PROBLEM-SOLVING STRATEGIES

UNIT STANDARDS

14927:	Apply problem solving strategies
14963:	Investigate the use of computer technology in an organisation
14920:	Participate in groups and/or teams to recommend solutions to problems
14919:	Resolve computer user's problems
14938:	Resolve technical computer problems

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PSSTR11V1

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MODULE UNIT STANDARD ALIGNMENT

This module is aligned to the following unit standards:

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14920	Participate in groups and/or teams to recommend solutions to problems	4	3
14919	Resolve computer user`s problems	4	5
14938	Resolve technical computer problems	4	5

PURPOSE, OUTCOMES AND ASSESSMENT CRITERIA

14927 – Apply problem solving strategies

Purpose: This unit standard is intended:

- to provide fundamental knowledge of the areas covered
- for those working in, or entering the workplace in the area of Business and Organisational Communication
- as additional knowledge for those wanting to understand the areas covered

People credited with this unit standard are able to:

- Define and analyse the problem
- Evaluate solutions
- Implement the solution

The performance of all elements is to a standard that allows for further learning in this area.

Outcome 1

- Define and analyse the problem.

Assessment Criteria

- The definition ensures that the problem is examined and identified in terms of problem type, problem parameters, and possible causes.
- The definition ensures that facts are collected to meet the problem requirements.
- The analysis ensures that problem components are identified to determine possible courses of action.
- The analysis ensures that the problem is analysed for cross-cultural implications.

Outcome 2

- Evaluate solutions.

Assessment Criteria

- The evaluation identifies possible solutions to the problem by using a range of problem solving techniques.
- The evaluation establishes criteria for evaluating solutions to match the type of problem.
- Possible solutions are evaluated against established criteria.
- The evaluation ensures that solutions are selected to meet established criteria and problem requirements.

Outcome 3

- Implement the solution.

Assessment Criteria

- The implementation ensures that solutions are trialed and/ or monitored for effectiveness of problem solution.

- The implementation ensures that solutions are reviewed and modified, and practices are standardised where required.
- The implementation ensures that stakeholders are consulted during implementation.

14963 – Investigate the use of computer technology in an organisation.

Purpose: This unit standard is intended:

- To provide knowledge at a proficient level, of the areas covered.
- For those working in, or entering the workplace in the area of Information Systems & Technology Management.
- As additional knowledge for those wanting to understand the areas covered.

People credited with this unit standard are able to:

- Plan an investigation of the use of computer technology in an organisation.
- Conduct an investigation of the use of computer technology in an organisation.
- Describe the use of computer technology in the chosen organisation.
- Evaluate the use of computer technology in the chosen organisation.
- Present the results of the investigation of the use of computer technology in the chosen organisation.

The performance of all elements is to a standard that allows for further learning in this area.

Outcome 1

- Plan an investigation of the use of computer technology in an organisation.

Assessment Criteria

- The plan identifies the scope and objectives of the investigation.
- The plan identifies an organisation that has agreed to be investigated.
- The plan identifies requirements of the investigation from the organisation.
- The plan is accepted by the primary contact person from the organisation.
- The plan specifies milestones and reporting requirements.

Outcome 2

- Conduct an investigation of the use of computer technology in an organisation.

Assessment Criteria

- The investigation proceeds according to the investigation plan.
- The investigation justifies any modifications to the plan.
- The investigation indicates progress at planned intervals.

Outcome 3

- Describe the use of computer technology in the chosen organisation.

Assessment Criteria

- The description identifies the planning procedures used for implementation of computer technology.
- The description identifies the computer systems in use within the organisation.
- The description outlines the personnel involved in the provision of computer systems.

Outcome 4

- Evaluate the use of computer technology in the chosen organisation.

Assessment Criteria

- The evaluation identifies the strengths of the computer systems in use.
- The evaluation identifies areas of future developments based on weakness and anticipated future needs.

Outcome 5

- Present results of an investigation of the use of computer technology in the chosen organisation.

Assessment Criteria

- The presentation meets the objectives of the investigation plan.
- The results of the investigation are reviewed for accuracy with the organisation.
- The presentation communicates the results of the investigation to peers.

14920 - Participate in groups and/or teams to recommend solutions to problems

Purpose: This unit standard is intended:

- To provide fundamental knowledge of the areas covered?
- For those working in, or entering the workplace in the area of Business and Organisational Communication ?
- As additional knowledge for those wanting to understand the areas covered

People credited with this unit standard are able to:?

- Contribute to team problem solving?
- Contribute to group and/ or team function

The performance of all elements is to a standard that allows for further learning in this area.

Outcome 1

- Contribute to team problem solving.

Assessment Criteria

- Contributions made are relevant to, and focussed on, subject matter and group/ team objectives.
- Contributions to problem solving are made in a range of decision making processes and contexts.
- Contributions to decision making are made on the basis of available data and are made objectively.
- Contribution utilises verbal and non-verbal feedback to show interest and opinion, and to encourage contributions from others.

Outcome 2

- Contribute to group and/ or team functions.

Assessment Criteria

- Contribution supports the group in terms of complying with group/ team decisions, sharing responsibility for group/ team problems, and sharing credit for group/ team successes.
- Contribution overcomes obstacles and ensures that the team function is consistent with team objectives and agreed rules for team member behaviour.
- Contributions made to the team's selection and use of techniques match the task requirements.
- Contribution monitors own behaviour in order to accommodate team dynamics.
- Contribution ensures that delegated duties are carried out to team requirements.
- Contribution ensures that allocated tasks are carried out in a manner that reinforces the work of the team and contributes to the achievement of team objectives.
- Contribution presents outcomes and findings from allocated tasks in a manner that maximises their value to the team.

14919 - Resolve computer user`s problems

Purpose: This unit standard is intended:

- To provide a fundamental knowledge of the areas covered.

- For those working in, or entering the workplace in the area of Systems Support.

People credited with this unit standard are able to:

- Receive computer user`s problems.
- Investigate computer users problems.
- Implement solutions to computer user`s problems.
- Close resolved computer user`s problems.
- Forward unresolved computer user`s problems to appropriate area.

The performance of all elements is to a standard that allows for further learning in this area.

Outcome 1

- Receive computer user's problems.

Assessment Criteria

- The request received identifies the users and their terms of support so that the response procedure can be determined.
- The request received records sufficient information about the problem to begin an investigation.
- The contact with users of the request received employs personal communication techniques which allows users to feel that the problem will be resolved to their satisfaction.
- The request received is assigned a timeframe and priority to the problem according to organisation standards and the terms of the support agreement for each user.

Outcome 2

- Investigate computer user's problems.

Assessment Criteria

- The investigation uses information sources to identify known problems.
- The investigation use industry recommended procedures to identify the cause of the problem.
- The investigation records symptoms of unresolved identified problems to be forwarded to technical support services to resolve.
- The investigation advises users of progress according to the terms of their support agreement.
- The investigation advises third parties of progress according to the terms of the user's support agreement.

Outcome 3

- Implement solutions to computer user's problems.

Assessment Criteria

- The implementation ensures that the user's system is returned as soon as possible.
- The implementation uses reference data sources to identify known solutions to known problems.
- The implementation designs solutions for any new problems identified.
- The implementation records the action taken in sufficient detail to allow it to be repeated.
- The implementation monitors progress of a solution so that users may be advised of progress according to the terms of their support agreement.

Outcome 4

- Close resolved computer user's problems.

Assessment Criteria

- The closure presents a report on the resolution of each problem to the user, so that they may judge that the problem has been satisfactorily resolved.
- The closure records resolution of the problem according to organisation standards and procedures.

Outcome 5

- Forward unresolved computer user's problems to appropriate area.

Assessment Criteria

- The extension of the problem is reported to the user involved, according to the terms of their support agreement.
- The extension advises third parties of progress according to the terms of the user's support agreement.
- The extension records additional information on unresolved identified problems to be forwarded to appropriate area to resolve.

14938 – Resolve technical computer problems

Purpose: This unit standard is intended:

- To provide a fundamental knowledge of the areas covered
- For those working in, or entering the workplace in the area of Systems Support

People credited with this unit standard are able to:

- Troubleshoot technical computer problems, identifying possible course of action
- Provide solutions to technical computer problems, including time estimates, cost and resources needed.
- Maintain information logs of problems identified

The performance of all elements is to a standard that allows for further learning in this area.

Outcome 1

- Troubleshoot technical computer problems, identifying possible course of action.

Assessment Criteria

- The troubleshooting verifies the reported symptoms and identifies any further symptoms.
- The troubleshooting uses information sources to identify known problems.
- The troubleshooting use industry recommended procedures to identify the cause of the problem.
- The troubleshooting results in undiagnosed problems to be forwarded to technical expert support staff for assistance.

Outcome 2

- Provide solutions to technical computer problems, including time estimates, cost and resources.

Assessment Criteria

- The provision estimates the costs and benefits of the solution to allow a judgement to be made about implementing the solution.
- The provision describes the solution so that a judgement can be made about the feasibility and effectiveness of the solution.
- The provision ensures that a plan for implementing the solution estimates the time and resources required, and specifies milestones.

Outcome 3

- Maintain information logs of problems identified.

Assessment Criteria

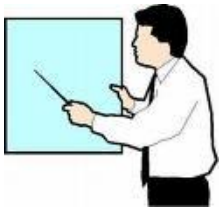
- The information logs are maintained in a recording system for problems and solutions.
- The information log maintenance identifies sources for occurrence volumes for problems and solution for future reference of technical support for the area of expertise.
- The information log maintenance identifies sources for new information and trends for future reference of technical support in the area of expertise.
- The information logs maintained show an understanding of the need for information logs as sources of information for future reference of technical support for the area of expertise.

ALIGNMENT MATRIX

The above outcomes can be found in the following learning units:

Unit Std Number and Name	Specific Outcomes	Learning Unit Number and Name
14927: Apply problem solving strategies	Specific Outcome 1 Specific Outcome 2 Specific Outcome 3	Learning Unit 1: Apply problem solving strategies
14963: Investigate the use of computer technology in an organisation	Specific Outcome 1 Specific Outcome 2 Specific Outcome 3 Specific Outcome 4 Specific Outcome 5	Learning Unit 2: Investigate the use of computer technology in an organisation
14920: Participate in groups and/or teams to recommend solutions to problems	Specific Outcome 1 Specific Outcome 2	Learning Unit 3: Groups and/or teams problem solving
14919: Resolve computer user's problems	Specific Outcome 1 Specific Outcome 2 Specific Outcome 3 Specific Outcome 4 Specific Outcome 5	Learning Unit 4: Resolve computer user's problems
14938: Resolve technical computer problems	Specific Outcome 1 Specific Outcome 2 Specific Outcome 3	Learning Unit 5: Resolve technical computer problems

Instruction to Facilitator:



Please make sure that the learners have completed the dates of the Formative- and Summative Assessment in their PoE Workbooks, in the place provided, as shown below.

FORMATIVE ASSESSMENT COMPLETION DATE

All Formative Activities needs to be completed by _____ (date)

Learner Signature: _____Date: _____

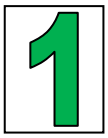
SUMMATIVE ASSESSMENT DATE

Date: _____ Time: _____Venue:_____

Learner Signature: _____Date: _____

KEY TO ICONS USED IN THIS MODULE

	Group work, but remember that you need to report back.		Individual activity
	Questions		Role-play
	Class discussion		Research
	Case Study		Notes and observations
	Formative Assessment Activity		Summative Assessment Preparation



LEARNING UNIT 1: APPLY PROBLEM SOLVING STRATEGIES

Learning outcomes to be achieved

- Define and analyse the problem.
- Evaluate solutions.
- Implement the solution.

1. INTRODUCTION

Solving problems may require a set of strategies to be implemented. Every problem may require a different strategy and it is up to you to decide what strategies to employ.

In this unit we will discuss how to define and analyse a problem as well as which strategies you may wish to use in order to solve the problem.

1.1 DEFINE AND ANALYSE THE PROBLEM

When you are facing a problem you should first define the problem. In other words you must decide what the nature of the problem is so that you and the people who you may be working with can understand what the problem is about. After all, one cannot solve a problem if you do not know what the problem is.

1.1.1 Identifying problem type, problem parameters and possible causes

Before you can solve a problem you need to know three things about that problem. They are the type of problem you are dealing with, the parameters that are involved and possible causes for the problem.

Let's use the pouring of cement as an example. Let's say that you need to pour cement at a steep slope. When you start pouring the cement you are faced with a problem that could set you back a few days. The cement keeps running off the slope. You have all of the necessary steel reinforcement in place and your concrete is mixed correctly.

Identifying the type of problem

How do we identify what the problem is? We know that our steel reinforcement is up to standard and that the cement mix is correct. We know that the slope is a rather unusual one but the problem can be overcome. Putting in more steel will not help to catch the concrete as it runs down the slope because the concrete is designed to flow around the steel and to be liquid for easy of pouring and to prevent it from setting in the concrete truck.

So the concrete is too liquid. Can we adjust the mix? Yes. Will it have any effect on the overall strength of the structure? No. Our type of problem is thus one of viscosity.

Problem parameters

Now that we know what type of problem we are facing, let's look at how we intend to fix it. We could try to add less water or more sand.

Now, parameters are boundaries in which we can safely operate. In this we can add less water into the mix which should ensure a thicker mix but if we add too little the mix may become brittle and weak. By adding more sand we could increase the volume of mix to water thus thickening the mix but if we add too much sand the mix will once again become brittle and break.

Our parameters are therefore:

- Amount of water
- Amount of sand

Possible cause

From here on it may seem easy. We could just go on and start mixing with less water or more sand but do we know which of these the actual cause is? We could speculate that sand is the main culprit but then again we know that the more liquid you add into a mix the more watery it become. Identifying the possible cause of the problem will set you on the right track to solving the problem. Having a cause in many cases may also mean having the solution. If the cause is too much water, then the solution is less water.

