| Report details | * Title * Author/s * Audience – who the report is written for * Date * Version |
| Introduction | * Topic * Purpose of the report * Summary paragraph or overview of the entire report |
| Findings or body | The main content of the report organised into sections with headings and subheadings such as:   * facts and figures * objective information * issues and risks * discussion and analysis |
| Conclusion | * Summary of findings * Evaluation of information |
| Recommendations | Subjective opinion on what reasonable, achievable actions should be followed |
| Reference list | An accurate list of the sources of all the material cited |

Resources

The [TAFE NSW Library Guide’s](https://tafensw.libguides.com/research/writing) report writing tab provides some useful information, links and e-books about report writing.

## Verbal communication

As well as communicating in writing, there will also be times when you need to speak to colleagues, managers and clients. This could be in a meeting, in a presentation, face to face, over the telephone or via video conference.

The purpose of verbal communication can be:

* to exchange ideas
* find out the views and opinions of others
* persuade someone to take an action or decide
* discuss ideas and information.

Listening and questioning techniques will help you communicate effectively in these situations.

### Active listening

Active listening happens when you focus on the message you’re receiving from the other person, without thinking about what you want to say next. Your response to the sender is one that paraphrases what you’ve heard: this means that you summarise what you’ve heard and say it back to the sender in your own words. This ensures the other person that you’ve understood the idea they wanted to give you.

You can often tell if someone is really listening to you if they’re:

* smiling
* nodding
* staying silent
* making eye contact
* using a friendly and interested tone of voice
* encouraging you to continue
* asking open questions
* reflecting how you (the speaker) are feeling
* leaning towards you (the speaker).

### Questioning techniques

A colleague or client may be confused or have limited knowledge about the technology they use. They may be frustrated or angry. As an ICT support worker, you will need to practice self-management techniques to stay calm and focused to successfully resolve issues for the customer. These questioning techniques are also useful in discussions with team members and stakeholders and for applying critical thinking skills.

Questions can be used in the following ways:

* to explore possibilities, using what-if (or hypothetical) scenarios
* to sort through a lot of information to get to the point or the problem
* to clarify what others are saying
* to help others plan or work out what to do next
* to go deeper into an issue or problem.

There are four types of questions that produce different kinds of answers and give you the right kind of information you need. Using a combination of these will ensure that your questioning is inclusive. The purpose of inclusive questions is to identify the client or colleagues’ strengths and abilities and use these to inform what information and support you will provide to that person.

These **four question types** are: closed, open, probing and confirming.

Table 11 Question types

|  |  |
| --- | --- |
| Question types | Description |
| Closed | Closed questions lead to answers that are short. Typically, they are looking for a ‘yes’ or ‘no’ response or a few brief words. The common question words include verbs like can, may, will, have, could, would, should, is and does. Using these verbs helps you narrow down the enquiry. In some situations, you may also want to let the customer know that you'll be asking them a series of these short answer questions. This will help you focus on the issue; help guide or focus the call and keep the conversation on track. |
| Open | Open questions lead to more information and often start with the question word ‘when’ or ‘how’. Open questions encourage the customer to give more information. They help build rapport by allowing you to have a conversation about the issue and listen to the answers. Use open questions to lead the customer to tell you more, such as about when they first noticed that the problem started.  **Note:** When using open questioning techniques, try a different way to phrase a question other than with the word ‘why’. If you use ‘why’, a customer may think you are being impatient or judgemental, even if you are only trying to troubleshoot their issue. |
| Probing | Probing questions go into the issue in more depth and detail. For example, ‘What is your preferred outcome and why is this important?’ |
| Confirming | Confirming questions lead to agreement or consent from the customer, such as checking that the customer does not need any more assistance and has no more questions before you end the call. An example of this is, ‘What has been helpful so far?’ |

Resources

Business Queensland provides some tips for improving business communication with colleagues, vendors and clients through [Communicating effectively](https://www.business.qld.gov.au/running-business/marketing-sales/sales/communicating-effectively) in person and online.

## Presentations

Before you give a presentation, consider how you will prepare and deliver your presentation in a manner that is appropriate to the context and setting of the presentation. The context may be an informal gathering or a formal public presentation. Considering the following elements will ensure you deliver a confident, well-paced and engaging presentation.

### Presentation plans

Planning and designing a presentation will ensure it is relevant to your purpose and to the audience. To prepare effectively take responsibility for planning, sequencing and prioritising tasks and own workload for efficiency and effective presentation outcomes. Planning your presentation will reduce your anxiety related to delivery, mitigate the risks of the presentation going off track and ensure the presentation activities and aids work effectively.

### Elements of a presentation plan

A presentation plan will include the following elements:

#### Title

**The title of your presentation should encapsulate the content so that the audience knows what to expect.**

#### Audience

The audience is the individuals and groups who will listen to your presentation and discuss the content. To help you identify your audience, there are a number of questions that you must answer:

* Does your audience consist of new or experienced employees?
* Does your audience consist of technical experts or generalists?
* What are the diverse needs of your audience such as having an interpreter?
* Are the members of the audience decision makers, collaborators or users?

These questions can guide you in developing a presentation plan that is suitable for your audience. For example, if your audience consists of employees from the ICT department, your training methods must be relevant to the practices used by the ICT department.

Adapt your presentation’s format, tone and content to suit your purpose and audience. If you do not target your audience, you may present material that is too difficult or too basic and miss the needs of the audience.

Audience members may have previous experience with a topic that is the focus of a presentation. This experience may have been gained at work, in previous training and education or in their general life experience. Be aware that these factors may influence a person’s attitude toward the topic, their attention levels during the presentation and the types of questions they ask.

Reflect on the diversity of members of the target audience and plan your communication or presentation accordingly.

* learn about your audience’s cultural background to ensure that you understand differences in communication, body language, gender interactions and terminology that should be used or avoided
* be mindful of any religious or spiritual beliefs that audience members hold that may affect their participation in the presentation, and accommodate these sensitively
* model behaviour and attitudes that promote culturally-inclusive work practices
* avoid slang or colloquialisms and cultural stereotypes in your language and in any anecdotes, humour and support materials that you use.

#### Channel and forum

Deliver your presentation in a context and setting appropriate to the purpose. The context may be an informal gathering of colleagues; in a meeting; or in a formal, public presentation. The presentation may be delivered online or recorded for the audience to watch online.

Forums may include:

* board meetings
* trade conferences or exhibitions
* client meetings
* product demonstrations
* seminars
* supplier or vendor meetings
* project meetings and team meetings
* training sessions and induction meetings
* online presentations.

Which forum is appropriate or relevant will depend on the purpose of the presentation. Identify and match the mode of communication to the specific needs that you have.

Your presentation may be synchronous or asynchronous. A **synchronous** presentation is where the presenter and audience are interacting at the same time, whether this is in person or online. In an **asynchronous** presentation, the audience watches your presentation in their own time. The link to the recording of the presentation may be provided through an internal channel or be uploaded online such as through YouTube.

#### Legal, regulatory and organisational requirements

The legal, regulatory and organisational requirements for a workplace communication were discussed earlier in this topic.

#### Goal/s

Develop the presentation to achieve your goal and help the audience understand your message.

For example, your goal may be to influence the audience, to change their attitude, to convince them about a particular point, or to motivate them to act.

#### Content and main ideas

In this part of your presentation plan, plan and order the sequence of the content according to the agreed time available for your presentation. As your audience often has only one change to hear you, put your ideas in a logical order that is easy to understand. For example, if the goal of your presentation is to explain the features of new software, your content would include:

* features of software
* limitations of the software
* technical specifications.

Most presentations have a similar sequence or structure:

* **The** **introduction** which states the topic and catches the audience’s attention.
* **The** **body** that provides the information, informs, persuades and engages the audience.
* **The** **conclusion** that reinforces and summarises the main points.

To manage the time allocated for your presentation, there are a number of steps that you can take:

* **Identify the overall time** that is available for your presentation.
* **Schedule the actions that are essential** in your presentation. You may need to allot time for receiving and answering questions, discussions and clarifications, as well as time for snack and restroom breaks.
* **Schedule time for contingencies.** There is always the possibility of equipment malfunctions and technical difficulties that can impact the time you have for facilitating your presentation.
* **Analyse your activities.** Check if all of your tasks and activities are absolutely necessary; you may have some activities that can be conducted at a later time.

#### Activities and aids

Effective visual aids, materials and activities will support your presentation and engage your audience.

Your presentation may include audience interaction to establish connections and build understanding. You may include discussions, question and answers, case studies, break out rooms and scenarios.

For example, if the goal of your presentation is to explain the features of new software, your activities would include a group discussion on how the software could be used at this workplace.

Your aids and activities may include the following:

* computer simulations
* slide presentations
* audio recordings, video and animations
* training room tools such as smartboards, whiteboards, posters and models.

Be cautious to comply with copyright laws when selecting images, music and other effects.

#### Questions

You may develop a series of questions to be used strategically during a presentation to encourage reflective thinking and discussion; to check the audience's understanding of the content. Alternatively, the presentation could involve an individual or panel that is asked a series of structured questions by a facilitator. The questions are designed to elicit information relevant to the topic and purpose of the presentation.

Always provide time for the audience to interact or to query an issue. Some people feel let down if they are not allowed to comment or pose a question to the presenter about an issue that arises from the presentation.

#### Sample presentation plan

Table 12 Presentation details

|  |  |
| --- | --- |
| Presentation element | Details |
| Title | Workstation ergonomics |
| Audience | ICT team members and ICT Support Manager |
| Channel and forum | Meeting room with live stream via MS Teams |
| At least 2 legal, regulatory and organisational requirements | Gelos Enterprises  Work Health and Safety Regulation 2017 Regulation 39 – Provision of information, training and instruction |
| Presentation goal/s | To inform the team about the new organisational procedure related to workstation ergonomics |

Table 13 Presentation plan

|  |  |  |  |
| --- | --- | --- | --- |
| Timing (min) | Content | Audience activity such as discussion | Aids (including tools and technologies) |
| 1 min | **Introduction**  Welcome  Purpose of presentation | -- |  |
| 15 min | **Description of new procedure**  Q. What do you understand by the term ergonomics?  Q. When was the last time you checked the ergonomics of your workstation?  Describe the changes to the regulations leading to the change in procedure  Share a copy of a new procedure | Group discussion  Listen to presentations | PowerPoint slides  Share screen document |
| 5 min | **The decision-making process**  Q. How can we apply the new procedure to our work team? | Group discussion | Take notes |
| 5 min | **Agreed actions**  Summarise and record agreed actions  Organise follow up meeting | - | Record actions in notes |

### Making a presentation

You are now ready to deliver your presentation.

Using your presentation and the presentation aids, including digital tools and technology, present the information.

#### Oral communication skills

In a presentation that includes group discussions, use your oral communication skills to:

* articulate information and ideas
* convey technical information
* persuade the audience
* involve the audience in a decision-making process
* present recommendations
* reach agreement with others.

#### Tone and inclusive language

For your presentation, the tone must be appropriate for your audience. You should think about how the audience is most familiar and comfortable with receiving communications and what is reasonable for the setting. The approach must engage them, or you will quickly lose their interest.

For example, the tone may be:

* informal
* formal
* upbeat
* warm (friendly)
* serious
* academic
* factual
* investigative
* conversational.

In your delivery, model non-sexist and gender-inclusive language and also avoid cultural (including gender-based) stereotypes; for example, use case studies that include women in non-traditional roles and reflect the diversity of modern family structures.

Practice activity

### Activity 27: Select communication methods

1. Match the following communication activities with their respective communication methods.

|  |  |  |
| --- | --- | --- |
| Communication activities | Answer | Communication methods |
| 1. Respond to an urgent request for information |  | 1. Email |
| 1. Reporting on a project to the General Manager |  | 1. Telephone |
| 1. Activity update for a colleague |  | 1. Face to face meeting |
| 1. Discussion about a project with a new external client |  | 1. Formal report |

## Communicating with ICT clients

Many organisations have a specific organisational structure of workplace that includes functions for identifying and resolving client ICT problems. The tasks in these functions include the following:

* receiving client enquiries and recording issues and problems
* providing problem resolution advice to the client
* providing support to the client
* articulating and justifying the decision-making process
* obtaining, responding to and recording client feedback
* confirming client requirements have been met
* provide problem resolution advice and support to client.

When you are communicating with a client, your words and tone should be clear, polite and professional. You must also keep the client informed about how you have resolved or escalated their issue.

Since parts of a written response will be the same each time, a common approach is to choose from a range of templates that you can then tailor to the customer. Many organisations will have a range of prepared responses. However, it is important to note that in a case where a customer did not receive good service, then you will need to write a more personal response that covers that specific situation.

For every customer enquiry process, you should include certain elements, such as a greeting and the customer’s name, the details of the enquiry, and the action you will take or the result of that action, as well as information about when you will follow up, or that the issue has been resolved. Your organisation will usually have a set of templates ready for the ICT support team to use.

Another common type of communication template is used after the enquiry. This is usually a survey that asks the customer for feedback about their experience. The organisation uses this feedback in quality control.

Video

The section [Anatomy of a Contact](https://www.linkedin.com/learning/it-service-desk-customer-service-fundamentals/contact-greeting-and-validation?u=57684225&auth=true) (LinkedIn Learning 19:59 mins) in the LinkedIn course *IT Service Desk: Customer Service Fundamentals* has an excellent overview of the stages of a customer support call, along with recommendations for how and when to use the questioning techniques. You can watch all the videos in this section or just the ones you need.

LinkedIn videos will open in a new browser tab. Access the full video by logging in with your TAFE NSW username and password. Go to the transcript tab to access the video transcript. When you’re finished, close the tab and return to this unit. [LinkedIn Learning Support: Getting started](https://tafensw.libguides.com/linkedinlearningsupport/gettingstarted) (TAFE NSW Libraries) has more information.

### Inclusive communication

People who work as ICT professionals have a great deal of technical knowledge, which allows them to do their job well. However, ICT language uses a lot of acronyms and abbreviations that others might not understand.

This means that you should be careful about using technical words when talking to clients. Sometimes, if you’re talking to someone who understands the terms, then a highly technical explanation is appropriate. However, technical words can often make clients defensive. This can make it harder to identify what’s gone wrong or for them to understand your solution.

The language you use when communicating with clients is very important: not just the way you speak, but how you speak. The communicated message should be concise, direct, purposeful, correct, courteous and culturally sensitive. Use a clear and audible voice as well as a courteous tone when speaking to clients.

There is certain etiquette to follow in the workplace when communicating on the telephone, by email or any other form of communication. Etiquette refers to unspoken rules that guide the way people communicate and behave.

Examples of general telephone etiquette when answering the phone in the workplace include:

* using a positive tone and say, ‘good morning’ or ‘good afternoon’
* stating the name of the organisation you are working for
* introducing yourself
* asking the person how you might help them.

It’s important to remember that when you communicate by email, the non-verbal communication (body language) isn’t coming through along with the written message. If you’re concerned that anything may be misinterpreted, it’s a good idea to explain it or just keep it simple. It should also be noted that in many workplaces, email is a formal method of communication and can be kept as evidence of your actions, as with any other forms of documentation.

#### Keeping the client informed

Keeping the client informed is one of the key features of best practice in client service. It’s important to let the client know the status of their request from beginning to end.

This includes every step in the process – from explaining why, if you need to put a client on hold or must transfer them to another person, to letting them know what progress has been made if hardware needs to be ordered for their system.

Your organisation may have a policy statement or an item in your service level agreement that states what level or means of follow-up with the client is required. This might include:

* phoning the client after service has been completed
* sending out feedback surveys to client about the service they received
* sending an email asking the client to respond
* employing an independent person or company to interview clients.

#### Confirming client requirements

Before any advice can be provided, the details of what the client requires must be documented, understood by both parties and then confirmed.

The first step to gathering requirements is to communicate with the client and determine what they need. One technique for confirming requirements is to ask the question ‘What is the benefit?’ If there is no benefit, then either the requirement is not warranted or there is a misunderstanding about what is being requested.

As an example, an employee has requested a new computer after complaining that the current one is too slow and just isn’t good enough. After meeting with the client, you find out the employee does a lot of work with photo editing software. You examine the computer and notice it is only a few months old. The CPU is good, but only 4 gigabytes of RAM is installed. As a result, you advise the client that a new computer is not required and instead offer to install additional RAM.

There are many techniques available for gathering information and confirming requirements such as:

* one-on-one interviews and group interviews
* questionnaires
* prototyping
* user cases (user stories)
* observation.

Gathering information on requirements also typically includes consideration of any time and cost constraints. When does it have to be done by? What will it cost?

In some cases, a feasibility report is required to determine if something is worth the cost. As an example, it might not be feasible for a small organisation to purchase and maintain a server just to store less than 300 gigabytes of data. A cloud storage service such as One Drive or Dropbox might provide better value.

#### Documenting the requirements

Documentation is another way of confirming requirements. This provides a method for recording the details, terms and timelines for a request. It often provides clarification and a reference for the future. There are many products available for recording and managing requirements.

An example of information that can be recorded is provided below.