1.1.2 Collecting facts to meet the problem requirements

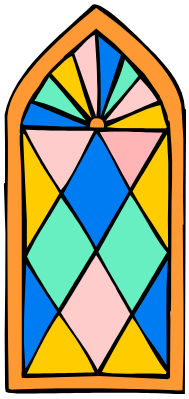
Now that you have identified the problem, the parameters involved and the possible cause you can start thinking about important facts that may influence the problem. You could find out whether a less watery mix will make it from the cement factory to the site without drying. Find out what financial impact the change in mix will have. You could also speak to the architect and find out whether the plans could be adapted to accommodate the parameters or lessen the problem.

1.1.3 Identifying problem components to determine possible courses of action

Once you have established the possible causes for the problem you should start thinking about what you would do to solve the problem. This is the course of action you plan to take. You may at this point think about setting up a test slope where new concrete mixes can be tested or experiment with smaller slopes. You cannot at this point start experimenting because you've just thought of the idea and a test area needs to be constructed. Hence this is only a possible course of action.

1.1.4 Analysing the problem for cross-cultural implications

Not everyone sees a problem in the same perspective and it may be due to their cultural background and differences therefore one should analyse solutions to identify any possible cross-cultural



implications it may have for instance, the way that a new sales solution accepts money from the client may not be in line with the beliefs of some of the staff members' or customers' religious beliefs.

According to human rights, every person has a right to religion and no person may deprive another person that right. If this means changing the way that something is done then one should consider the change.

ACTIVITY 1 – REVIEWED – US14927 SO1

Complete this activity in your Portfolio of Evidence Workbooks.

1.2. IDENTIFY POSSIBLE SOLUTIONS TO A PROBLEM BY USING PROBLEM SOLVING TECHNIQUES

Some problems can be rather complicated in solving and cannot be solved by one person alone. In such a case it would be necessary to employ special techniques to gather data or ideas for solving the problem. It may require further understanding of the problem and the following techniques should work just fine in such cases.

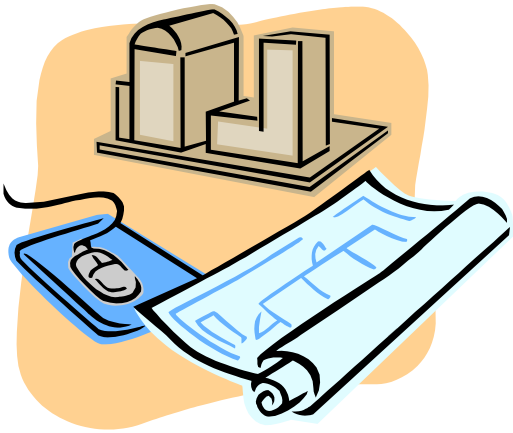
1.2.1 Brainstorming

Brainstorming can be an individual or group activity. A group of may come together and share ideas they may have for solving the problem. They will discuss each idea in detail and note its strengths and weaknesses. Eventually a consensus may be reached on which of the solutions may be the best candidate to solve the problem.

1.2.2 Mapping

Idea mapping (similar to mind mapping) can be used to further understand a problem. Idea mapping may be ideal in many cases since it may provide a visual, easy to understand representation of the problem and what is known about it.

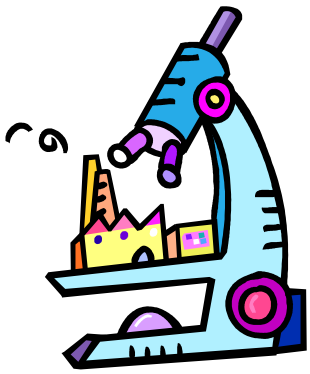
1.2.3 Computer Modelling



Scientists and engineers around the world rely on computer modelling to perform simulated tests on designs and concepts they have. Let's use the cement mix as an example. You may use computer simulations to digitally recreate the conditions of the cement casting and test various mixtures. The software will then provide an animated simulation of how the cement will act. Another example would be the design of electronic circuitry. There are extremely complex software programs that will simulate a circuit based on the components used.

In many cases, these modelling software not only provide the platform for design but also the tools you need in order to simulate certain conditions within a problem to see the possible outcomes and how the outcome would change by altering certain conditions.

1.2.4 Observation



Sometimes the luxury of computer modelling and simulations isn't possible either due to budget constraints or because of the type of problem you are facing.

Sometimes problems occur even if all of the design elements are correct and in such a case computer modelling may not be able to provide the clues you are looking for. You will need to apply your experience and intuition in observing the situation. After all, the human brain is an amazing tool and is quite capable of solving problems.

Let's say for instance a computer user is complaining about a problem that occurs on his computer. You have tried solving the problem by telephone by means of questions and answers but nothing provides a clue as to the cause of the problem.

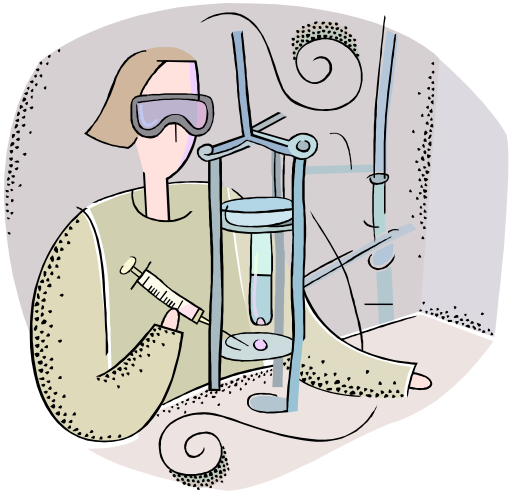
This would be a good time to employ observation. This would provide you with information such as what the user is doing when the problem occurs and how the computer reacts.

1.2.5 Questionnaires

Depending on the type of problem you are having you may wish to have people filling in questionnaires about the problem. For instance, people are complaining about your company's call centre but you cannot pinpoint the exact problem. Yet customers aren't satisfied with the service since the call centre agents are unable to effectively solve their problems.

You then contract another company who specialises in performance surveying. This company will design a questionnaire that will determine the types of problems your customers are having with your call centre.

1.2.6 Experiments



Experiments aren't just for scientists or overly clever people. It's an effective way to test the outcome of a situation should you alter certain conditions. Neither is it something that you learned in school about just to forget about it again.

When troubleshooting a computer for instance, there are many variables at play. The computer reboots every time it's placed under load and you have reason to believe that the memory may be faulty so you conduct a small experiment to see whether your suspicions are correct. You replace the current memory with another set that you know works and if the computer is then able to perform you know that the memory is to blame.

Basically an experiment is a test to see what happens if you do or change certain things with something.

1.3 ESTABLISH CRITERIA FOR EVALUATING SOLUTIONS TO MATCH THE TYPE OF PROBLEM

It is almost guaranteed that at some point you will have several viable solutions to one single problem. You must then consider criteria that may be important to the stakeholders.

1.3.1 Duration

If you are working toward a deadline, the duration of the implementation of the solution may be just as important as budget or difficulty of the implementation.

The implementation of a solution may sometimes entail downtime or time lost because the implementation requires that all other work be halted for the time being. The solution you choose may have to be quickly implemented to minimise downtime.

1.3.2 Causes

The Gautrain project encountered a collapse at one of the underground sections due to dolomite that softened. The team faced a problem because dolomite is a very unstable kind of rock. If it gives way once, you don’t know whether it will happen again.

This is a typical example where one should consider the cause of a problem before addressing it. Clearing out the tunnel may in most cases be the logical next step but in the case of Gautrain the installation of additional support and compaction of the dolomite was crucial to the progress of the project as this would address the cause while ensuring the solution would be successful.

1.3.3 Effects

The solution you implement will have certain effect on the project as well as its stakeholders and bystanders.

A factory determines that their annual outset is very low in comparison to their competitors. They also determine the implementing automation in certain areas of their process will speed up their manufacturing process at least 300%.

A second solution they consider is employing more hands in order to get more work done. This will up their output 250%.

The effects that the company needs to consider is that robotics can provide an additional 50% output. It will cost less and need less people to maintain. They will be more competitive and be able to penetrate the market at a faster pace.

Extra hands will create more jobs. It will also cost more to employ the extra hands. Employing extra people will result in additional human resource management. It will be more difficult to manage a larger amount of people.

1.4 POSSIBLE SOLUTIONS ARE EVALUATED AGAINST ESTABLISHED CRITERIA

The factory has set the criteria for their factory upgrade but they want to make sure the decision they make will be the best for the

factory. The factory may or may not have ethical policies that provide for the rights of the people who work there or they may be capitalistic.

They will evaluate the solutions they have identified against the criteria they have set. If they are capitalistic they will decide to implement robotics in order to gain more efficiency and save money through retrenching the unneeded staff.

If they are ethical they will decide to employ more staff which will cost them about as much as the robotics over a period of two years. They keep the current staff, up their production, possibly gain favour with their target market for making use of human power and gain favour with their staff for the same reason. Their new personnel may be able to up the outset enough to cover the additional cost and make a steady profit.

1.5 ENSURING THAT SOLUTIONS ARE SELECTED TO MEET CRITERIA AND PROBLEM REQUIREMENTS

There would be no sense in implementing a solution that will not meet the criteria and requirements of the particular problem and situation. There may be things like time allowed for implementation, budget available, resources available and requirements by company or customer legislation.

You and the IT department you work in have determined that one of your business critical servers is due for an upgrade. The problem is that the world economy is in recession, the company is

somewhat short on staff, and any upgrades can only be done either on a weekend or at night. Company legislation requires that all hardware be tested for reliability.

You have two different upgrade options which may or may not meet the criteria and/or requirements. The first option is to upgrade out-dated components the second option is to replace the current machine with a new machine.

1.5.1 Time

Upgrading the out-dated will be less time consuming since there will be no changes to the system's software except for drivers. This upgrade could potentially be performed in the evening.

Replacing the hardware will require backups from the current machine, a complete software reload, restoration of the backups and verification of the integrity of the new server's configuration. This could well need a weekend's worth of work.
If you would like to speed up the machine using the least amount of time, considering a simple hardware upgrade would be the better option.

1.5.2 Budget

Performing an upgrade of the out-dated hardware will cost less than replacing an entire machine though keeping old hardware and

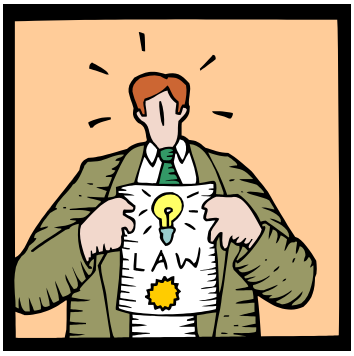
using new hardware with it may still result in some lack of performance.

Replacing all of the hardware will without a doubt is more expensive but will ensure that all of the hardware is have the latest technology to ensure that there are no losses of performance.

1.5.3 Resources

Performing a hardware upgrade requires fewer resources in terms of human power than a system replacement. This is because an upgrade will not require backup and restoration as well as the reload of software required by replacing the machine in its entirety. This may be desirable since not everyone will be keen on giving up a weekend for work.

1.5.4 Legislative requirements



Company legislation may require that the new hardware be tested and doing so will take time. Testing the new hardware of a system replacement may not be desirable because during the week everyone has other work to do and doing so on a weekend may eat away at precious time that you may need to sort out other problems. If you decide to simply upgrade some of the old components, you need less time to test the new hardware since there are less components that needs testing and the current hardware have already proved its worth through time.

ACTIVITY 2 – REVIEWED – US14927 SO2

Complete this activity in your Portfolio of Evidence Workbooks.

1.6 SOLUTIONS ARE TRIALLED AND / OR MONITORED FOR EFFECTIVENESS OF PROBLEM SOLUTION

When you plan to implement a solution to a problem it is often times best to first put the solution through a trial process to ensure that the solution is effective.

When thinking of large companies one may wonder how they successfully implement new products without causing havoc and major downtime. Some large companies may have computer laboratories where they would test new software, hardware or networking equipment for performance, reliability, user friendliness, installation requirements, ease of installation, projected time required for installation and the possible effects installation of the new technology may have on the company's day to day workflow. In the lab they will investigate any possible issues that the technology may have as well as compare it with other similar product to see which of the technologies have the most desirable characteristics.

1.6.1 Duration

In a product trial the company will run the technology for a certain amount of time and within that time they will determine the implication the implementation of that particular technology will have as well as the possible effect it may have.

1.6.2 Implications

In the trial period, the company's lab crew will research the possible implications the new technology may present. It may be licensing which translates to a financial implication and/or the amount of users that will be able to use the software. They will determine the amount of time necessary for the implementation as well as any additional infrastructure that may be required. They may also want to assess the need for training for the individuals who may be using the new technology and that will imply time and finances required for the training of those individuals.

1.6.3 Effects

The lab crew will be tasked with the job of determining the effect of the implementation of such new technology. They will assess any possible downtime to the company's infrastructure and how the new technology will affect the current workload. If it's a replacement for a current software system the company is using they may need to assess what effect the new software will have on the way data is entered into the system and also how the old data

will be transferred to the new system and the time required to do so.

1.7 ENSURING THAT SOLUTIONS ARE REVIEWED AND MODIFIED, AND PRACTICES ARE STANDARDISED WHERE REQUIRED

Once a new solution is implemented, it is always a good idea to perform frequent reviews to ensure that the solution is performing like it was originally intended. This review process will reveal any operational issues that were not foreseen by the initial planning and trials. In this stage one could identify and implement any best practices, systems and procedures that will refine the implemented solution to a well-oiled machine.

1.7.1 Practices

There may be several ways of operating with a new solution but only certain ways will provide the best possible outcome. A best practice provides a way for operators of knowing what the safest route in a process may be. For instance, customers may need to provide a customer card in order to trade with a company. There are other ways of identifying the customer such as a customer number, his company registration number, company name or even the person's ID number but to prevent fraud your company has determined that producing a customer card at the sales counter could lessen the risk of this and ensure that customers are who they say they are.