Client name:

Project name:

**I understand your requirements as follows:**

[Product A]:

* To be delivered within one week of the contract being signed
* 12 lots of [Product A] required

[Service A]: To be provided within 2 days from the delivery date of [Product A]

[Product B]: [Product B] must be compatible with existing network

[Product C]:

* Must be able to be used in outdoor locations without risk of damage
* Must be cheaper than the existing product

**Our signatures on this document confirm our shared understanding of the above requirements in this project.**

Client signature:

Service provider signature:

Date:

The client requirements confirmation form is completed with very specific information about the current project. The signature of the client, as well as your signature, indicates a shared understanding of the project. Alternatively, an email could be sent to confirm your understanding of the client’s requirements.

The most important characteristic of any of these documents is to record two key items accurately:

* the service which is to be provided to the client
* the time frame in which it must be delivered to the client.

Costs may also be included in these documents if appropriate. Time taken to get this stage of a project correct will save many hours later on.

#### Obtaining approval

An approval process helps organisations ensure adequate consideration is given to what has been requested. Some larger organisations require two or more quotes from different providers before anything is approved. This requirement ensures that a variety of options have been considered and that well-informed decisions are likely.

Obtaining approval might happen in a number of ways. Different sized organisations will have different requirements and approval processes. A small business might just need verbal approval followed by an email that outlines the details. Larger organisations will have an established workflow where approvals are required at different levels of a reporting line. For example, a large organisation might first require the written approval of a manager followed by the director’s written approval.

One way of obtaining approval is to have the client provide a written purchase order for the work. Alternatively, the client might write a letter outlining their agreement to your requirements document, asking you to go ahead with the work. Lastly, a contract can be drawn up whereby the client can formally sign an agreement.

Any approval document that is produced should include agreement on:

* the standard of the goods or services to be provided
* the price of the goods or services to be provided
* the timelines for the project (either broken down into timelines for specific tasks or for the entire project)
* any ongoing or follow up services required or foreseen.

Remember, a person’s signature is generally required for an agreement to be legally binding. You should ensure that an authorised person from your client’s organisation signs all documents before you begin any work.

Implementation of a solution should not go ahead until the client has approved all aspects of the project outlined in the documentation.

### Obtaining feedback

Obtaining and reviewing stakeholder feedback helps the organisation to determine how effective their service is, whether this is providing ICT support or presenting a proposal. Stakeholders can include clients, management or anyone who has an interest in the service. Feedback is needed to determine if your efforts have provided guidance, improved understanding or reduced issues or problems.

Client feedback is very useful to ensure client satisfaction, which is an important business goal. Although some people consider any negative feedback as criticism, there is generally a positive aspect to it. Make your feedback constructive by noting the positive as well as what needs to be improved. It’s vitally important to examine feedback and identify areas of improvement. The ability to change and improve will ensure success in any business. You should approach client feedback with the attitude that you can do better next time, especially if you consider feedback as being genuinely valuable.

A client can be invited to give feedback using a range of channels. Often, an ICT client will be asked for feedback at the end of a support call or online enquiry when their experience of the service is fresh and immediate.

For a formal evaluation, you would develop some type of tool to gain documented, structured feedback, such as an online survey. This type of feedback provides a quick and immediate response (if the client replies).

Resources

Read the Qualtrics article [How to use IT help desk surveys to increase satisfaction](https://www.qualtrics.com/blog/it-help-desk-surveys/) to learn about strategies to obtain client feedback and confirm that their requirements have been met.

## Reflection

Reflection involves asking very personal questions of ourselves to explore the reasons behind our choices and rationale for our actions. One reflective tool used in various professions is Gibbs' Reflective Cycle used to reflect on incidences.

Description (what happened?)
Feelings (what were you thinking and feeling?)
Evaluation (what was good and bad about the experience?)
Analysis (what else can you make of the situations?)
Conclusion (what else could you have done?)
Action plan (if the situation rose again what would you do?)

Figure 3 – Gibbs' Reflective Cycle © TAFE NSW 2023

You may use reflection to:

* identify factors that are affecting your performance
* consider alternative approaches to situations
* consider the effectiveness of a particular approach or decision
* make notes on actions, identifying successful and unsuccessful approaches
* consider the effectiveness of a particular communication method or technique
* modify time management and priority planning for future reference.

Reflection **in** action occurs during an experience or activity.

A team brainstorms a new concept. The discussion gets heated with team members raising their voices to support their own ideas. Each member then returns to their own desk to reflect on what has been raised and their behaviour. The team then meets again to discuss the concept with the benefit of the time they’ve spent reflecting.

Reflecting **on** action occurs at the end of an experience or activity and can be used to question our own thoughts and behaviours and to make decisions regarding our future behaviour.

A team member is struggling with a new program. You say, ‘give it to me; I'll do it for you' and spend the afternoon working on the team member's task. The employee's feedback to you is, ‘thank you for doing this for me, although I still don't know how to do the task for next time'.

You reflect on the incident the next day using Gibbs’ Reflective Cycle. You realise you were feeling frustrated with the employee’s lack of ability and annoyed at having to do extra work. You realise you should have been more empathetic and helped the team member learn the new skill and managed your emotions. You decide to increase the employee's belief in their own abilities by running a coaching session on the program.

### Values, behaviours and assumptions

It is important to understand how our values, behaviours and assumptions influence your approach to your work role.

When we recognise our differences, we can better understand why we sometimes have misunderstandings and disagreements at work.

#### Values

A person's values and practices link to society and culture and affect what leaders do and how they interact with others; they also affect the culture and practices of their organisations. Self-awareness is the ability to accurately recognise your own emotions, thoughts and values and how they influence behaviour. This isn't easy to gauge as people can find it difficult to look at themselves objectively.

Conflict can result from a difference of values; if our personal values conflict with another's, we can experience struggles over what is right or the correct course of action.

Your organisation may also have a values statement that represents the core priorities in the organisation’s culture.

Collaboration

### Activity 28: Organisational values

Think about how Gelos Enterprises’ values, outlined in their [Strategic Plan (pdf)](https://share.tafensw.edu.au/share/items/5f1cec7b-1d03-446a-85b7-edb42692c34e/0/?attachment.uuid=1bd395bc-ecab-4613-b80f-71e5a48fda9f), could impact on decision-making, problem-solving and service delivery. Make notes below and compare them with your classmates’.

#### Behaviours

The behaviours of team members impact the performance of the team. Some behaviours that facilitate effective workplace relationships and goal achievement include:

* communicating effectively
* encouraging others
* giving and receiving constructive feedback
* focusing on others without distraction
* being assertive.

Assertiveness is an expressive behaviour that respects others' dignity and humanity even when conveying something that might be unwelcome or controversial. Assertiveness is not aggressiveness. Being assertive requires empathy to be sensitive to others’ viewpoints and mitigate our own defensiveness.

#### Assumptions

At work, we often make assumptions about our colleagues’ and client’s needs, preferences, challenges and expectations.

It is important to check whether those assumptions are actually correct in order to avoid misunderstandings or create issues. For example, before a presentation to a diverse group you could:

* survey the audience about their current knowledge, opinions and preferred learning style
* test or practice the presentation with trusted colleagues who can give you feedback
* observe your audience during the presentation to assess their level of interest, understanding or confusion
* think about your own biases or preferences and evaluate how they are impacting your assumptions about the audience.

You must recognise that other people’s views of situations may be different from yours and understand that other people’s assumptions may be and should be different from yours.

Practice activity

### Activity 29: Reflect on values, behaviours and assumptions

Read the questions and select the correct actions.

1. A team member in a presentation is in a bad mood because of a personal issue.

|  |  |  |
| --- | --- | --- |
| # | Choices | Answer/s |
|  | Pretend it's not happening |  |
|  | Tell them to ‘snap out of it' |  |
|  | Show compassion and understanding |  |

1. Everyone is talking over each other in a meeting where you are evaluating a new technology.

|  |  |  |
| --- | --- | --- |
| # | Choices | Answer/s |
|  | Let the loudest person lead the discussion |  |
|  | Let each person speak without interruption |  |
|  | Cancel the meeting and let the manager make the decisions |  |

1. Your ICT section is undergoing change.

|  |  |  |
| --- | --- | --- |
| # | Choices | Answer/s |
|  | Change is resisted by the team |  |
|  | Rumours are spread about the negative effects of the change |  |
|  | Team members are consulted on the possible effects of the change on people before implementation |  |

### Self-reflection for future action

Every decision, piece of feedback or system implementation should be reviewed for its effectiveness. Part of this process also includes assessing your contribution or role and searching for opportunities for your own professional development. This process will help you to identify areas that you want to learn more about, or skills that you want to improve or develop.