1.7.2 Systems

Identifying systems in this process will ensure that staff members or operators know what must be done. For instance, in some sales departments customers are required to move through several areas in order to purchase. First they need to place their order at a sales counter then they need to pay for the order and thereafter they must go to collections to obtain the goods they have purchased. This may require more staff but it does decrease the length of queues at the sales counter, lessens the risk of grab and run theft and ensures that sales persons don't become confused with all people, orders and payments. This also frees them to operate the telephone for people who phone to place orders.

1.7.3 Procedures

Procedures may be identified for certain situations. For instance, a customer wants to return a faulty product. To ensure that the company does not refund or exchange the product unnecessarily there should be a certain procedure to follow. The customer brings in the faulty item which is then booked in at the workshop. Thereafter a workshop technician will begin testing the product. Once the product's working status is confirmed the technician will check to see the warranty status of the item and the conditions of the warranty to determine whether item could be repaired or replaced under warranty. The technician will then quote the customer on the repairs should the item be out of warranty or

simply continue repair if the item is still within warranty. The technician will notify the customer once the repairs are completed.

This may still be classified as either system or procedure. Procedures can be even smaller system such as when entering an invoice into a system. The procedure for that will be to verify the identity of the client, verify stock, confirm the price with the customer as well as the items ordered to ensure the right items are invoiced and removed from the store room, then print the packing slip to the store room printer and provide the customer with an invoice number.

The purpose of such a procedure will be to ensure that the customer is legitimate, the customer pays for and receives the correct items and has a reference for paying for and collecting of goods bought.

1.7.4 Records

Keeping records of each step of the process will provide clues to flawed areas of the implemented solution or hard copies for reference should data become corrupt or lost entirely.

1.8 ENSURING THAT STAKEHOLDERS ARE CONSULTED DURING IMPLEMENTATION

This part of the implementation process is all about ensuring that the project is on track and that everyone is prepared for the implementation or parts thereof. A sales team may need to stop

invoicing customers on the old system in order for data to be carried over to the new system while ensuring consistency and eliminating possible loss of records.

Since the old records need to be carried over to the new system you need to communicate to the sales team and find out when they are willing to perform that task. They also need to know when they will start using the new system for invoicing.

Communicating with the stakeholders about planned implementation date, projected duration of the implementation and what is expected from them is an important factor in the smooth implementation of a solution.

ACTIVITY 3 – REVIEWED – US14927 SO3

Complete this activity in your Portfolio of Evidence Workbooks.

LEARNING UNIT 2: INVESTIGATE THE USE OF COMPUTER TECHNOLOGY IN AN ORGANISATION

Learning outcomes to be achieved

- Plan an investigation of the use of computer technology in an organisation
- Conduct an investigation of the use of computer technology in an organisation.
- Describe the use of computer technology in an organisation.
- Evaluate the use of computer technology in an organisation.
- Present the results of an investigation of the use of computer technology in an organisation.

2. INTRODUCTION

This unit provides an introduction to the practice of investigation based on the use of computer technology in an organisation.

The investigation of the use of computer technology in an organisation shall be tackled in four stages:

- Planning
- Establishing facts
- Evaluating
- Reporting

As a learner you are expected to identify and contact an organisation that you will investigate in order to be found competent in this unit standard. You will have to search and contact an organisation via phone, e-mail to set an appointment

with an explanation of why you would like to see them and you must make your intentions clear.

2.1 PLAN AN INVESTIGATION OF THE USE OF COMPUTER TECHNOLOGY IN AN ORGANISATION

Effective planning is a key component of any successful investigation: it will help you define the parameters of your investigation and keep you focused on what is relevant. It is always a good idea to draw a standard investigation plan at the start of every investigation, capturing the key issues and structuring your actions.

2.1.1 The scope and objectives of the investigation.

You cannot ever predict or tell with certainty what direction of an investigation will take. During the course of your investigation, you may uncover issues that require further research and consideration, and could result in significant revisions to your plan. Even so, a good initial plan will help you to reduce the disruption of unforeseen circumstances and keep your investigation on the right direction or focused.

In order to achieve the scope and objective of an investigation, a sample plan on the next topic might give you some ideas.
The plan will include the following sections:

- Information
- Business applications
- Action plan

- Resources and targets

➢ Information

In an investigation, to be well informed is a priority. You firstly need to collect more information based on your investigation from that specific company. This information can include their contact details and the type of services and ect.

From this, you should be able to work out what further information or evidence is needed to determine the success of your investigation.

Be as focused and precise as possible: being clear about what you need to know at this stage will help you avoid delays and distractions later on. You may find it helpful to produce a checklist of the elements that need to be proved.

➢ Business applications

Every business has unique aggregations of how to transmit messages, over significant distances, for the purpose of communication.

Investigate the type of technology that they are using currently and services that satisfy particular enterprise needs.

➢ Action plan

Set out how you intend to obtain the information you need. Your plan should include the witnesses (Company's manager or CEO) you intend to interview, the order in which the interviews will be conducted, the questions you need to ask and the areas you need to cover. It should also include any documents you need to obtain and any site visits you think would be useful.

It is usually best to secure all relevant documents before beginning the interviews as they may have an impact on the questions you want to ask. You should also consider what documents if any, you may wish to give to the interviewee before the interview.

- **Resources and targets**

At this stage, you should have a reasonable idea about the resources needed to complete the investigation, such as time and expenses. Record them on your plan and make sure they are available to you.

It is also recommend that you include target dates for completion of the various stages of your investigation and an overall target date for completion of the final report.

When all of the above information is gathered then;

Schedule a meeting

By now you have chosen an organisation to investigate about. To make things easy we are going to create our own imaginary company called Global Inc as an organisation.

You firstly need to have their contact details and the contact person, which may be the manager of the company or the CEO.

Search for the phone number of the company using the internet search engines or the phone book.

	The telephone numbers listed in the phone book or a web page will be of the reception (HR)

Find out from the reception (HR) who you can speak to for more information on you investigation. While you are speaking to the

person it's important to explain to her that you only need this information in order to complete your school assignment

Don't forget to have a pen and paper handy, to write down the person's name, email address or direct contact number.
If the manager or the CEO of that specific company agrees to see you schedule a meeting by agreeing to a date and time. This date and time must be convenient for both of you.

	Write down the time, date and venue of this meeting in your diary so that you don't forget, or be late for the meeting

2.1.2. An organisation that has agreed to be investigated.

At this stage you already have identified the company you need to interview and the areas you need to cover for your investigations plan, and considered the order in which they should be approached.
At the meeting your main objective will be to sell a solution or an idea to the company, although you are not going to implement your solution at this time. It is your duty to convince the company that they need the service you are offering them and that by utilising the service you can improve their work productivity and service level. Try to explain the main reason why you need to conduct this investigation, explain to him that you only need this information in order to complete your assignment
Emphasis computer technology important points relevant to the specific company you are dealing with.

2.1.3 Requirements of the investigation from the organisation.

Now that you have a specific company full attention;
Make sure that you have written down the correct contact information about the company, this information may include areas that you need to visit within the company such as the I.T department, people to be contacted based on your investigation subject and how much time will the manager give you, to conduct your investigation.

It is important to give the manager or the CEO a chance to ask questions about your investigation. Answer his question to the be best of you abilities- this will mean that you must know your product very well and be prepared to answer any questions that will be coming your way. To get this right you need to draw up a checklist according to your investigation.

Requests for information should:

- Be made in writing
- Explain the reasons for your request
- Be precise about the information you need
- Set a deadline for responding

2.1.4 The plan specifies milestones and reporting requirements.

Report writing is a time consuming business so it is a great shame if, having devoted all that time to writing your report, the quality is such that hardly anyone can be bothered to read it. Quite frankly,

most report readers do not actually read all the report; they are too short of time. You might as well know it and accept it -- that is normal. They only read the parts that interest them. Frequently these are the summary, the conclusions and recommendations.

Within the company, have a paper and pen handy to take notes as you pay visit to some of their offices. Try to indentify risks and problem areas, out dated equipment and type software that the company currently using. Talk to some of the employees and listen to what they think must be replace or upgraded, also listen to their ideas and suggestions if they have any.

Once you are done- sit down and setup a report for the manager or the CEO of the company give him feedback on you findings at his company.

Prepare a full report where you give solutions to your findings also give him full feedback on all the problems areas, risk and update. Be specific with some of the office locations.

Make suggestions to improvements to the manager

You must make the manager believe your suggestions will bring improvements in his company, be strong and confident when you speak to him.

If you are going to upgrade or setup a new company from scratch you will need to do some planning and investigating to determine the needs of the company.

To make your investigation easy you can setup a check list. Here are some examples of common question you can include in your check list.

Where you able to make an appointment	
What was your means of communication?	
What is the company's name?	
What kind of services are they providing?	
How big is the company?	
Who is the manager of the CEO?	
What are their contact details?	
What kind of equipment are they currently using?	
What kind of equipment do they need?	

Dates and Deadlines

To save time, it is always advice to interviewing the personnel who is the subject of the investigation first, for example, for an I.T. Department you will need an I.T. guy for your investigation as he is more knowledgeable. It may also help you establish which facts, if any, are disputed. Ask the manager how much time he/she will allow you to do your investigation and talk to the personnel.

Remember you do not want to disturbed his/her personnel, so be as quickly as you can. Ask for the current building layout (floor plans).

Ask the manager if they are planning to expand their business in the near future. Ask the personnel what kind of software they are using and if they are thinking of changing any software (e.g. database management software and other open sources). Check other workstations and find out what kind of equipment are they

using. Determine if the company has a budget for new IT equipment, if so what is the amount set out? Are they willing to pay for after sales support?

If so ask for the time frame they had in mind. Gather as much information as you can to your own business advantages.

Determining milestones; A milestone can be defined as a major event on a project or action plan. Each millstone has a specific end date also known as a deadline. Bigger project plans can run a number of milestones as indicated in the example below:

Milestone 1	Milestone2	Milestone 3
New computers must be installed in the workstation	Server must be installed allowing new operating system	Installing network cable and new

Remember that a milestone can be setup per day or it can run over a couple of months withy bigger projects. Milestones can be determined after the approval and confirmation of all documents signed by all relevant parties before the implementation of the plan takes place. To ensure good channels communication between you and the organisation the project plan or action plan must be set up. This is to ensure that feedback is given on the progress of the implementation. Feedback can be done on a report or you can create your implementation plan in a form of a check list.

Remember that the point noted on the approval documents will either be a deliverable or a milestone.

ACTIVITY 4 – REVIEWED – US14963 SO1

Complete this activity in your Portfolio of Evidence Workbooks.

2.2 CONDUCT AN INVESTIGATION OF THE USE OF COMPUTER TECHNOLOGY IN AN ORGANISATION

2.2.1 Investigation proceeds according to the investigation plan

Keep in mind that project plans or action plan can meet some changes on a long run. This can be picked up during the initial investigation. The cause of the changes may arise from your side or from the company's side.

Changing of plan during a project can affect the timeframe, the budget as while as the milestone. Looking at the milestone, let's pretend that, the last milestone you had was to install MySQL database. You then receive a request from the manager that the CEO and the I.T. department need the Oracle database instate of MySQL.

Currently MySQL does not have a true database engine; it does perform well for small deployments. The advantage; it's free.

The Oracle RDBMS stores data logically in the form of table spaces and physically in the form of data files. Table spaces can contain various types of memory segments, such as Data Segments, Index Segments, etc. Segments in turn comprise one

or more extents. Extents comprise groups of contiguous data blocks. Data blocks from the basic units of data storage. The disadvantage; is not free.

2.2.2 The investigation justifies any modifications to the plan.

After you have given the above feedback to the management they ask you to find a more cost effective way and solution to this problem. At this stage you must go and get quotes for the oracle database software and properly also learn more about it.

A full cost breakdown and a time estimate should be covered in your report. Your reasons for the choosing MySQL database instate of oracle database.

2.2.3 The investigation indicates progress at planned intervals.

The main reason of having milestones in a project is to monitor project's progress based on time and date as indicated on the example below;

Milestone	Time and date	Comments
Installation of new computers in the workstation	03/June/2011 Task complete	Start of deadline was met or not
Installation of network and ect	4-8/ June/ 2007 Done/not done	A detailed floor plan which indicates the network points, is attached to the report

Installation of a new database	4-8/ June/ 2007 Done/not done	Write a progress report to the management
Installation of a new database	4-8 march 2007 Done/not done	A report for feedback in written format. List programs in stalled
Installation of a new database	4-8 march 2007 Done/not done	User settings and permissions should be done according to management specification hand in a written report stating which user has got what settings and permissions and if you met your deadline

ACTIVITY 5 – REVIEWED – US14963 SO2

Complete this activity in your Portfolio of Evidence Workbooks.

2.3 DESCRIBE THE USE OF COMPUTER TECHNOLOGY IN AN ORGANISATION

2.3.1 The planning procedures used for implementation of computer technology.

This may vary from different organisation to another according to their design, development, implementation, support or management of information systems. Communication is one of the basic functions that affect every aspect when implementing computer technology into an organisation. Effective communication provides the necessary energy that is co critical for productivity. The communication process includes information sharing. This must be clear, relevant and produced in a timely manner. communication must be share at all levels within the organisation, which leads to the next basic function, employee buy-in. Communication is essential to the success of any project weather it may be technical or administrative. This seemingly simple function when not utilized will lead to misunderstandings and may produce results that are not intended communication.

It is essential to consider the following when planning;

Questions	Findings	Notes
Company's name	Global Inc	
Service that they are providing	Community development	
Their contact details	(021) 555 7777	
The name of the manager of the CEO of the company	Mrs J Matia	Confirm that she is the person to speak to

Questions	Findings	Notes
How big are the company?	Small business	How many users are computer literate and if all of the personnel need computer.
What kind of equipment are they currently using?	Laptops, desktop, Lexmark one in all printer	Find out what there job description are.
What kind of equipment do they need?	Photo copy machine, two new printer, 4 new computer	
Ask for the current building layout (floor plans)	Building plans- two floors reception and accountings are sitting down stairs, management and auditors are sitting upstairs	The building plan will also influence the planning. layout and the amount of time that you are going to spend in your investigation.
Ask the manager if they are planning to expanded their business in the near future	Yes, they are considering the option of appointing 4 new employees within the year.	A suggestion can be made to the company to invest and setup the 4 new computers now.
Ask the personnel what kind of software they are currently using and if they are thinking of changing any software.	They are currently using MS Office 2003 and windows XP Professional	Newer accounting programmes are available on the market e.g. Windows 7 MS 2010
Check some workstations	7 PC's are IBM with 20 GB hard drive and windows profession, 256 MB of ram 3hp laptops and 1	

Questions	Findings	Notes
	HP printer that is not working.	
Set yourself time limits	10 minutes per employee to check and ask for their suggestions.	This will help with time management and this will not disrupt the employee's to much,
Determine if the company has a budget for new it equipment	Yes, for upgrading and new equipment they have R65 000 for the this year,	This will help with time management and this will not disrupt the employees' to much,
Do they want support after the upgrading	Yes they want support for up to 6 months after the upgrading has been done with the option of renewal of sla,	A sla must be signed with the company for the support,

2.3.2 Personnel involved in the provision of computer systems.

Every I.T. or I.S. organisation has a team or an individual who is working on their I.T. or I.S. department.

- **IT Managers or officer**

The I.T. manager is responsible for the smooth running of a company on all phases of information technology (data centers, staff management, telecommunications, servers, workstation, web sets, user support, regulatory compliance, disaster recovery and etc.). The I.T manager connects with all the departments such as accounting, marketing, sales, distribution and etc., within an organisation.

At some companies, an I.T. manager can have direct influence on the strategic direction of an organisation, suggesting and helping implement technical stuffs within an organisation.

For example;

In other organisations an I.T. manager or officer is really a technician, a software developer, or network installer depending on the organisation

- **Vendors**

A vendor, or a supplier, is a supply chain management term meaning anyone who provides goods or services to a specific company. A vendor often manufactures inventorial items, and sells those items to a customer. However, today it means a supplier of any good or service including computer components.

Typically vendors are tracked in either a finance system or a warehouse management system. Vendors are often managed with a vendor compliance checklist or vendor quality audits. Purchase orders are usually used as a contractual agreement with vendors to buy goods or services.

ACTIVITY 6 – REVIEWED – US14963 SO3

Complete this activity in your Portfolio of Evidence Workbooks.

2.4 EVALUATE USE OF COMPUTER TECHNOLOGY IN AN ORGANISATION

2.4.1 The strengths of the computer systems in use

It is always an advantage to have an idea about the type of computer technology an organisation is using in order to draft a good investigation plan. In an organisation there are several advantages in use of computers. Paperwork takes up incredible amounts of room whereas data takes up only the digital space on a hard drive. Also, if you have a great deal of client information; it can be searched in seconds as opposed to minutes or even hours going through files by hand. Computers can also have applications that train newcomers to an organisation instead of placing a resource drain on the company by having employees that have to divert their own time and effectiveness to teaching someone.

On the other hand, they can be expensive to maintain properly and there's always the threat of a virus that can wipe your whole database. This can be averted with enough caution though, so it's not that great of a worry.

2.4.2 Future developments based on weakness and anticipated future needs

To advance what we do with computers, computers need to move beyond what they do for us today. Currently they are good at storing data, processing it, and moving it around through emails and etc. What they don’t do well is help us understand what the

data is or what it means. We know a JPEG standard for a picture format, but we don't know exactly what it's a picture of unless we open it. We can scan a picture of a person into a computer, but the computer can't search to find similar pictures of that person based on that scan.

The problem is ordinary computers don't model (a physical representation of an object) things. Aside from supercomputers, today's computers aren't capable of developing mathematical models of complex objects, systems or processes. Nor are they powerful or fast enough to perform such tasks at speeds people demand. Computers must have the performance capabilities and software to be able to construct, manipulate, and evaluate mathematical models. We need computers that can model events, objects and concepts based on what we show the computers and the data accessible to them.

ACTIVITY 7 – REVIEWED – US14963 SO4

Complete this activity in your Portfolio of Evidence Workbooks.

2.5 PRESENT THE RESULTS OF AN INVESTIGATION OF THE USE OF COMPUTER TECHNOLOGY IN AN ORGANISATION

2.5.1 The presentation meets the objectives of the investigation plan

Prepare a full presentation of your investigation plan with all the relevant documentation and filing. Your presentation must be focus on the objective of your investigation plan and findings along with a conclusion.

For example:

Your objective for the Global Inc. organisation was to investigate the type of computer software in using within the organisation.

And your findings where:

40% of people who are working at Global Inc. have no computer experience. At the present time there is no source of significant.

No funding is available for an organised program of research and development in the field of information technology.

Technical failures of computers are widely experienced, and this fact may inhibit private investment and may also slow down production chain.

Your conclusion;

It must revolve on your findings and solutions based on your investigation plan and implementation.

The conclusion outlines how the objective of the investigation was achieved. The plan may be modified during the task and changes justified.

2.5.2 The results of the investigation are reviewed for accuracy with the organisation

When you have concluded your investigation, you need to write up your findings in a report to the standards of the organisation. This report must be created in fulfillment of service level agreement between you and the organisation.

Example of the written report to the organisation

Milestone	Time and date	Comments
Workstation layout	15 August 2010 Task complete	Start of deadline was met or not
Installation of new server computer and file backup	16-18 August 2010 Done	Write a progress report to the management
Installation of MySQL database and the network cables	18-19 August 2010 Done	Give a detailed floor plan which indicates the network points, this can be attached to the report
Retrieving of backup files	19-24 August 2010 Done	A report for feedback in written format. List type of files retrieved
Installation of new operating systems and related software	24-30 August 2010 Done	User settings and permissions should be done according to management specification hand in a written report stating which user has got what settings and permissions and if you

Milestone	Time and date	Comments
		met your deadline

Total time 3 weeks
15-30 August 2010

__/____/2010 _____
signature

2.5.3 The presentation communicates the results of the investigation to peers

At these stage good communication skills is impotent. Group members must be clear of the task assigned to them. Better management procedures concerning skills election of peers is also a fact that can or prevent related technical and human operational failure. The evidence of planning may be oral, written, and/or graphic. Depending on the assessment context, the plan may include:

Key milestone outcomes;

- how resources such as time, expertise and materials (and finance, if appropriate) will be used to achieve the outcomes of each milestone;
- how consultation with stakeholders will be carried out to ensure that all constraints and requirements are met.

ACTIVITY 8 – REVIEWED – US14963 SO5

Complete this activity in your Portfolio of Evidence Workbooks.

LEARNING UNIT 3: GROUPS AND/OR TEAMS PROBLEM SOLVING

Learning outcomes to be achieved

- Contribute to team problem solving.
- Contribute to group and/or team functions.

3. INTRODUCTION

In the corporate environment you will find that group and/or teamwork plays a key role to the success of company projects. There for it is important that one knows how to constructively contribute toward the team/group's efforts. In this unit standard we will discuss the things you need to know in order to be as effective as possible while participating in a team or group.

3.1 MAKE CONTRIBUTIONS TOWARD TEAM OBJECTIVES

3.1.1 Ideas

Teamwork often includes throwing around ideas. One person may perhaps be able to come up with 2 or 3 good ideas but not all ideas are always the best. When working in a group or team you may find that discussing your ideas with the other members may either refine the ideas or find any weak spots there may be. Coming up with a flawed idea isn't always such a bad thing though. Many times one person's flawed idea may direct the thinking of the group in a whole new direction and in turn someone else may have an idea that will ensure the success of a project.

It is much like a game of soccer. Sibaya and Pienaar may have possession of the ball much of the time but they may be in more difficult situations for scoring the goal. In an attempt to score they might fail but McCarthy may just be in range to ensure the goal.

Having ideas that is relevant to the subject matter is the most important thing about having ideas in the first place. You may choose to share an idea based on its relevance to the problem at hand or share it even if it's not though you believe it may lead to someone else having an epiphany.

3.1.2 Information

Collecting information that is relevant to the subject at hand is also very important. When one is planning a project or solving a problem, having all of the facts together or not may mean the difference between a relevant and viable solution and a total disaster. The human mind cannot make decisions if there are no information on which to base a decision.

Here's a common example. A murdered may dump a body in a lake, clean the scene of the crime, and hide the weapon. He may also lie about his motives and whereabouts thus faking his alibi. This will leave the police and later the court without the necessary information to make a proper decision. It could also lead to someone being jailed for something they haven't done.

3.1.3 Opinions

Sharing each other's opinions is key to the wellbeing of the group especially if an important decision is to be made. One person may make a decision without asking everyone's opinions first. Someone else may have something important to say which the person did not think of. It could well be something that may prevent financial disaster or termination of the project. Opinions are all about considering the pros and cons of a decision you are about to make. Also remember that whenever you are part of a team it is important to consider the team's input. Undermining your teammates may cause a very unpleasant atmosphere.

3.1.4 Recommendations

Being part of a team or group also provide you with a wealth of knowledge resources. It is an instant gateway to other people's knowledge. We so often get stuck with a problem or we are not sure which solution would be best. Asking for a recommendation from a peer may well be the best thing you can do since you are all working on the same project, you understand all of the project's constraints and some of the members may have more experience with the type of project that you are working on.

3.2 DECISION MAKING PROCESSES AND CONTEXTS

Solving problems aren't always easy since even if the solution may seem simple, you will need to consider the impact a decision may have and how it will affect the outcome of the project. There are

methods for you to ensure that the eventual decision is as close possible to the best decision.

3.2.1 Decision making matrices

(Source: http://leansoftwareengineering.com/pugh-decision-matrix)
The decision matrix method was invented by Stuart Pugh and is also referred to as the Pugh method. It is a quantitative technique that is used to rank the multi-dimensional options of a set of options.

A decision matrix is commonly used when:

- You have an important decision to make between several viable choices.
- Your team is divided over an important decision
- A design decision or policy are being questioned and reconsidered years after it was made
- You are using set based development and need to decide on the final features for the next version of your program

How does it work? There are several steps as per the Pugh Concept Selection Process:

1. Have your team brainstorm all of the possible alternatives and list them across columns on a sheet then make one of them the default. This will often be the “do nothing” decision. This will be rated “0” for all of the decision making criteria. The “do nothing” decision is also referred to as the status quo.

2. Brainstorm criteria or characteristics that would be of importance to your customer or company. Write them down in the rows of a sheet.
3. Fill in 1, 0 or -1 in the main are of the sheet based on whether a decision will be better or worse than the status quo.
4. Adjust the rating weights if some criteria is more important that others or if a product is better than another. Do not go overboard with this though.
5. Now look at what the sheet is telling you the best choice will be. If you and the team or group feel good about the decision you are done.
6. If you are not satisfied with the decision, look at steps 1 – 5 again. Perhaps you have missed an important criterion. Also see if the weights you have assigned are close enough.

Which company's offer to accept	Weight	Current employer (Default)	Company A	Company B	Company C
Salary	1	0	1	1	1
Benefits	1	0	0	-1	1
Nice boss	1	0	-1	0	1
Workplace freedom	1	0	1	0	1
Totals			1	0	4

Table: Example of a decision matrix

As in the above example a comparison between potential employers and the sum of the weight assigned to each employer will show you which choice may suit you best. Clearly Company C has made you the best offer and you should go for it.

3.2.2 Nominal group technique

(Source: http://en.wikipedia.org/wiki/Nominal_group_technique)
The nominal group technique (NGT) is a technique used by groups of many sizes who would like to make their decisions quickly by means of a vote (not traditional voting where the largest amount of votes is considered) while considering every individual's opinion.

NGT can be considered as a possible alternative to brainstorming. It is a structured variation of the methods used in small group discussions. It prevents a discussion from being led by one single person by encouraging more passive members to participate and can result in a set of prioritised solutions or recommendations.

The process works like this:

1. The facilitator welcomes everyone and explain the purpose and the procedure of the meeting
2. Every participant is provided with a sheet of paper with the question being addressed and instructs the participants to write down ideas in resolution to the question. Participants are not to discuss any ideas with peers in this stage.
3. The facilitator invites participants to share their ideas. The ideas are recorded on a flip chart using the words as spoken by the participant. This process in round-robin fashion continues until all ideas have been presented. Participants should not debate any ideas but are encouraged to write down any new ideas that arise while other participants are presenting. This procedure will ensure an equal opportunity

to all participants. 15 – 30 minutes are usually enough time for this stage

4. Participants are now free to ask questions about other participants' ideas in order to gain clarity. The facilitator should ensure that everyone has an equal opportunity in contributing and that all ideas are thoroughly discussed without spending too much time on one single idea. This part of the process should be kept neutral at all times and that judgement and criticism is avoided. Ideas may be added but not eliminated. Ideas can also be categorised. About 30 – 45 minutes may be used for this stage.
5. Ideas are now prioritised according to its relation with the original question. Results are immediately made known to participants so that the meeting can conclude having reached a specific outcome.

The amount of nominal group meetings held will depend on the type of question and availability of the key stakeholders that are best suited in helping address the problem.

3.2.3 Consensus

Consensus decision making is a process used for making decisions as a group. The process not only seeks agreement of most of the participants but also the resolution of minor objections. Consensus can be defined as a general agreement but also describes the process of reaching such an agreement. Parliament also makes use of a form of consensus.