An inward-looking approach, along with tools and a system for documenting your professional development, can also help with future evaluations at work. As part of an approach that aims to close the feedback loop, look for positive ways to incorporate feedback to improve your own communication strategies and performance.

Video

The Johari Window is an example of a tool that helps to identify which of your actions are successful, which ones you should stop and actions that you need to start doing.

Play the video [360 Feedback #4: The Johari Window](https://youtu.be/_aF-olRMuoQ), (YouTube 02:52 min), which outlines how to incorporate feedback to improve your own communication strategies using the concept of the Johari Window.

## Self-development and professional development

As part of your role, you will reflect on your own performance and seek opportunities to improve your own skills. You will identify your strengths and areas of improvement for self-development.

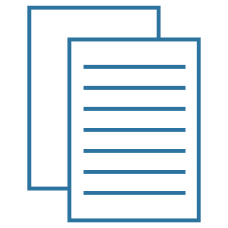
You can determine areas to develop from:

* self-reflection
* feedback from management
* feedback from colleagues and clients
* training needs analysis
* career goals.

### Areas of development

Technology is an area that’s constantly changing so it’s essential that you’re proactive about keeping your skills up to date. This will enable you to be more confident in using emerging technology. Upskilling will allow you to collaborate more effectively with your team and become a better leader. You will also become more versatile and secure as you acquire in-demand skills.

Working in IT means constantly learning so you should take advantage of any training opportunities offered by your workplace including courses, workshops and attending conferences. Of course, being proactive means taking responsibility for your own professional development – read widely from different sources, attend meetups and technology expos and arrange your own training when needed.

 Resources

Learn more about IT upskilling in the following resources:

* [PwC New world. New skills.](https://www.pwc.com/gx/en/issues/upskilling.html)
* [CompTIA 10 Skills You Didn't Know Could Land You an IT Job](https://www.comptia.org/career-change/exploring-it/skills-for-it).
* [4 Exciting New Trends in the Gartner Emerging Technologies Hype Cycle.](https://www.gartner.com/en/articles/what-s-new-in-the-2023-gartner-hype-cycle-for-emerging-technologies)

### Professional development plan

In your career you will have opportunities to improve your own skills and knowledge. This professional development is often documented in a learning and development plan. A learning and development plan may include the following:

* learning needs in priority order
* learning method and provider
* when the learning will occur
* where the learning will occur.

Informal learning refers to a spontaneous type of learning that is conducted outside of a conventional learning setting. Informal learning programs can be self-directed, unplanned and can occur at any time. Informal learning opportunities include:

* coaching
* additional job roles such as committee work and delegated tasks
* mentoring
* reading articles
* team activities
* watching videos.

Formal learning refers to a structured type of learning that is typically facilitated by an instructor and occurs through face-to-face sessions or through an online learning platform, such as a learning management system (LMS). Formal learning opportunities include:

* qualifications with training provider such as TAFE
* workplace training
* workshops
* industry conferences
* induction.

Document and record your professional development actions in a plan. The plan will include:

* Areas for professional development
* Formal and informal development methods
* Support required to implement the actions such as resources or experts.

**Example of professional development plan**

Table 14 – Example of a professional development plan

|  |  |  |
| --- | --- | --- |
| Area of development | Development method | Support required |
| Technology knowledge - AI Chatbots | Reading  Industry seminar | Mentor  Funding to attend seminar |
| Applying database of known problems | Coaching | ICT Support Manager |
| Writing emails | Gelos online training | Half hour professional development time |

Self-check

### How did you go?

You have completed the topic: ICT skills. Check the boxes for the tasks you feel confident you can complete.

I know and understand the requirements of communication practices in ICT.

I can communicate with management.

☐ I can plan for and make a presentation.

I can provide advice to the client and seek and record client feedback.

I can incorporate feedback and self-reflection to critically assess my own performance.

Assessment

As you have completed this topic, you should be ready to complete:

* Assessment event 1: Knowledge - Part 4 ICT professional skills
* Assessment event 3: Skills.

Before you begin you should review:

* Unit Assessment Guide
* Assessment Event 1 Knowledge
* Assessment Event 3 Skills.

If your assessments are online, go to Assessments in the top menu and access the files.

Topic 5: Working in ICT support

## Overview

This topic will provide you with a basic understanding of what is involved in the operation of a service desk. This includes having the knowledge required to record and prioritise client support activities, determine the required resources, solve client problems related to ICT or escalate as necessary.

In this topic you will learn to:

* explain the help desk or service desk structure and escalation procedures
* identify, record, prioritise and resolve a client ICT problem
* complete maintenance activities.

In Topic 4 you learned how to communicate with ICT clients. You will be able to apply your new knowledge and skills to providing client-based ICT support to end users in an office or working environment.

## The service or help desk

Many organisations provide a team that provides IT support. The team may be called a help desk or a service desk.

The way in which ICT problems are solved for clients, will be largely dependent on the way in which an organisation has been structured and the policies and procedures in place to deal with the problems. The structure provides a line of authority so that problems can be escalated according to the different levels, roles and responsibilities and accountabilities specified.

Gelos Enterprises’ [Organisational Chart (pdf)](https://share.tafensw.edu.au/share/items/b7f3345c-19b3-422a-8b3c-5eb1d2950cee/0/?attachment.uuid=3250f247-da8d-4f7e-9c53-7833f102fc49) illustrates the structure of the Information and Communications Technology (ICT) Department.

### Functions of service or help desks

The function of a service or help desk depends on the size of the organisation, the industry, hardware and software products in use and supported by the organisation, the number and scale of IT problems.

The functions of these desks include the following:

* providing a single point of contact for technology-related questions, problems and incidents
* managing IT incidents
* managing IT service requests
* providing support and service to clients in a timely way
* interacting with different stakeholders to clarify requirements, obtain information, gain approval for tasks and make service or change requests
* recording incidents, problems configuration changes done in systems, solutions and workarounds for problems
* communicating changes in systems, IT assets and releases.

### Types of service or help desks

The structure of a service or help desk can vary. Some examples include the following:

* **Local service desk**: Service desk co-located within or physically close to the users it serves.
* **Centralised service desk**: A single service desk formed from multiple service desks.
* **Virtual service desk**: Single service desk with team members spread across geographical or structural locations with the option of working from home, offshoring, or outsourcing.
* **24-hour service desk**: Combination of two or more geographically dispersed service desks to provide round-the-clock support to users.

### Service or help desk operations

The service or help desk operates in accordance with specific organisational procedures and systems such as those listed in the table below.

Table 15 Organisational procedures and systems

|  |  |  |
| --- | --- | --- |
| Policies | Procedures | Standards and guidelines |
| * ICT service level agreements (SLAs), including methods of contact, impact analysis and problem prioritisation * Warranties * Standard Operating Environment (SOE) * Security * IT equipment procurement * Work Health and Safety * Storage and disposal | * Software installation * Software upgrades * System configuration * Network guidelines * Security * Maintenance * Ticketing system | * Databases of known problems * Third party support and documentation * ICT sustainability including standards for the energy performance of laptops, desktops and monitors; requirements for reusable or recyclable components; repair and maintenance schedules. |

Resources

* Gelos Enterprises’ [Standard Operating Environment Policy (pdf)](https://share.tafensw.edu.au/share/items/5f1cec7b-1d03-446a-85b7-edb42692c34e/0/?attachment.uuid=6d3ef7dc-b21a-41f9-bb56-006f7e9551b4) describes the software and user environment.
* Gelos Enterprises’ [ICT Service Level Agreement (pdf)](https://share.tafensw.edu.au/share/items/5f1cec7b-1d03-446a-85b7-edb42692c34e/0/?attachment.uuid=fc1d5a4f-bca4-428a-bb01-84a1d4eb560a) outlines the policies, procedures, personnel and systems related to the service desk function.

## Service desk software

There are various types of software systems available in today’s market that are designed to manage service desk operations. It is important that organisations choose the correct IT service desk software product that adheres to industry best practice and meets the organisation’s requirements.

Service desk operators need to be trained on how to use the service desk software used in the organisation. They need to be familiar with the basic operations, follow the correct process and record information in the service desk system accurately and efficiently.

### Operating systems

Regardless of the size and complexity of the computer and the operating system, all operating systems perform basic functions that include the following:

* **File management:** This refers to the way that the operating system manipulates, stores, retrieves and saves data on storage devices.
* **Memory management:** An operating system is responsible for managing what is stored in random access memory (RAM) to allow multiple tasks to be completed.
* **Process management:** Processes are programs which are managed by the operating system. It allocates the central processing unit (CPU) to ensure processes are run efficiently.
* **Providing an interface:** this may be a graphical user interface (GUI), where interaction may be through clicking a mouse, or a command line interface (CLI), where instructions are typed in.
* **Print management:** Operating systems control the printing functions for a computer. All printing commands are sent to a printing queue and processed individually.

Resources

Gelos Enterprises’ [Standard Operating Environment Policy (pdf)](https://share.tafensw.edu.au/share/items/5f1cec7b-1d03-446a-85b7-edb42692c34e/0/?attachment.uuid=6d3ef7dc-b21a-41f9-bb56-006f7e9551b4) describes their software and user environment.

## Resolving client ICT problems

An incident management process is a set of pre-defined steps and procedures taken to resolve issues and support requests. The main objective is to ensure normal service operations are restored as soon as possible. The definition of normal service operations is usually defined in the service level agreement (SLA) between the support provider and client.

Service desk software supports the management of incidents and service requests using pre-established and best practice processes.

The stages for managing incidents are shown in the Incident Management Process diagram below.

Incident Management Process:
Identify
Record
Prioritise
Investigate
Resolve
Close
Monitor

Figure 4 – Incident management process © TAFE NSW 2023

Table 16 The stages for managing incidents

|  |  |
| --- | --- |
| Stages | Description |
| Identify | An incident may be reported by a client (end-user) or identified by the ICT department. When an incident happens, the first step is to identify the exact nature and extent of the problem. |
| Record | Information about the incident is then recorded in either an incident management system or by other means such as in a spreadsheet. Ensuring the incident is accurately recorded can assist with resolving the problem as quickly as possible. |
| Prioritise | What is the extent of the problem? How many users are affected? What impact does the incident have on business operations? These questions need to be asked when prioritising an incident. The priority will determine the appropriate action to be taken along with the number of employees or resources assigned to the incident. The SLA may include a priority matrix that ranks the issue’s the impact and urgency. |
| Investigate | What is the cause of the problem? Has this happened before and - if so - how it was resolved? This step of the process typically requires technical expertise. The incident could vary from being a known issue that can be quickly resolved by a low level of support to a critical priority for a more complex and challenging issue such as a security breach. Other issues may be escalated to an external vendor. |
| Resolve | Once the incident has been resolved, details of how it was fixed are recorded for future reference and the client is notified that the problem has been resolved. |
| Close | After the incident has been resolved, its status is changed to ‘closed’. This lets everyone know that the incident no longer needs attention. The details are stored for historical reporting and reference. |

In practice, the service or help desk client ICT procedure may use the following sequence of activities:

1. The incident is logged using a self-service portal that collects all of the relevant information at the time of the ticket’s creation.
2. The incident is categorised for forwarding to the appropriate person or section.
3. The incident is prioritised by the appropriate person or section based on an impact analysis.
4. The incident is assigned to the most appropriate technician according to the ticket’s priority.
5. A task is created and incident management system tracks progress and deadlines.
6. The incident is escalated where required in accordance with the Support Service Level Agreement.
7. The incident is resolved; the end user or client is notified; and the end user validates the resolution.
8. The incident status is updated in the ticketing system and closed, with data stored and used for post-incident analysis and feedback for continuous improvement.

### Prioritising problems

In order to prioritise client ICT problems:

* undertake an impact analysis of the problem
* determine the severity and risks
* prioritise the problem
* provide advice to the client on the way the problem will be resolved
* use organisational procedures to carry out the support process.

Critical issues would have a higher priority to ones which are classified as lower level. For example, a failed back up or disruption to business continuity would hold higher priority to that of a printer issue affecting only one user.

Resources

Gelos Enterprises’ [ICT Support Service Level Agreement Policy (pdf)](https://share.tafensw.edu.au/share/items/5f1cec7b-1d03-446a-85b7-edb42692c34e/0/?attachment.uuid=fc1d5a4f-bca4-428a-bb01-84a1d4eb560a) includes industry examples of:

* ICT support procedure
* ICT priority matrix
* Priorities and response times.

Practice activity

### Activity 30: Escalate issues

Read the question and select the correct answer.

1. Identify 3 situations when ICT issues should be escalated according to Clause 6 of Gelos Enterprises’ [ICT Support Service Level Agreement Policy (pdf)](https://share.tafensw.edu.au/share/items/5f1cec7b-1d03-446a-85b7-edb42692c34e/0/?attachment.uuid=fc1d5a4f-bca4-428a-bb01-84a1d4eb560a).

|  |  |  |
| --- | --- | --- |
| # | Choices | Answer/s |
|  | An issue will be escalated when it is affects a VIP or executive-level user |  |
|  | An issue will be escalated when the user can still work, and it can be resolved within 5 working days |  |
|  | An issue will be escalated when it cannot be resolved in a timely manner |  |
|  | An issue will be escalated when it requires vendor support |  |
|  | An issue will be escalated when it is a software upgrade request from an individual user |  |

### Database of known problems and resolution options

When a problem is reported, it is useful to check the service desk logs or the known problems database (or knowledge base) to see if similar problems have been reported in the past. There are strong reasons for this:

* Many organisations have large numbers of identical computer systems. Repeated instances of hardware failure in these systems can indicate a fault that will progressively occur in many more systems. The hardware vendor can be contacted to avoid large-scale disruption to operations.
* Repeated calls about problems that relate to usage (rather than hardware failure) can indicate the need for specific training. An example of this could be how to change a client password.
* Many organisations build up a knowledge base, where solutions to previous problems are detailed. Help desk team members can check the knowledge base before escalating the problem. This has the potential to greatly improve the time taken to resolve common problems and can be particularly useful for new help desk employees. In addition, this ensures that knowledge built up over time is not lost when individual help desk team members move on.
* Even if you’re employed by an organisation that does not have many employees, you should develop a system for recording support calls from clients. This will avoid issues where calls are not followed up and will also provide an audit trail showing the nature and complexity of your workload.

Practice activity

### Activity 31: Database of known problems

1. Access the [Microsoft Support](https://support.microsoft.com/en-GB) database of known problems.
2. Search for solutions to the problem of a slow computer that uses Windows 10.
3. Identify the solution options to fix the problem.

### Resolving client problems

Where possible, client problems should be resolved with minimum disruption to their work. The time taken to resolve the problem may mean that ICT functions that are important to the organisation will not be available if equipment is not operational. In this case, consider alternative options to allow the affected client to carry out their tasks.

Many organisations provide support remotely. Support workers can install software using the organisation’s network. Organise a suitable time for remote support to minimise disruption to the client.

For repairs to ICT equipment under warranty, an employee may have to be present to provide access. Ensure that someone will be available at this time to avoid delays and extra charges from vendors.

For training, follow organisation procedures to liaise with the managers of the affected business area managers and schedule a suitable time. This is particularly important when clients need to attend group training sessions, which will take clients away from their normal duties for extended periods of time.

Video

ICT support requires skills and knowledge for technical assistance and client communications. The following videos, courses and collections from LinkedIn Learning provide information on:

* working in a service desk
* interacting with a client
* common technical skills required for supporting an organisation.

You can watch all the videos and courses, or just the parts you need. Write a summary of points from each to help you with this topic.

* [What is an IT help desk?](https://www.linkedin.com/learning/it-help-desk-for-beginners/what-is-an-it-help-desk?u=57684225&auth=true) (LinkedIn Learning, 02:19 mins)
* [Working in a service desk](https://www.linkedin.com/learning/it-service-desk-careers-and-certifications-first-steps/working-in-a-service-desk?u=57684225&auth=true) (LinkedIn Learning, 01:50 mins)
* [Interacting with the client](https://www.linkedin.com/learning-login/share?account=57684225&forceAccount=true&redirect=https%3A%2F%2Fwww.linkedin.com%2Flearning%2Fcollections%2F6585029307616366592%3Ftrk%3Dshare_collection_url%26shareId%3DvEccw8qDQY%252B3fvVbHRjoLA%253D%253D&auth=true) (LinkedIn Learning, 44:08 mins)
* [Computer components and peripherals for IT technicians](https://www.linkedin.com/learning/computer-components-and-peripherals-for-it-technicians-3?u=57684225&auth=true) (LinkedIn Learning 02:19 mins)
* [Troubleshooting: Diagnosing errors, incidents and problems](https://www.linkedin.com/learning/it-service-desk-careers-and-certifications-first-steps/troubleshooting-diagnosing-errors-incidents-and-problems?u=57684225&auth=true) (LinkedIn Learning 06:03 mins)

LinkedIn videos will open in a new browser tab. Access the full video by logging in with your TAFE NSW username and password. Go to the transcript tab to access the video transcript. When you’re finished, close the tab and return to this unit. [LinkedIn Learning Support: Getting started](https://tafensw.libguides.com/linkedinlearningsupport/gettingstarted) (TAFE NSW Libraries) has more information.