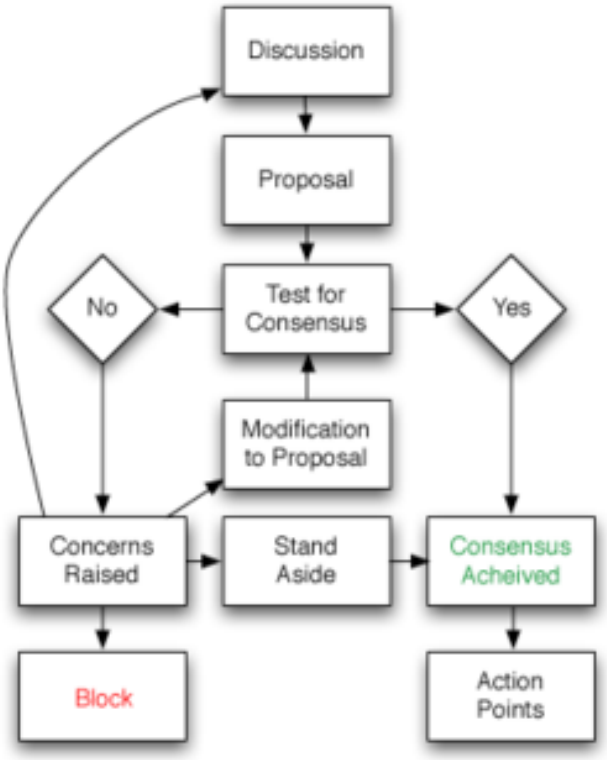


Figure: Basic consensus decision making flowchart

Consensus decision making isn't as formalised as other methods of decision making though there is a standard set of processes which can be commonly found in most implementations of consensus decision-making.

An agenda is set and (optionally) a set of rules are agreed upon after which the items on the agenda is discussed in turn. Every decision that arises from an agenda item follows through a simple structure.

- The item is discussed with the aim of gaining opinions and information about the topic. The general direction of the group as well as potential proposals for action is also sometimes identified during the discussion.
- A formal proposal that is based on the discussion is presented to the group.

- The decision making body's facilitator calls for consensus on the proposal. Every member of the group must usually state his agreement with the proposal usually by raising his hand or a coloured card to avoid the group interpreting silence or inaction as agreement.
- Should consensus not be achieved, each dissenter presents their concerns about the proposal that potentially starts another round of discussions that needs addresses or clarifies the concerns.
- The proposal is amended, re-phrased or reread in attempt to address all of the concerns that the decision-makers brought forward. The process will then return to the call for consensus. The cycle is repeated for as long as it takes to reach consensus.

This process often involves various roles that assist in assuring the efficacy of the process. Different groups may employ different roles but the most common ones to occur is the facilitator, timekeeper, empathy and the note taker.

- **Facilitator:** As the name suggests the facilitator's role is to make the process to consensus easier. The facilitator has the responsibility of ensuring that the proceedings are kept on schedule, ensuring that the group adheres to the terms that were mutually agreed upon before the proceedings and if the necessity arises suggests alternative or additional discussion or decision making techniques such as go-around, break-out groups or role-playing. Some consensus groups make use of two co-facilitators. This may be to

diffuse the facilitator's perceived power and creates redundancy should a facilitator become too involved in a debated.

- **Timekeeper:** This person's purpose is to ensure that the decision-making body adheres to the schedule set in the agenda. A timekeeper may use several techniques to ensure the schedule is kept. They may give frequent time updates, warnings about short time, and keep individual speakers from taking excessive amounts of time.
- **Empathy or "Vibe Watch":** This role monitors the "emotional climate" of a meeting and takes note of the body language and other non-verbal clues the participants may present. Defusing emotional conflicts, maintaining an intimidation free climate and being aware of potentially destructive power dynamics such as sexism or racism between members of the decision-making body, are the primary responsibilities of the empath.
- **Note taker:** Also known as the secretary, this person's role is to document the decisions, discussions and action points of the decision-making body.

3.2.4 Majority vote

Majority vote is a decision rule that selects alternative by means of a vote in which the majority (more than half) wins. This type of decision making have the following properties:

- **Fairness:** This can be broken down into two properties

  - **Anonymity:** Normally voters cast their vote by writing it down on paper. Each voter is treated identically. It does not make any difference who has voted.
  - **Neutrality:** This method treats each alternative equally unlike super majority rules that could allow an alternative with fewer votes to win.
- **Decisiveness:** The decision rule will select a unique winner
- **Monotonicity:** The method will always select the alternative a voter prefer should that voter change his decision should that alternative have won before the change of preference. This method would never select a candidate that voter did not prefer if that alternative would not have won before the voter changed his preference.

3.3 MAKING OBJECTIVE DECISIONS

It is important to state that one should never attempt to make important business decisions by means of emotion. One should always be objective and weigh up the pros and cons of certain decisions compared to others. Not doing so could cost people their jobs but even worse, it could cost you yours and even worse than that, it could cost people their lives.

Here's an example; you are on a construction site and a heavy loads needs to be lifted into the air by means of a crane. The crane can only hold 20 tonnes but the load is about 30 tonnes. The motors may be strong enough to lift the load and the structure has a 10 ton threshold though the cables only have a 5 ton threshold. You are under a lot of pressure because the job site is behind

schedule and this morning the boss came to the site ranting about the deadline and the penalties that they will have to pay if the site isn't completed in time. The lift is already a week behind schedule. Some people were fired too because they did not do the job properly. Would you go ahead and lift the load?

Non-objective decision

You are under a lot of pressure and waiting for a more capable crane could take a day or two. You decide to get it over and done with otherwise the boss will be breathing down your neck. Half way into the lift a wind starts blowing out of nowhere and the crane topples over. Was this a good decision? Clearly it wasn't.

Objective data-based decision

Based on the specifications of the crane and the load that needed to be lifted, you consult with the boss a few days before the lift and discuss with him your concerns about the impending dangers of the lift. Your boss immediately realises that another crane needs to be called in for the job. Was this a good decision? Yes, because you considered the available data in an objective fashion and made sure that the lift could be done on schedule while also ensuring the safety of the people at the site.

Another example may be a company who decide add a new product to their inventory. Before they make the decision they should first gather data on their target market. Find out whether there are enough people interested in the product and whether there's a need for the product. For instance, selling mining equipment in an agricultural district wouldn't be too much of a good

idea. They need to consider all of the data before stocking the new product.

It is also a good thing to use data in order to make your decision because if anything does go wrong in the future you will have a means of protecting yourself and proving that the decision was in fact the best one based on the data that was available at the time.

3.4 VERBAL AND NON-VERBAL FEEDBACK

There are two ways in which one can provide feedback in a meeting or discussion. They are verbal and non-verbal.

3.4.1 Verbal

One can easily give verbal feedback by means of questions and/or answers though the asking of questions is known to encourage people to participate in a discussion. The human mind is always seeking answers and by asking a question in a discussion you may trigger someone else's interest in the topic. Think of a classroom situation. When do you learn best? Is it when the facilitator reads page upon page of boring information or when he starts asking questions about the work? It is when he asks question that you start thinking and considering possible answers. It is also when you may realise that there is something which you do not understand. At that point you will start asking questions and perhaps some other learners will start asking questions as well. This Q&A process stimulates your brain and upscale your interest in the subject as you go along because you now feel good. You

don't just feel good because you are learning new things but because the questions you ask promotes the participation of the other students and eventually could start a whole new discussion based just on that one question you asked.

3.4.2 Non-verbal

People tend to react to what they see. Your body language plays a big role in what you say and how your message is carried over to the other team members. Body language could include hand gestures, smiling the right way, making eye contact with everyone or nodding at what someone says. Coming over positively toward others by means of your body language could make that person feel relevant and included. It usually takes a small spark to light a fire and communicating in the right way by means of body language could unlock some tremendous inputs from the person it's meant for.

ACTIVITY 9 – REVIEWED – US14920 SO1

Complete this activity in your Portfolio of Evidence Workbooks.

3.5 SHARE RESPONSIBILITY AND CREDIT FOR SUCCESS OR FAILURE

Being part of a group means that one has to participate 100% in everything the group endeavours in a project even if means taking the blame for something that's gone wrong or sharing credit that was meant for you. Your group will value you as a member thus seeing you as a more credible contributor to the group's efforts.

3.5.1 Support

If your group has made a decision in terms of a current project or problem you will need to support their decision in full and if you don't you will need to find a way to do so. The success of the group is up to the weakest link and you need to ensure that you do not become that weak link.

Supporting the group's decisions will ensure unity in the group and help the group achieve its goals effectively.

3.5.2 Responsibility

Quite often it will happen that a decision made by the group backfires and then someone is usually blamed. If one single person are to blame for the problem it means that the team wasn't in unity and someone wandered away from what the group originally decided to do.

Sometimes something will go wrong and there is no single person to blame. Whatever the case, it is up to the group to correct the

problem. The group's leader is always at task to lead the members of the group and to minimise the possibility of problems occurring. Nevertheless, whether one single person, parts of the group or the group as a whole could be blamed or not it is the responsibility of every member of the group to do damage control and attend to the problem as that guilty party is still part of the group and the failure of one person is the failure of the group.

We can also say that every member of a group is responsible for sharing their successes with the group. While one person may have had a breakthrough it is deemed the breakthrough of the group and therefore credit must be given to all of the group members since their efforts may have contributed toward the breakthrough.

3.5.3 Acceptability

Having failures is part of everyday life. One needs to fail in order to try again with the new knowledge of the previous failure and by doing so eventually reaching your goal of success. If a person or the team fails at a task, it is up to everyone to accept the failure and learn from the lessons that come with it. Then, once everyone has accepted the failure they need to move on and find a way of preventing the failure. The last the one should do in case of failure is to blame people for the failure. Remember that other people are humans too.

3.6 OVERCOME OBSTACLES

Everybody knows that a team needs to work together in order to be successful. With that in mind, we can also say that the team needs to maintain itself by means of rules, parameters, guidelines and the clarification of issues. Only if everyone is on the same page can the group function truly efficiently.

3.6.1 Rules

Rules are there for everyone to know how to treat certain situations and how to treat one another. They secure respect for each other and for formalities such as meetings. It is a defence against unruliness and chaos. Rules are a set of values and guideline that help individuals decide how to act.

Some examples of rules and where they apply are:
Attitude and culture:

- Respect one another
- Avoid being defensive and give constructive feedback
- Help and support one another in order to solve problems and finish behind schedule work.

Team meetings:

- Regular weekly meetings will take place on Mondays at 09:00 AM
- All team members are expected to attend the meetings unless a valid excuse can be provided

- Meeting minutes will be distributed within 24 hours after the meeting.

Communication and decision making:

- Only one person is permitted to talk at a time. No side discussion are allowed
- Open and honest communication is encouraged – no hidden agendas
- We accept responsibility as well as the accountability that comes with it

3.6.2 Parameters

Parameters and rules go hand-in –hand and they are both essential to the success of a team. Though rules are there for members to know what should or shouldn't be done and the fashion in which things should be done.

Every team member need to know what it is that the team needs to achieve as well as the parameters involved in order to achieve that goal. There are many parameters for good teamwork and they resemble that of good leadership.

There are several common parameters that create a good team culture. These are also the boundaries in which team members are to act.

They are:

1. Focus on stakeholder outcomes
2. Smart goals
3. Committed leadership
4. Mutual trust
5. Engaged leadership team members

3.6.3 Guidelines

Both team members and team leaders have certain guidelines that will help them excel at their individual roles. It is important that one follow these guidelines and constantly reflect on any probably weaknesses.

For a team leader it is specifically important to know his guidelines as well as that of the team members. This will help him be a better leader as well as to help his team members understand what is expected of them. It will help him analyse the strengths and weaknesses of the team in order to optimise their performance.

The basic guidelines for a team leader are as follows:

- Understand the strengths and weaknesses of the individual team members
- Meet with team members regularly and get to know and honour individual team member goals
- Understand how people and personalities may match or mismatch in the team
- Obtain training in listening skills and conflict resolution and, if possible, allow team members to get similar training

- When conflict occurs, find ways to resolve it quickly and assertively
- Have frequent team meetings to ensure a high level of effective communication
- Have a positive outlook and share it generously

The basic guidelines for team members are as follows:

- Understand own work style and capabilities
- Trust others' capabilities
- Understand that working with others is an opportunity to learn, teach and share
- Be willing to teach each other new techniques
- Share data and ideas with each other
- Help each other troubleshoot and identify root causes of problems
- When conflict occurs, find ways to resolve it quickly and assertively
- Do not be afraid to share the credit for work with others
- Have a positive outlook and share it generously
- Enjoy working with other people
- Enjoy working towards a common goal
- Take responsibility for the team environment

3.6.4 Clarification of issues

Every project is custom made with its own set of issues. For a project to be successful, an effort needs to be made to clarify all of the issues involved in the project. This will ensure that issues are

treated with caution and that workarounds or solutions are found and implemented. The team will be more efficient once everyone fully understand the issues and the possible constraints they may place on the function of the team. This will also ensure that

Different issues can be ranked according to severity and importance. The clarification of an issue takes in to consideration the situation, stakeholders, consequences, information needs and priority considerations.

3.7 TECHNIQUES MATCH THE TASK REQUIREMENTS

Nothing in the corporate world is ever as easy as one would like it to be and therefore teamwork is important but how can teams come up with ideas and understand the problems at hand? Two widely used techniques are brainstorming and mind mapping. These techniques will help teams understand problems and reference certain aspects of the problems at a later stage while still providing much needed contexts. For instance, you may be addressing one specific aspect of a project but you need to understand where that aspect fit in to the rest of the project so that you can correctly address the problem.

3.7.1 Brainstorming

Many groups make use of the brainstorming technique to come up with ideas and possible solutions. Alex Osborn, the Madison Avenue advertising executive in the 1950's came up with the technique in order to stimulate lateral thinking within his team.