### Referring problems

There are a number of reasons why a problem has to be referred. It could be that:

* the problem cannot be resolved by the first line of support due to limitations of their own role and responsibility
* the problem requires further analysis due to a lack of information
* the problem was initially solved but has reappeared again
* the problem requires immediate escalation due to the nature of the problem (such as it could be critical to business continuity)
* a technician is required for onsite support
* the problem cannot be dealt with internally and requires a third party
* the client has asked for it to be escalated.

Referring a problem could be due to the fact that the problem cannot be solved and so needs to be escalated to the next level of support.

Organisational procedures and processes can again support referring problems by providing a clearly structured framework based on specific criteria and factors to support decision making.

#### Third-party support

Some problems may be referred to a third party such as a vendor. For example, when an expensive item such as a Multi-Function Device is purchased, it is common practise to also have the vendor service the device by entering into a service level agreement with the third-party vendor or supplier.

Steps to escalate a problem to vendor support include:

1. identifying the vendor’s technical support contact details
2. obtaining partner identification details
3. obtaining specific details of the issue, software and hardware information and diagnostic tests
4. estimating the vendor’s expected response time based on the support service level agreement and communicate this to the internal client
5. raising a support ticket in the vendor’s service desk system
6. raising a support ticket in the internal service desk system to track the request.

At the end of the process, document the advice and support provided by the third party according to organisational procedures.

Resources

Clause 7 of Gelos Enterprises’ [ICT Support Service Level Agreement Policy (pdf)](https://share.tafensw.edu.au/share/items/5f1cec7b-1d03-446a-85b7-edb42692c34e/0/?attachment.uuid=fc1d5a4f-bca4-428a-bb01-84a1d4eb560a) describes links to vendors and the process of escalating problems to vendor support.

## Carry out maintenance

The aims of maintenance for of hardware, software and data are to:

* preserve ICT systems in optimal condition
* fix problems that happen
* upgrade the existing systems to minimise future risks to the organisation.

### Types of maintenance

Hardware and software maintenance falls into two broad categories:

* **preventative**: routine maintenance
* **corrective:** non-routine maintenance.

It’s not only the hardware in an organisation that needs to be maintained – software maintenance is also required. An organisation that has custom-built software needs programmers to maintain it.

Software maintenance also includes:

* **adaptive** maintenance to adapt the software in line with changes to organisational requirements (for example, to make it run on an Intranet)
* **perfective** maintenance to improve the performance of the software.

Apart from custom-built software, organisations need to maintain other software. There may be patches, version updates, driver updates, etc. to be installed. Upgrading packaged software across an organisation to standardise software versions is a good way of helping to reduce the level of support and maintenance required.

Maintenance of a hard disk is a form of software and data maintenance. A variety of tools are available for ‘cleaning up’ a disk - removing unwanted programs and data and backing up data. Protecting the system from viruses and malware is also part of this sort of maintenance.

#### Preventative maintenance

Specific devices require different preventative maintenance procedures. However, there are a few broad areas that can be considered that require preventative maintenance practices. These include:

* protection of equipment due to changes in electrical supply
* protection from environmental conditions
* protection of data using backups
* protection of data from threats such as viruses, malware and hackers through the use of both hardware and software security measures
* keeping software updated through service packs, patches, driver and firmware upgrades
* checking integrity and performance by using diagnostic tools – routine running of any built-in diagnostics and/or checking for display of maintenance messages generated by the device.

#### Corrective or reactive maintenance

Corrective maintenance refers to actions taken to fix problems after they have happened. To continue with the car example, when you get a flat tyre and have to replace it, this is a simple example of corrective maintenance. You can probably think of many ICT examples, such as replacing a broken cable or fixing software bugs.

### Determining maintenance requirements

From the point of view of an ICT support person, how do you determine exactly what maintenance should be done and how often it should be done? What information should you refer to?

To start with, your organisation will have specific procedures that deal with maintenance and how it is scheduled. These procedures will be either because of - or in conjunction with - the following:

* **Organisational policies**: Procedure may be in place because of your organisation’s policy on the management of risk and internal service delivery standards.
* **Warranties and maintenance contracts for equipment**: These will often involve an agreed level of support for the equipment, also called a service level agreement (SLA).
* **Manufacturer and vendor instructions**: Both equipment and software are provided with documentation regarding their handling and maintenance requirements and training may be available.

The maintenance procedures in an organisation will be determined by several factors, including:

* how critical the ICT components and/or software are
* cost constraints
* the risk to business continuity
* pre-existing commitments
* expectations of service by the organisation’s business units.

### Obtaining components for maintenance

ICT hardware and software are often expensive items. Organisations will usually have policies and procedures in place that outline what is required when obtaining components. This may include considerations such as:

* getting initial approval to obtain quotes
* selection criteria of equipment, such as the product requirements (for example, minimum processor speed or monitor size), warranty, training requirements, price and preferred vendors
* purchasing procedures
* budgets and approvals to purchase.

### Performing maintenance

Many different forms of maintenance can be performed. The following videos and resources outline some of these.

Video

The following videos from LinkedIn Learning explain how to configure a Windows backup and update:

* [Configuring Windows Backup](https://www.linkedin.com/learning/learning-pc-maintenance-and-performance-2/configuring-windows-backup?u=57684225&auth=true) (LinkedIn Learning 03:43 mins)
* [Configuring Windows Update](https://www.linkedin.com/learning/learning-pc-maintenance-and-performance-2/configuring-windows-update?u=57684225&auth=true) (LinkedIn Learning 02:19 mins)

The following videos from LinkedIn Learning to learn how to configure Windows startup and shutdown issues:

* [Running the memory diagnostic](https://www.linkedin.com/learning/troubleshooting-common-pc-issues-for-users-2/running-the-memory-diagnostic?u=57684225&auth=true) (LinkedIn Learning 02:02 mins)
* [Working in the Disk Management Console](https://www.linkedin.com/learning/troubleshooting-common-pc-issues-for-users-2/working-in-the-disk-management-console?u=57684225&auth=true) (LinkedIn Learning 04:05 mins).

LinkedIn videos will open in a new browser tab. Access the full video by logging in with your TAFE NSW username and password. Go to the transcript tab to access the video transcript. When you’re finished, close the tab and return to this unit. [LinkedIn Learning Support: Getting started](https://tafensw.libguides.com/linkedinlearningsupport/gettingstarted) (TAFE NSW Libraries) has more information.

Resources

The following articles explain more about diagnostic tools for Windows, including third-party tools:

* [13 Windows Diagnostics Tools to Check Your PC’s Health](https://www.makeuseof.com/tag/13-windows-diagnostics-tools-check-pcs-health/)
* [How to use the Windows 10 System Diagnostic Report to gather troubleshooting info on the fly](https://www.techrepublic.com/article/how-to-use-the-windows-10-system-diagnostic-report-to-gather-troubleshooting-info-on-the-fly/)

Practice activity

### Activity 32: Memory diagnostic tool

1. Check your computer for memory problems using the diagnostic tool such as the Windows Memory Diagnostic Tool.
2. Determine the steps to optimise the hard drive on your device.
3. Discuss your findings with your colleagues.

### Storage and handling of used components

Used components may need to be either disposed of or stored for future use. When disposing of e-waste, it's important that organisational and environmental guidelines are followed.

#### Manufacturer’s requirements

When handling computer equipment, you need to follow the manufacturer’s guidelines on handling and storage. The most obvious place to find that information is the User Guides/Manuals that accompany the product.

One of the best ways to locate the current information is the manufacturer’s website. Apart from documentation, you can also access online user groups.

#### Moving computer hardware

Care should be taken when moving computer hardware due to the sensitive nature of many components, particularly hard disks. When moving computers, always ensure that they are shut down. Give the hard disk drive platters several seconds to stop spinning before moving the device to prevent a disk head crash.

#### Storing equipment

You will find that manufacturers will almost invariably require that equipment should be stored in the same packaging in which it was delivered. While this is valid in principle, often it can be impractical. Empty packaging can consume significant storage space, which may not seem justifiable on a cost basis. However, if you don’t have on-site support to return equipment to the supplier, you’ll need enough to cover the basics. For example, if you have five printers from one manufacturer, you may choose to keep the packaging of one printer.

When storing equipment, you must consider the factors of temperature, humidity, dust and so on. If the equipment is not in use, then such factors as temperature are less of an issue than if the equipment were in current use.