Brainstorming makes use of a relaxed environment where everyone can feel free to contribute to the process no matter how big or small their ideas may be. In the end the important thing is to get as many ideas as possible from as many people as possible. It overcomes many of the problems that are related to group problem solving.

There's a standard procedure for conducting a brainstorming session:

- Set the problem
- Create a background memo
- Select participants
- Create a list of lead questions
- Session conduct
- The process
- Evaluation

Brainstorming can be conducted in several ways by use of:

Nominal group technique

Discussed in 3.2.2

Group passing technique

Each person in a circular group writes down one idea, and then passes the piece of paper to the next person in a clockwise direction, who adds some thoughts. This continues until everybody gets his or her original piece of paper back. By this time, it is likely that the group will have extensively elaborated on each idea

Team idea mapping method

This method of brainstorming works by the method of association. It may improve collaboration and increase the quantity of ideas, and is designed so that all attendees participate and no ideas are rejected.

The process begins with a well-defined topic. Each participant brainstorms individually, then all the ideas are merged onto one large idea map. During this consolidation phase, participants may discover a common understanding of the issues as they share the meanings behind their ideas. During this sharing, new ideas may arise by the association, and they are added to the map as well. Once all the ideas are captured, the group can prioritize and/or take action.

Electronic brainstorming

Electronic brainstorming is a computerised version of the manual brainstorming technique. It is typically supported by an electronic meeting system (EMS) but simpler forms can also be done via email and may be browser based, or use peer-to-peer software.

Directed brainstorming

Directed brainstorming is a variation of electronic brainstorming (described above). It can be done manually or with computers. Directed brainstorming works when the solution space (that is, the criteria for evaluating a good idea) is known prior to the session. If known, that criteria can be used to intentionally constrain the ideation process.

Individual brainstorming

"Individual Brainstorming" is the use of brainstorming on a solitary basis. It typically includes such techniques as free writing, free speaking, word association, and drawing a mind map, which is a visual note taking technique in which people diagram their thoughts. Individual brainstorming is a useful method in creative writing and has been shown to be superior to traditional group brainstorming.

Question Brainstorming

This process involves brainstorming the questions, rather than trying to come up with immediate answers and short term solutions. This technique stimulates creativity and promotes everyone's participation because no one has to come up with answers. The answers to the questions form the framework for constructing future action plans. Once the list of questions is set, it may be necessary to prioritize them to reach to the best solution in an orderly way.

One of the difficulties of brainstorming may be to determine the type of brainstorming best suited for a situation.

3.7.2 Mind mapping

Mind maps are used to visually represent ideas and how they relate to each other. The most common implementation of mind maps is usually by students.

Our brains are usually only about 1% active and only by utilising our full brain capacity can we effectively learn and understand what we are learning. In order to achieve this state of mind, it is necessary for us to employ all of our cortical systems (left and right brain cortex).

How to mind map:

- Start in the centre with an image of the topic, using at least 3 colours.
- Use images, symbols, codes, and dimensions throughout your Mind Map.
- Select key words and print using upper or lower case letters.
- Each word/image is best alone and sitting on its own line.
- The lines should be connected, starting from the central image. The central lines are thicker, organic and flowing, becoming thinner as they radiate out from the centre.
- Make the lines the same length as the word/image they support.
- Use multiple colours throughout the Mind Map, for visual stimulation and also to encode or group.
- Develop your own personal style of Mind Mapping.
- Use emphasis and show associations in your Mind Map.
- Keep the Mind Map clear by using radial hierarchy, numerical order or outlines to embrace your branches.

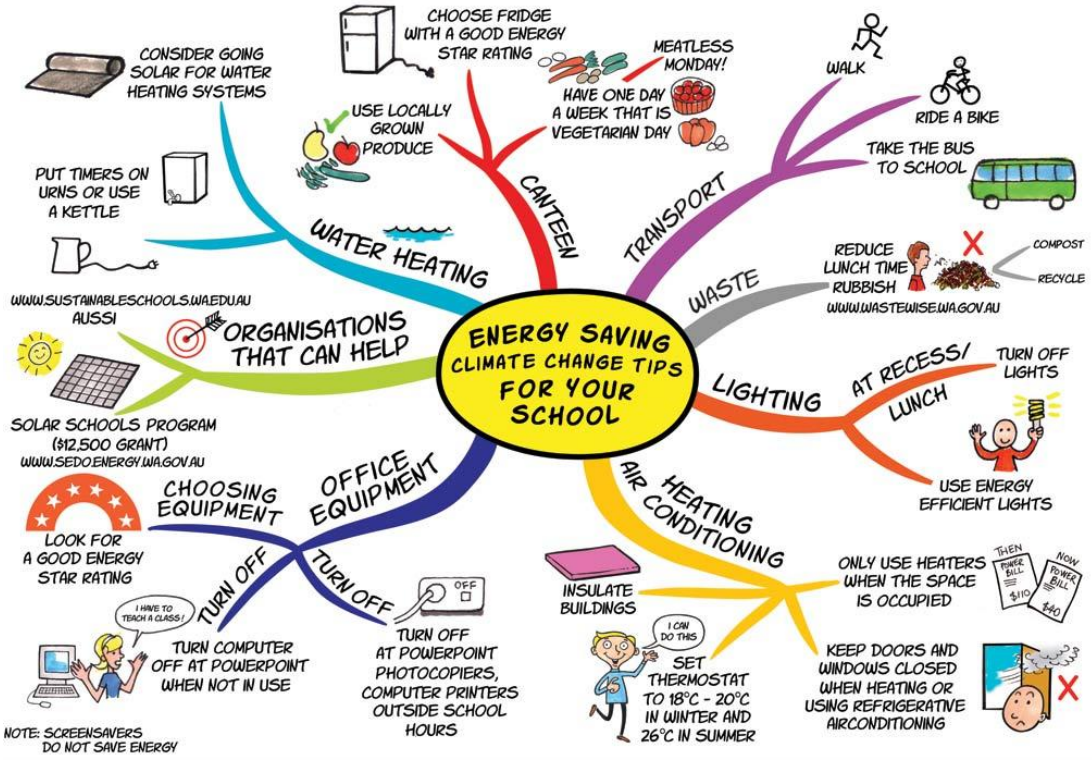


Figure: Example of a mind map

3.8 MONITOR OWN BEHAVIOUR

There are certain things with regard to behaviour that any team member should always consider. One should always adhere to procedure; consider your language, tone and control mannerisms. Being in control of these aspects will ensure respect from fellow team mates as well as smooth workflow.

3.8.1 Adhere to procedure

Procedures are normally set in place so that everyone knows how to resolve a situation and have something to reference when any uncertainty arises. A procedure is a range of actions or procedures

that one must follow in order to achieve the same result under the same circumstances.

One could have procedures laid out for certain things such as medical emergencies, handling of customer queries, filling in of performance reports, tax returns, breakage of equipment etc.

Sometimes, not following procedure could lead to warnings, hearings and even dismissal.

3.8.2 Language

Having respect for one's fellow team mates and the customers/clients one work with is important because it sets the general image of the team. Foul language could sometimes be interpreted as discrimination against another person whether it was meant in that sense or not. Foul language can also sometimes be interpreted as anger.

When working on a sales or support team, one may have encounters with customers that are unhappy about a product or service that they've received. The best thing to do here is to keep calm and understand the customer's situation. There's no better way to calm a customer that being calm yourself. This is probably the most difficult thing to do since a customer outraging against you may naturally trigger your defences. One need to learn how to channel those defences through the right "filters" so that the outcome will be positive.

3.8.3 Tone

The tone of your voice may give indication to your emotions and also the amount of respect you have for someone. Working in a team requires you to be humble and always speak calm and casually. This will prevent conflict between you and your team mates. It is also important to watch your tone when speaking to clients since them more than anyone could misinterpret the use of wrong tone. They do not know you as well as your team mates do.

3.8.4 Mannerisms

Your mannerisms are the way that you react to authority and respect people with authority. For instance, your team leader asks you to do something that someone else cannot do due to some authentic reason. You cannot decline the order without proper reasoning; neither can you put up a fight about it. In the end you need to do whatever is asked of you.

There are certain ways for a person to act in certain situations. In meetings for instance, it would be proper if you raised your hand before interrupting the facilitator. It would also be proper to ask for permission before you leave a meeting no matter how briefly you may be gone on whatever the reason may be.

These days it is more acceptable to address your superior by name but in some corporate situations it is still unacceptable. Company executives may expect staff to stand up when they enter

the room. It is also a good idea to look an executive or superior straight in the eyes when greeting them and firmly gripping (not squeezing) his hand. Avoid greeting superiors with slang language e.g. “Hey, wazzup Martin?” Rather say, “Good morning Martin” or “Good morning sir, how are you today?” This is true even if your boss or superior is your best friend. In a workplace, you need to maintain a professional image and treat everyone with respect.

Being respectful and respectable doesn’t stop at how your talk and walk but also take into consideration your attire. Companies such as banks and law firms encourage a formal dress code. This portrays the image that the people at that company know what they are doing.

Similarly, some companies may encourage an informal yet neat dress code. This will typically be at construction companies, some sectors in telecommunications companies, IT companies etc. The people who are able to wear casual attire are usually not people in the position of financial and business decisions. They may be at product development and customer services where a less formal “first impression look” is necessary. It is needless to say that this type of attire still need to be neat since worn out clothing may portray the image that the company employs slobs.

Remember that you are your company’s interface with its customers. Your superiors and the company owners or directors aren’t able to interface with all of the customers so they expect of you to represent them instead. If you set a bad image of yourself you set a bad image of them.

3.9 DELEGATED DUTIES ARE CARRIED OUT

It will sometimes happen that you are selected to perform some key tasks within your team. To you they may not seem significant but they are indeed important and you need to understand why.

3.9.1 Distributing meeting papers

Before a meeting starts, whether with company executives or clients, it is important that meeting papers containing the agenda of the meeting be distributed to all of the parties involved. This may be done by either e-mail or before the meeting starts.

In doing so you ensure that everyone knows what the meeting is about. Distributing the papers by email could help other parties prepare for the meeting and bring along relevant information and resources or presentation materials depending on the nature of the meeting.

3.9.2 Minute taking

During the course of a meeting some important things can happen or be said. Normally there will be a meeting secretary that takes note about the important discussions and points made during the meeting. It is then that person's responsibility to distribute the minutes after the meeting so that it can be referenced afterwards. This is especially important because when you have a meeting with a client or company executive there may be issues or concerns that need to be looked in to. These will be taken down on

the meeting minutes for discussion in a team meeting so that feedback can be provided to the client or the executive.

3.9.3 Time keeping

Sometimes when working on a tight schedule it may be necessary to employ time management for a particular meeting. Some types of meetings such as consensus and nominal group also require for time keeping. Effective time keeping will ensure that enough but not too much time is spent on a specific topic. It will also ensure that all the topics on the agenda are covered. There would be no use in having a meeting if no one got the chance to say what they were there to say.

3.9.4 Team presentations

There will be times that you need to present an idea to company executives, a potential client or an existing client. In order to be successful you need to ensure that you are well prepared and have a comprehensive presentation prepared. Your presentation should clearly state the idea, the reason for the thinking behind the idea, problems that the client has, special needs for the client, problems that the team may have and how the idea will provide a solution to the problems and needs presented.

Presentations are all about marketing. You need to be able to convince your audience that the solution proposed is the correct solution. Though, you need to be completely sure of your facts and

well prepared for any question the audience could possibly have. Do not panic if you are unable to answer a question. Humans cannot possibly know the answer to every question though it is probably better to say something like, “I am not entirely sure about that but can we get back to you?” rather than “Uhm…. Uhhhh… I don’t know”. This doesn’t normally go down too well with the coffee that was served which may be cold by now after all the stuttering.

Work out a projected time line for each section of your presentation. Your audience probably know most of the problem that they have and that’s probably why they hired you. Try and get to the point as quickly as possible without boring your audience. Work in some strategic humour since we all know that people who work in an office all day is quite immune to the caffeine in coffee so you need a different way to keep them awake. But don’t just use random humour and it needn’t be a joke that is told. Make use of humorous images that is relevant to the topic. Interesting and colourful images should also do the trick.

You should be able to easily pick up on the general atmosphere and judge by that whether your presentation is keeping on too long or not.

3.10 ALLOCATED TASKS ARE CARRIED OUT

Your contribution to the team’s efforts is just as important as that of any other team member. You need to be resourceful, open-minded and analytical about your tasks. You can do this by obtaining

resources, evaluating ideas, gathering data and researching information.

3.10.1 Obtaining resources

Once you've been allocated a task the first thing you will do is obtaining the correct resources in order to perform the task. You should realise that now that you have a task to perform, the person who gave you that task expects of you to have the tools to do the job.

Resources can be in the form of funding, equipment, facilities, people or anything else required for the completion of the task.

3.10.2 Evaluating ideas

Our minds automatically evaluate ideas as they come in and give recognition to the ones that are familiar to us. We therefore immediately deem these ideas as acceptable though other ideas may be just as or more acceptable. It is therefore an important task to take a look at all the ideas that you have or have been given and evaluate them one by one, identifying any possible weaknesses, strengths, difficulties, required resources, viability, etc.

Set up criteria for the task at hand, then take every idea and decide how that idea will conform to the criteria. You may make use of a decision matrix as well. In this way you will be able to

determine which of the given ideas may be the best to fit the completion of your task.

3.10.3 Gathering data

Once you know how you will go about completing your task, you should gather all of the necessary data that is needed. If you are writing a program or a module for a program, find out which variables the program will use, if you are installing the plumbing for the new house find out where the connection points are, how much material is needed etc. Or if you are going to prepare a meal for a large dinner, find out who's vegetarian, whether any food allergies exist, are there any Halaal guests etc. A Police SWAT team may wish to find out how many suspects is present, what type of weapons they're carrying, are there any hostages, how many hostages, armouring and so on.