If unused or stored equipment is packaged like its original state, this will usually be good enough. Any partially used consumables like ink or toner cartridges shouldn’t be stored but disposed of in the manner prescribed by the manufacturer. While this may seem wasteful, after a short time it’s unlikely that the consumables will be in a useable state.

#### Disposing of equipment

Electronic waste, or e-waste, can and should be recycled wherever possible to avoid adding to landfill. In addition, ICT components that include data should be sanitised before disposal to ensure that any personally identifiable information is removed.

Resources

Read through the following to learn more about disposing of e-waste:

* [E-waste in the workplace](https://www.sustainability.vic.gov.au/recycling-and-reducing-waste/in-a-business/recycle-and-dispose/e-waste-in-the-workplace) (Sustainability Victoria)
* Gelos Enterprises [ICT Disposal and Storage Procedure (pdf)](https://share.tafensw.edu.au/share/items/5f1cec7b-1d03-446a-85b7-edb42692c34e/0/?attachment.uuid=02f82864-f184-410d-851c-b26d5a12e6b8)

Practice activity

### Activity 33: Hardware storage guidelines

Review Clause 3.1 of Gelos Enterprises’ [ICT Disposal and Storage Procedure (pdf)](https://share.tafensw.edu.au/share/items/5f1cec7b-1d03-446a-85b7-edb42692c34e/0/?attachment.uuid=02f82864-f184-410d-851c-b26d5a12e6b8) then answer the following question.

1. Select **3** guidelines for storing hardware components.

|  |  |  |
| --- | --- | --- |
| # | Choices | Answer/s |
|  | Hardware components waiting to be repaired should be well marked to show they need repair. |  |
|  | Hardware components waiting to be repaired should be stored in an easily accessible location separate from other components. |  |
|  | Hardware components that are being stored should be taken out of the packaging and placed on an open shelf. |  |
|  | Hardware components that are being stored should be wrapped to protect them from dust or damage. |  |

### Systems maintenance logs

A systems maintenance log, at its most basic, is a document that identifies each maintenance task that has been completed on a particular system. Many of these maintenance tasks are a direct result of a problem being identified on the system. Other tasks, however, may simply be a part of a preventative maintenance schedule or may involve system modifications.

#### Types of systems maintenance logs

Some systems maintenance logs may be **corrective** in nature. This means that they detail the maintenance procedures used to solve a particular problem or incident. Other systems maintenance logs may be **preventative** in nature. This means that they contain a list of maintenance tasks completed as part of a preventative maintenance program. Many systems maintenance logs will contain elements of both of these types of logs.

While some computer systems may require individual maintenance logs, others may share a common log with other maintained computer systems in an organisation.

The media in which logs are stored may also vary. Some logs may be paper-based, while others may be in electronic form.

#### What a systems maintenance log includes

A systems maintenance log contains information that relates to maintenance tasks performed on a system. Many maintenance tasks are performed in response to a specific situation or problem. The maintenance task that is carried out on a system will also involve a procedure that was followed in solving the problem and may require specific resources.

The required format of a systems maintenance log may be based on such things as:

* the design components required to meet the internal business document standards
* proof that authority to perform maintenance procedures was given
* the need to record the time taken to perform the task
* proof that the procedures used in maintenance tasks and their results were referred to appropriate personnel
* the contents of a support level agreement which may specify the level of detail required in maintenance log documentation
* the need to collate and analyse information from logs of similar devices
* the requirement to record that specific maintenance tasks were performed on devices according to a maintenance schedule
* confirmation that requirements have been met.

Practice activity

### Activity 34: Maintenance log

Practice using a maintenance log by downloading Gelos Enterprises’ [ICT Maintenance Log Template (dotx)](https://share.tafensw.edu.au/share/items/02285ff1-cfb2-4af4-b402-fdc23bf4bf11/0/?attachment.uuid=1a228f00-e0f7-4087-aeea-b2114cabafe1) and recording the memory diagnostic maintenance task you performed in Activity 30. Compare your findings with those of your colleagues.

Self-check

### How did you go?

You have completed the topic: Working in ICT support. Check the boxes for the tasks you feel confident you can complete. I know how to:

explain the help desk or service desk structure and escalation procedures

identify, record, prioritise and resolve a client ICT problem

complete maintenance activities.

Assessment

As you have completed this topic, you should be ready to complete:

* Assessment event 1: Knowledge - Part 5 Working in ICT support
* Assessment event 4: Skills.

Before you begin you should review:

* Unit Assessment Guide
* Assessment event 1: Knowledge
* Assessment event 4: Skills.

If your assessments are online, go to Assessments in the top menu and access the files.

# Answers and feedback

Practice activity: Page:

Activity 1: Purpose of policies and procedures 11

Question:

Select 3 examples of organisational objectives related to emerging technologies and practices.

Answer:

A: ICT systems and changes should support Gelos in its core business

B: Gelos will improve operational efficiency through ICT systems

C: All ICT systems and technologies must be secure

Practice activity: Page:

Activity 2: Purpose of policies and procedures 14

Question: 1

Policies act as a guideline for all decisions made in an organisation and ensure operational tasks meet the legislative requirements relevant to your industry

Answer:

True

Question: 2

Procedures explain how to perform day-to-day tasks in line with the organisation’s policies

Answer:

True

Question: 3

Policies and procedures are unrelated to legal compliance

Answer:

False

Practice activity: Page:

Activity 3: Multiple choice 18

Question:

When must an organisation report a data breach?

Answer:

A: When there is unauthorised access to or unauthorised disclosure of personal information, or a loss of personal data, that an organisation holds

Practice activity: Page:

Activity 5: Multiple choice 21

Question: 1

Select 3 ways an organisation can show commitment to environmental sustainability in ICT.

Answer:

A: Set objectives and targets to reduce the environmental impact of ICT activities

B: Use critical thinking approaches to understand the work activities that impact the environment, such as the use of resources, the impact of emissions and environmental hazards

C: Develop procedures for the maintenance, storage and disposal of ICT components

Practice activity: Page:

Activity 6: What kind of critical thinker are you? 35

Question: 1

Critical thinking is being able to think clearly and rationally, making logical connections between ideas

Answer:

True

Question: 2

Critical thinking requires you to be critical of another person's work

Answer:

False

Question: 3

Critical thinking can be developed through actions that help you to reconsider your first judgements

Answer:

True

Question: 4

An excellent critical thinker always has solutions to problems instantly

Answer:

False

Question: 5

A key concept in the critical thinking process is not jumping too quickly to a solution

Answer:

True

Question: 6

Asking questions is a crucial technique in the critical thinking process

Answer:

True

Practice activity: Page:

Activity 7: Ask problems as questions 32

Question: 1

Problem: The computer won't start.

Feedback:

You might have written your question in different ways.

When you wrote your question, did you think about who you were asking them to? Do they know a lot about computers or not much at all?

Question:

Problem: The client has not replied to my message.

Feedback:

You might have written your question in different ways.

When you wrote the question, were they open to elicit information, or did they assume a reason for the lack of a reply?

Practice activity: Page:

Activity 8: Multiple choice 35

Question: 1

Select 3 steps to evaluate arguments.

Answer:

A: Identify the assumptions that underpin an argument or opinion

C: Determine whether an argument is logically valid

E: Check to see if there is any missing information that would change a conclusion

Practice activity: Page:

Activity 10: Developing decision-making criteria 38

Question: 1

What is the budget for my new car?

Feedback:

Answers will vary

Determine the maximum amount you're willing to spend, considering not just the purchase price but also additional costs like taxes, registration, insurance and potential financing interest.

Question: 2

What journeys will I mainly use my car for?

Feedback:

Answers will vary

Consider your typical usage patterns, such as commuting, family transportation, or occasional road trips. This will help determine the type and size of the vehicle that suits your lifestyle.

Question: 3

What car features are essential for me?

Feedback:

Answers will vary

Identify must-have features such as safety technology, fuel efficiency, cargo space, entertainment options, or specific performance capabilities.

Question: 4

How much space do I need?

Feedback:

Answers will vary

Consider your space requirements for passengers and cargo. If you have a family or frequently travel with others, ample interior space may be crucial.

Question: 5

Do I prefer a new or a used car?

Feedback:

Answers will vary

Evaluate whether a brand-new car or a used one better fits your budget and preferences. Used cars often offer good value but may have more wear and tear.

Practice activity: Page:

Activity 13: Brainstorming 41

Question:

How do I get the team to return to working from the office?

Feedback:

Did brainstorming lead to many options?

Were the group members able to find creative approaches or ideas?

Did quieter group members feel comfortable sharing ideas?

Did brainstorming lead to any feasible solutions

Practice activity: Page:

Activity 19: Multiple choice 54

Question:

Which statement represents a clear research objective?