Gathering data will help you to correctly complete the task and ensure all round satisfaction. Through the examples above you could see why it is important to gather data before initiating a task.

3.10.4 Researching information

You may not always have all of the required information in order to effectively complete a task. Let's say for example you are planning a new building and you already have data/information such as budget, desired style, capacity, surrounding area, location, etc. This information would not be enough for the planning task to be

completed. You could go ahead and draft your plans but do you know the history of the ground you will be working on, the composition and type of ground, building styles of the surrounding buildings or even the climate?

Your client may have provided you with certain information or data but you as an architect or civil engineer need to find out what elements you need to consider in order for your design to work and last.

In a programming environment your client may have asked you to write them a financial management system with integrated staff, payroll, and training management. Thus you know which components are required but you still need to research how those components are supposed to function. There may be certain regulations with regard to financial management that you need to obey or certain data types that need to be present. You could go ahead and write the program in the way you would expect it to operate but there may be a necessity for the program to be able to export data in certain formats for accounting purposes and so forth.

3.11 OUTCOMES AND FINDINGS FROM ALLOCATED TASKS

Your contributions need to conform to certain aspects such as relevance, clarity and timelines. These will help your team see how your work puzzles in with theirs.

3.11.1 Relevance

Your work must be relevant to the project it relates to. There would be no point in drafting a report program that is meant for project management if your team actually needs a report program for a financial system. Your work need to be useful and easily adaptable to suit the needs of the project. Another example may be if you are required to gather information about the inner workings of a certain type of machine but instead you gather information about the process of the machine. Some of the information may be useful since it could point to the functions of certain components though it won't tell the team exactly how the electronics work and how components fit together.

Being relevant in what you do will eventually contribute to the amount of value your team mates can gain from the work that you've done.

3.11.2 Clarity

In a programming environment it is especially important that you be clear about what you do. You may decide to use a longer, more complex set of code for a certain function instead of something simple. You will need to explain in your code what the thinking was and also what the purpose every step is. There's a simple reason for this; the next person to work on your code may well not be you and that person won't have a way of understanding what you were trying to accomplish with the extended code. So, the person could

just pick up the phone and ask you. What if you are out of reach? Perhaps you have passed away or you are abroad for business or training? This is why it is important for you to be clear in your thinking and actions so that the next person will be able to go on as if he was you.

3.11.3 Timeliness

Almost every project you will work on will have some sort of timeline connected to it. This timeline will set specific dates for certain things to happen. We call these deadlines. Normally a project in itself has a deadline which means that all work should be finished by then. Quite similarly, every task within the project will have a deadline of its own.

Once again we look at a building site. The whole project may be set to complete in 2years 6months time. Within that timeframe there may be 100's of tasks that all need to be completed otherwise the following task cannot start and this in turn will put the whole project behind schedule.

For example, when construction is started the first thing that needs to happen is for the foundation to be dug, and then poured. If the trenches for the foundation aren't ready by the time pouring is set to start the orders from the concrete factory need to be postponed otherwise the concrete may arrive at the site only to harden inside of the trucks which in turn will cost the company money and time.

Making sure that your work is completed on time will be beneficial to your team since other people's deadlines may depend on you

being timely. Being timely will attribute the productiveness of the entire team. One can say that one delay causes another delay and later everyone is delayed.

ACTIVITY 10 – REVIEWED – US14920 SO2

Complete this activity in your Portfolio of Evidence Workbooks.

LEARNING UNIT 4: RESOLVE COMPUTER USER'S PROBLEM

Learning outcomes to be achieved

- Receive computer user's problems.
- Investigate computer user's problems.
- Implement solutions to computer user's problems.
- Close resolved computer user's problems.
- Forward unresolved computer user's problems to appropriate area.

4. INTRODUCTION

4.1 COMPUTER USER'S PROBLEMS

4.1.1 What is a user?

A user is a person who uses a computer or Internet service. A user may have a user account that identifies the user by a username, screen name, or "handle", which is derived from the identical Citizens Band radio term. To log in to an account, a user is typically required to authenticate himself/herself/ as a user with a password or other credentials for the purposes of accounting, security, logging, and resource management.

Figure – A desktop computer (also referred to as a workstation)

Users are also widely characterized as the class of people that use a system without complete technical expertise required to fully understand the system. In most hacker-related contexts, they are also divided into lusers and power users. Both are terms of degradation, but the latter connotes a "know-it-all" attitude.

Terms of agreement with user. Terms of agreement is the agreement you sign as a guideline of the things that are required to do and not to do on the system or on your allocated computing device.

User's problems are those problems experienced by users when using a computer or computerised system.

4.1.2 User identification

Identification is the process whereby a call centre operator or network element recognizes a valid user's identity. Authentication

is the process of verifying the claimed identity of a user. A user could be a person, a process, or a system (e.g., an operations system or another network element) that accesses a network element to perform tasks or process a call.

A user who is experiencing the problem needs to be identified in order to get the correct address where the service for fixing the computer problem, needs to be deliver.

Secondly, the user needs to be identified in terms of the support contract or Service Level Agreement (SLA) which specify the support that the user is entitled to as well as the performance level for giving the support. For example the managing director's secretary must be supported on all computer and network access problems within 1 hour.

The following can be used to identify the nature and level of support that the user is entitle to: the purchase record of the computer equipment, the service level agreement (SLA) and the agreement terms for the purchase/service.

A user identification code is sometimes used, especially if the user is identified via a network connection. It is a non-confidential auditable representation of a user. Information used to verify the claimed identity of a user can be based on a password, Personal Identification Number (PIN), smart card, biometrics, token, exchange of keys, etc. Authentication information should be always kept confidential.

INFORMAL CLASS ACTIVITY

INFORMAL ACTIVITY

Complete this activity in your Portfolio of Evidence Workbooks.

Our Company System Administrator (SA) or information assurance security officer (IASO) or IT manager will ask you to sign a copy the following agreement before issuing you a password that will give you access to the computerised system.

As a user of an information system, I will adhere to the following security rules

1. I will use information systems (computers, systems, and networks) only for authorised purposes.
2. I will not import any privately-owned software or install hardware on any computer device (for example, client-workstation or server) without first getting written approval from my manager.
3. I will not load any software onto my computer device or network without the approval of my manager.
4. I will not try to access data or use operating systems or programs, except as specifically authorised.
5. I will not allow anyone else to have or use my password. If I know that my password is compromised, I will report to System administrator for a new one.
6. If my account is on a classified network, I understand that my password is classified at the highest level of information on that network, and I will protect it in the same manner as that information.
7. I am responsible for all activity that occurs on my individual

	account once my password has been used to log on. If I am a member of a group account, I am responsible for all activity when I am logged on a system with that account. 8. If I have a classified account, I will ensure that my password is changed at least once every 90 days or if compromised, whichever is sooner. 9. If I have an unclassified account, I will ensure that my password is changed at least twice a year or if compromised, whichever is sooner. 10. I will not store my password on any processor, microcomputer, personal digital assistant (PDA), personal electronic device (PED), or on any magnetic or electronic media unless approved in writing by the my manager 11. I will not tamper with the computer device to avoid adhering to the official password policy. 12. I will never leave the computer device unattended while I am logged on unless the computer device is protected by a "password protected" screensaver. 13. I know that it is a violation of policy for any computer user to try to mask or hide his or her identity, or to try to assume the identity of someone else. 14. I know that if connected to the Network, my computer device operates at least in the secret mode. 15. I must protect all material printed out from the system until I or someone with the appropriate clearance personally reviews and properly classifies the material. 16. I will not enter information into a system if the information has a higher classification than that for which the system is rated. I will not enter information that is proprietary, contractor-excluded, or otherwise needs special protection or handling, unless approved in writing by the System administrator. Acknowledgement: I have read the above requirements regarding use computer devices and access to official systems.

	I understand my responsibilities regarding these systems and the information contained in them. Computer User _____ Date _____ Security Officer _____ Date _____ IT Manager _____ Date _____

4.1.3 Recording the computer problem

Then a user is experiencing a problem with a computing device, it should follow the prescribed procedure and contact the person responsible for maintenance or the call centre - if the organisation is using a call centre through which problem must be routed. When reporting a problem the following information should be made available to the person receiving the complaint: The date the problem occurred; the circumstances when the problem occurred; any symptoms that is different from when the computing device was functioning normally; the address where the computing device is located and the time available for an technician to access the device for investigation. Indication should also be given is data on the device is back-up or should be back-up by the technician.

The computer problem report consists of at least the following information:

- Speculate wildly about the cause of the problem
- Problem Severity
- Nature of the problem
- Indicate if the computer is plugged in

4.1.4 Communication with users

Users need to be put at ease with regard to the computer problem that they experience. Communication with users needs to be professional but sympathetic. It needs to reflect confidence and bring about an experience of service excellence with the user. A professional Code of Conduct accepted by the organisation delivering the service to the user community will allow for these criteria to be achieved through the application of training and repeatable processes.

User satisfaction is of utmost importance and needs attention by the person taking the call from the user. If you work as a computer technician in any company, your manager will assign a number of users to you; who will come to you for assistance and keeping their computers running smoothly or solving their hardware and software problems. Being assigned to a specific number of users to look after, give you the responsibility to look after them and to identify the reasons for their computer problems.

Once you know which users have been assigned to you, you need to know the terms on which you will be offering them your support. This means that there will be a user's support agreement that takes effect after you have bought or received a computer. It agrees to offer you help if your computer gives trouble. However, a user's support agreement usually has certain terms and conditions such as:

- If your computer breaks down, the company will send a technician to your home or arrange to collect the computer, fix it and return it to you within 48 hours
- You cannot take your computer anywhere else to be repaired without voiding the agreement.

Service excellence. A computer technician must be a person who really understands computer problems so that it will be easy to identify the problem. Most importantly, it mustn't take too much time to fix problems as work will be delayed. Time is Money and in that way there must be no time consuming.

Personal communication techniques with users. The way you responds to people who need solutions to their problems is important, it must be professional and have confidence to the problem brought forward. When another person speaks, we are listening at one of four levels: namely ignoring and not giving any attention, pretending to listen but not giving proper attention, selective listening aims at hearing what we want to hear and attentive listening give full attention to the person speaking and try to understand what is said. This not only apply to the person taking the complaint from the user but also the user when receiving feedback from the person taking the complaint or the technician investigating the defective computing device.

Effective communication requires you to not only formulating a message in such a way that the other person will be able to understand it but also to anticipate how the other person will "hear" it.

Do you think you can respond, to an e-mail complainant as follows?

Hi Lucky Really busy. Will fix your mouse as soon possible. Kind regards, Justin

Communication between you and users must be smooth and give the user hope that the problem will be fixed, and in a timely fashion. It is very important that communication is timely and that the user is kept up to date with progress.

Resolving problems to user's satisfaction. When it is your job to receive user's problems, you will be dealing with users who are frustrated. When a user's computer has a problem, the user has to stop working to get the problem fixed. This means there will be time consuming. So when you respond to users request to have their computers fixed you need to understand that they are frustrated and unhappy. You can make them feel happier by reassuring them that you will fix their computers as quick as possible.

If you can, try to help them to continue with their work by making arrangements and find equipments that they can use while they wait for their computers to be fixed. For example in case of Lucky above, you could arrange a spare mouse for him to use until his mouse is replaced or fixed.

4.1.5 Assigning a timeframe and priority to the problem

When the computing device was acquired by the user, standards were agreed to with the user for responding to any user problem. Some organisations set specific standards for specific type of users depending on the type of work the user is doing and how critical that task is to the organisation. This is referred to as the timeframe for completion of the repair job. Such repair priority criteria greatly determine the estimated costs of repair as it will determine if 1, 4 or 24 hour standby is required or if a repair timeframe such as 7 or 30 days will be acceptable.

As a computer technician, it might happen that you have many problems to deal with at one time. So how do you decide which job to do first?

How to assign a timeframe. Everyone needs his or her computer fixed first as soon as possible and everyone think his/ her job is the most important one. It is therefore important to decide which jobs to do first in what order. It is also important to spend as little time on each job as you need to. Let look at the following issues in detail:

Timeframes and organisation standards. It might happen that the organisation you work for has a standard about how long users have to wait for their computers to be fixed. For example, your manager might say that you have a maximum of one hour to troubleshoot, fix and test peripherals, such as mouse and keyboard.

The timeframe you assign to each job depends on a few other factors too. First how much work do you have? If you have two jobs to do the whole week, you can assign a longer time frame than if you have more than two jobs a week. Second, how urgently does the user need the job to be done? For example the Marketing Director is flying to USA tonight to give a presentation about the company. Her laptop's monitor has problems; you have to assign a shorter timeframe to that task, so that the Director will be on time for her flight.

Timeframes and the terms of the user's support. Looking at how user support terms work. Some agreements state, for example that the manufacturer will collect, repair and return your computer within 24 hours after you reported the problem. If timeframes are part of the user support terms, you need to fix the user's problems within that timeframe.

How to assign a priority. Like in timeframes, your organisation might have rules whose problem must be looked after first or must be the first priority according to their positions. For examples the organisation must state that manager’s problems must be solved first.

Priority and the terms of the user's support. It might happen that the computer technician working at the company where you bought your laptop is having too many computers to fix just on the very same day you bought your laptop to be fixed. However he will have to fix your laptop since the agreement with the manufacturer

states that your laptop will be returned to you within 24 hours. Then your laptop became the first priority.

ACTIVITY 11 – REVIEWED – US14919 SO1-3

Complete this activity in your Portfolio of Evidence Workbooks.