Answer:

B: Identify and evaluate 3 options for cyber security training at XYZ company

Practice activity: Page:

Activity 22: Multiple choice 72

Question:

Select 3 reasons to plan your own work tasks as an ICT support professional.

Answer:

B: Good planning enables you to complete your job tasks to the standards expected within the required timeframe

D: Good planning ensures that the most important and urgent tasks are completed first and that time-sensitive tasks are completed as a priority

E: Good planning improves job satisfaction as you cross off the items on your To Do list

Practice activity: Page:

Activity 23: Multiple choice 74

Question: 1

What does the acronym SMART stand for?

Answer:

B: Specific, Measurable, Achievable, Realistic, Timely/timebound

Question: 2

Select the correct example of a SMART goal.

Answer:

A: We will create an AI-based Application Tracker by the end of this quarter, after we shift Talent Management to a digital platform.

Practice activity: Page:

Activity 24: Sequencing 78

Question:

Sequence the steps from 1 to 9 for planning a communication campaign promoting the use of digital collaboration tools at work.

Answer:

|  |  |
| --- | --- |
| Order | Steps |
| 9 | Upload digital campaign materials to your organisation’s channels |
| 5 | Design campaign graphics |
| 7 | Make necessary changes from Branding/Marketing review |
| 1 | Brainstorm campaign concept |
| 6 | Have the Marketing department review produced materials |
| 2 | Shortlist campaign ideas |
| 4 | Write the copy |
| 8 | Produce campaign |
| 3 | Storyboard campaign ideas |

Practice activity: Page:

Activity 25: Multiple choice 82

Question:1

Select 3 applications of a code of conduct to workplace interactions and communications.

Answer:

A: The code of conduct explains the responsibilities of employees towards each other

C: The code of conduct provides guidance on protocols for personal and professional conduct

D: The code of conduct sets standards of behaviour that ensure the organisation meets its legal and ethical responsibilities

Practice activity: Page:

Activity 26: Multiple choice 86

Question:

Select 3 non-verbal behaviours to show you are listening to feedback effectively.

Answer:

B: Direct and regular eye contact

D: Friendly and courteous facial expression

F: Upright and relaxed posture

Practice activity: Page:

Activity 27: Select communication methods 100

Question: 1

Match the following communication activities with their respective communication methods

Answer:

|  |  |  |
| --- | --- | --- |
| Communication activities | Answer | Communication methods |
| 1. Respond to an urgent request for information | B | 1. Email |
| 1. Reporting on a project to the General Manager | D | 1. Telephone |
| 1. Activity update for a colleague | A | 1. Face to face meeting |
| 1. Discussion about a project with a new external client | C | 1. Formal report |

Practice activity: Page:

Activity 29: Reflect on values, behaviours and assumptions 111

Question: 1

A team member in a presentation is in a bad mood because of a personal issue

Answer:

C: Show compassion and understanding

Feedback:

Being aware and responding to other people’s emotional states shows an understanding that all people experience strong emotions and, says that a person’s feeling matter.

Question: 2

Everyone is talking over each other in a meeting where you are evaluating a new technology.

Answer:

B: Let each person speak without interruption

Feedback:

When people are allowed to speak and others listen, without constant interruptions, it’s a good sign of emotional intelligence in action. It shows mutual respect between team members and is more likely to lead to a constructive conclusion in meetings.

Question: 3

Your ICT section is undergoing change.

Answer:

C: Team members are consulted on the possible effects of the change on people before implementation

Feedback:

Change is inevitable however if new initiatives are regularly introduced successfully, it's a sign that emotional intelligence has contributed to the planning, introduction and response to the changes

Practice activity: Page:

Activity 30: Multiple choice 124

Question: 1

Identify 3 situations when ICT issues should be escalated according to Clause 6 of Gelos Enterprises’ [ICT Support Service Level Agreement Policy (pdf)](https://share.tafensw.edu.au/share/items/5f1cec7b-1d03-446a-85b7-edb42692c34e/0/?attachment.uuid=fc1d5a4f-bca4-428a-bb01-84a1d4eb560a).

Answer:

A: An issue will be escalated when it is affects a VIP or executive-level user

C: An issue will be escalated when it cannot be resolved in a timely manner

D: An issue will be escalated when it requires vendor support

Practice activity: Page:

Activity 31: Database of known problems 126

Question:

Access the [Microsoft Support](https://support.microsoft.com/en-GB) database of known problems.

Search for solutions to the problem of a: slow computer that uses Windows 10.

Identify the solution options to fix the problem.

Feedback:

Did you find the information on tasks to improve the performance of a PC in Windows 10?

Reflect on the benefits of using a database of known problems in a service desk job role.

Practice activity: Page:

Activity 32: Memory diagnostic tool 132

Question: 1

Check your computer for memory problems using the diagnostic tool such as the Windows Memory Diagnostic Tool.

Feedback:

Memory problems can cause your computer to lose information or stop working. Think about the steps you went through and how you would explain them as clear instructions to a client on the phone, in an email or on through an online ticketing system.

Question: 2

Determine the steps to optimise the hard drive on your device.

Feedback:

You can optimise the drives to help a computer run more efficiently or analyse them to find out if they need to be optimised.

Are you drives being analysed on a scheduled cadence such as weekly? Think about how you would explain the benefits of regular maintenance to a client.

Practice activity: Page:

Activity 33: Multiple choice 135

Question: 1

Select 3 guidelines for storing hardware components.

Answer:

A: Hardware components waiting to be repaired should be well marked to show they need repair

B: Hardware components waiting to be repaired should be stored in an easily accessible location separate from other components

D: Hardware components that are being stored should be wrapped to protect them from dust or damage

Practice activity: Page:

Activity 34: Maintenance log 137

Question:

Practice using a Maintenance log by downloading Gelos Enterprises’ [ICT Maintenance Log Template (dotx)](https://share.tafensw.edu.au/share/items/02285ff1-cfb2-4af4-b402-fdc23bf4bf11/0/?attachment.uuid=1a228f00-e0f7-4087-aeea-b2114cabafe1) and recording the memory diagnostic maintenance task you performed in Activity 30.

Feedback:

Were you able to find the information required to complete the log in full including the description of the machine, its location, the date of the maintenance, the procedure you initiated and how long the task took to complete.

# Image attributions

Table 17 – Image attributions

|  |  |  |  |
| --- | --- | --- | --- |
| Title | Creator | Licence | Modified/By |
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# Appendix: Links

Below is a list of all URLs linked in this workbook.

Table 18 – URLs

|  |  |
| --- | --- |
| Link title | URL |
| ICT Governance Policy | https://share.tafensw.edu.au/share/items/5f1cec7b-1d03-446a-85b7-edb42692c34e/0/?attachment.uuid=7041aeea-1a17-4f66-839d-f96f5c24d143 |
| Gelos Enterprises | https://share.tafensw.edu.au/share/items/d0b458dc-3922-409d-b1fe-9a2f785f4a38/0/?attachment.uuid=5f1677bf-8296-4137-ae33-8b9e30bad1ab |
| Gelos Enterprises intranet | https://share.tafensw.edu.au/share/items/d0b458dc-3922-409d-b1fe-9a2f785f4a38/0/?attachment.uuid=aa9bb643-d101-45be-9b0f-533c4cc33ba1 |
| Why you need Workplace Policies & Procedures | https://www.youtube.com/watch?v=rYQZskPrBWQ |
| copyright basics | https://www.ag.gov.au/rights-and-protections/copyright/copyright-basics |
| 5 common copyright myths | https://www.youtube.com/watch?v=PgZdVD1JGGE |
| APP | https://www.oaic.gov.au/privacy/privacy-guidance-for-organisations-and-government-agencies/preventing-preparing-for-and-responding-to-data-breaches/data-breach-preparation-and-response/part-4-notifiable-data-breach-ndb-scheme#entities-covered-by-the-ndb-scheme |
| Australian Privacy Principles – a summary for APP entities | https://www.oaic.gov.au/\_\_data/assets/pdf\_file/0020/1289/app-quick-reference-tool.pdf |
| Gelos Enterprises Data Protection Policy | https://share.tafensw.edu.au/share/items/5f1cec7b-1d03-446a-85b7-edb42692c34e/0/?attachment.uuid=825c6959-8447-4007-8839-2d9b69dbde74 |
| SafeWork NSW | https://www.safework.nsw.gov.au/legal-obligations |
| Charles Sturt University | https://www.csu.edu.au/sustainability/life-framework/facilities-and-operations/sustainable-ict-what-you-can-do |
| What’s the difference between usability and accessibility | https://www.youtube.com/watch?v=Nn7G4Wnn5XM&t=43s |
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