4.2 INVESTIGATE COMPUTER USER'S PROBLEMS

4.2.1 Information sources to identify known problems

Problems with computer are basically divided into two groups, i.e., hardware problems and software problems. The hardware problems are related to the peripheral parts of the computer like the CD drive, hard disk, monitor, keyboard, etc. You can read more in detail about computer hardware basic information related to computer hardware troubleshooting. The software problems are more complicated. These problems include problems like modem problems, Windows not starting, drivers not found, etc. The first step to fix computer problems is computer problems troubleshooting. Understand what is causing the glitch and follow the standard procedure to solve the problem. The computer problems listed in paragraph 4.3.1 are a few common computer problems (and solutions) to help you overcome the technical snag.

Known problems and solutions are listed in manufactures' reference manuals in on-line fault databases as well is in big organisations own documentation developed by their technical support staff.

Users can avoid problems if they are aware of the various steps needed for computer maintenance. Users should read the manual given with computer before you begin using it. Yes, the manual may sound Greek to you, but it's always better to know the simple precautions to be taken. Computer problems troubleshooting are not an easy task.

4.2.2 Computer Problems and Solutions

You should be able to diagnose the problem to be able to correctly fix the computer problem. If you do not understand anything or are still apprehensive about computer problem troubleshooting, then it is a better idea to consult a computer technician. But before you do that, you have many articles on the Internet that help you find solutions to various problems with computers. You do not need to be genius to diagnose and troubleshoot a simple computer problem. Many times a little bit of presence of mind and common sense will help you overcome obstacles of the technical world.

To find the cause of a computer problem, problem isolation techniques applicable to both hardware and software, should be used. Start with the most obvious problem such as is the computer plugged into the electricity supply, or is the printer connected to the computer. If this is not the problem, then start by looking at things

that can be wrong that takes the least effort to check such as mouse or keyboard working properly or is windows correctly installed with all the software drivers and updates. Once all these obvious aspects have been checked could you start look at courses that are more difficult such as the register of the computer or problems with the mother board or power supply. The following are some examples.

Computer Problems after Power Outage. Today there are many sudden power outages, voltage problems and spikes that can damage computers. These damages cause many technical and software snags and interrupts your work. This leads to loss of data, damage to the hardware, etc. due to sudden power outage. This is a common computer problem.

Solution: use of uninterruptible power supply (UPS). The UPS can provide a constant flow of energy to the computer, even if you encounter a sudden power outage. This will provide you with ample time to save your data and shut down your PC, if needed.

Computer Performance has Slowed Down. You may notice your computer has slowed down considerably and even a simple command execution takes ages. This is because your computer is loaded with unnecessary files, fragmented data, corrupted registry, spyware programs, services, software, etc. that makes your computer slow down.

Solution: Thus, you need to manage your programs and delete unnecessary data and software that you do not use or need, clean your registry regularly to help boost at least 30% of your computer performance speed.

No Sound from Speakers. You are in the mood to listen to some groovy music on your PC, but you get no sound from speakers.
Solution: The solution to be to check the back of the computer and see if all the connectors are properly connected. The speaker or single stereo speaker plug should be put into the socket on the soundcard that has a mark Audio Out.

Computer Monitor Displays Fuzzy Images. A computer monitor is the display unit of the computer that is sensitive to electro-magnetic radiations. These electro-magnetic radiations are transmitted from the TV, radio, microwaves, dishwashers, washing machines, speakers, etc. Mobile phones transmit electro-magnetic radiations that are one of the main causes of monitor displaying fuzzy images.
Solution: move the disturbances away from the monitor and this problem with computer monitor will be fixed. You can read more detailed solutions in the article on computer display problems.

Computer Freezes with Blue Screen Hijacking Your Display. There are many problems that can cause your computer screen to freeze and blue screen to appear. This may be due to spyware or computer viruses that have affected your computer. Other causes may include hardware failure such as faulty memory, incorrectly installed or malfunctioning hardware drivers or other severe software crashes. A faulty or damaged hard drive can also be a cause since information sent from the hard drive may be corrupt and unusable to the system causing it to freeze.

Solution: You need to update your anti-spyware and scan your computer for any viruses. If your computer is free from any such malicious software, then you may need to update your hardware drive. A hardware drive that is not updated may cause the CPU to lock up and interrupt working of the computer. If you find the problem cropping up even after a hardware drive update, then you may need to increase computer RAM. When you increase the RAM, the computing power increases and you will also be able to avoid the computer freeze.

Computer Reboots Itself Again and Again. One of the most common problems with computers today. In order to fix computer problem of rebooting itself again and again, you will need to check the hardware.

Solution: You may have a faulty power supply, defective or dirty cooling fan, etc., that may cause the computer to reboot again and again. The dust that accumulates on the fan, makes it heat up faster and in order to cool down the computer automatically switches off.

Computer Makes Strange Noises. Noises and vibrations from your computer are basically a hardware problem. Many electronic parts can make high pitch noises.

Solution. You need to switch off your computer and unplug it from the power supply. Now remove the case from the CPU and restart your computer. Locate the origin of noise and then switch off the

computer and unplug it. It may be a faulty fan, loose wire or screw. This means you will need to call the computer technician to help you solve your problems with computer, regarding these types of problems.

Windows Having Problems in Shutting Down Properly. You may have come across the message 'Windows Shutting Down' instead of 'It is now safe to switch off you computer'. This is because a program has not unloaded itself properly that makes the computer insist to run a scandisk the next time you switch on.

Solution: You need to close all the programs before your shut down your PC and if it is not done, the computer waits for the program to close. It may happen you get the message 'Do you want to shut this program down or wait' or you may not. When you don't get such a message it results in what we call the hanging of the operating system. The solution is not to install Direct X whenever you install a game. Most games have their version of Direct X that makes the files out of sync. Thus, install the latest version of Direct X and not the games version. You may need to also check USB devices, task schedulers, virus scanners, etc. and reinstall them if necessary. This will lead to correct installation and the problems with computer may reduce.

Problems with insufficient power supply. This is one of the procedures to troubleshoot computer hardware problems that can either be very simple or can go way beyond your capability to solve. The solution may be as simple as replacing the power cable with a new one or as complicated as dealing with the SMPS of the

computer system. The SMPS is the Switched Mode Power Supply, the box at the upper left hand corner of your CPU, which powers up each and every component in your computer. If the problem lies with the SMPS, then solving it is not one of the DIY tasks that you would like to take up at home. It will need good technical expertise to solve the problem. Many a times, the problem may have just one solution, that is, replacing your computer's SMPS.

4.2.3 Fault database for recording problems

The technician doing the investigation records symptoms of unresolved identified problems that should be forwarded to technical support services for resolution. Users should be advised by the technician on site that the computing device will be taken in for repairs. This kiks of a chain of events: The technician should advise users of the timeframe to resolution and expected progress according to the terms of their support agreement. The technician (as the first line support) or supporting staff should also inform third parties (those responsible for second line support) of the computing device that needs repair terms of the user's support agreement.

A formal system for analysing computer operations problems, comprising: a fault history database storing a set of fault records, each fault record corresponding to one of a set of possible computer operations problems, having a fault source, and comprising attributes relating to at least one of an identity, category and timing of said one problem; and fault analysis subsystem operatively coupled to the fault history database and receiving

there from a subset of fault records, the fault analysis subsystem configured to: determine a set of fault statistics based on the subset of fault records, and responsive to the determination of the set of fault statistics, identify certain fault sources of the set of fault records as being responsible for the computer operations problems.

- Wherein the set of fault statistics relates to CPU usage, number of faults, and fault category.
- Wherein identifying certain fault sources of the set of fault records responsible for the computer operations problems comprises identifying fault records from a set of given categories of fault records.
- Wherein the set of given categories of fault records corresponds to a selected analysis perspective.

The fault analysis subsystem configured to generate rankings for fault sources responsive to the determined set of fault statistics, and flags for fault sources responsive to a standard deviation of the ranking with respect to a mean of rankings of other fault sources exceeding a given threshold, the fault analysis subsystem configured to cause fault sources having flags to be visually displayed in a manner distinguishable from fault sources not having flags.

The fault analysis subsystem configured to present the identified fault sources in a report, each identified fault source accompanied by a key benefit of resolving the operation problem to which the

fault source corresponds, the key benefit being described in terms of a statistic from the set of determined fault statistics.

A method for analysing computer operations problems, comprising: receiving a set of fault records, each fault record corresponding to one of a set of possible computer operations problems, having a fault source, and comprising attributes relating to at least one of an identity, category and timing of said one problem; determining a set of fault statistics based on the subset of fault records; and responsive to the determination of the set of fault statistics, identifying certain fault sources of the set of fault records as being responsible for the computer operations problems.

- Wherein the set of fault statistics is calculated as a function of CPU usage, number of faults, and fault category.
- Wherein identifying certain fault sources of the set of fault records responsible for the computer operations problems comprises identifying fault records from a set of given categories of fault records.
- Wherein the set of given categories of fault records corresponds to a selected analysis perspective.

Further comprising calculating rankings for fault sources as a function of the determined set of fault statistics, and flagging a fault source responsive to a standard deviation of the ranking with respect to a mean of rankings of other fault sources exceeding a given threshold, the flagged fault sources when displayed to a user being visually distinguished from fault sources not flagged.

Further comprising presenting the identified fault sources in a report, each identified fault source accompanied by a key benefit of resolving the operation problem to which the fault source corresponds, the key benefit being described in terms of a statistic from the set of determined fault statistics.

A tangible computer readable storage medium storing a computer program executable by a processor for performing analysis of computer operations problems, the actions of the computer program comprising: receiving a set of fault records, each fault record corresponding to one of a set of possible computer operations problems having a fault source, and comprising attributes relating to at least one of an identity, category and timing of said one problem; determining a set of fault statistics based on the subset of fault records; and responsive to the determination of the set of fault statistics, identifying certain fault sources of the set of fault records as being responsible for the computer operations problems.

The set of fault statistics is calculated as a function of CPU usage, number of faults, and fault category.

Identifying certain fault sources of the set of fault records responsible for the computer operations problems comprises identifying fault records from a set of given categories of fault records, the set of given categories of fault records corresponds to a selected analysis perspective.

A method for analysing computer operations problems, comprising: receiving a set of fault records, each fault record corresponding to one of a set of possible computer operations problems, having a fault source, and comprising attributes relating to at least one of an identity, category and timing of said one problem; determining a set of fault rankings based on the subset of fault records, the determination comprising: grouping each fault record according to the identity attribute, thereby producing a set of fault sources, each having a set of fault records; calculating, for each fault record of each fault source, a set of statistics as a function of fault record attributes; responsive to values of the calculated set of statistics for each fault source, determining a ranking for each fault source, thereby producing the set of fault rankings; and responsive to the determination of the set of fault rankings, identifying certain fault sources of the set of fault records as being responsible for the computer operations problems.

4.3 IMPLEMENT SOLUTIONS TO USER'S PROBLEMS

When troubleshooting a user’s computer, there are several very important factors to bear in mind. Some of them are: Timeframe for repair, Workshop schedules, Deadlines, Minimise disruption to user with the last one probably being the most important. It is important to ensure that that user’s system is returned as soon as possible. There are certain guidelines and resources one can use to ensure the speedy return of a computer system.

First we’ll have a look at the timeframes and things to consider when removing a computer system for repair. Thereafter we’ll look

at what can be done to help along the repair process and to ensure that future diagnosis and repair of problems are easily dealt with. We'll also look at ways to keep track of system progress when working in a busy workshop environment.

4.3.1 Ensure the user's system is returned as soon as possible

It is important to keep in mind that the user also have work to do and not having the ability to perform his tasks may in turn cost the company money or may result in the user falling behind with his work.

Time frames of repair. Knowing the timeframe you have to perform repairs on a system will help you plan the implementation of the repair. It will also help you prioritise systems in order of importance. Time frame also plays a key role in the quality of the work you deliver. Working within a realistic time frame will ensure that you think your diagnosis and actions through. Not having the benefit of a realistic time frame may result in a lopsided system and may mean a revisit somewhere in the nearby future. Though this is not the ideal situation, it sometimes is the only option you may have. Know your cards and when to play them.

Workshop schedules. Another factor at play is the schedule of your workshop. Not only do you have systems that are waiting to be repaired but you may also have new systems awaiting preparation and installation. For instance, a company has hired 25 people who all need working computers on their desks the moment

they walk in on their first day. It's not difficult to see why this may be a problematic situation. It's a play-off between 25 computers vs. 1 computer for repair.

One way to cope with this kind of overhead is to have production lines set up. That way you can have several computers in preparation and while you wait for them to finish installing or whatever they are doing, you can continue working on other priority tasks. This is a great way to get a lot done in very little time. It will save you time, it will save your company money and it will make the users feel that you put them first. Do not work harder, work smarter.

Deadlines. We touched this topic briefly in the above discussion with the example of the 25 new employees. Everyone dreads deadlines. It places everyone under a lot of stress and sometimes causes other important things to go by unnoticed or get left forgotten. This is why systems that arrive for diagnosis need to be labelled and entered into a system that will keep track of progress and notify you when they are due for delivery. Project management software may provide you with this functionality though there are other products that are better focused with the workshop in mind.

Minimise disruption to the user. In the end, it is all about minimising disruptions to the user. If possible, try to diagnose and solve the issue at the user's desk. The last thing they want is for their computer to be removed. It's an inconvenience no one wants. If you do need to remove the system, it is a good idea to have a backup system on which the user can commence work. Larger

companies have intranet system with network storage that will allow for a seamless swap out of the user's computer. Typically in such a case, the user logs on to a domain controlled or LDAP server which authenticates the user. The user's profile is then loaded from the intranet server which also tells the computer where to find the user's data. The user can then use e-mails and their documents as if the computer was never removed.

This kind of set up is normally somewhat more expensive and cumbersome because all information is stored in one location. It is a risk and one needs to ensure that the proper backup procedures are in place in case of a hard drive failure, theft, fire or other kinds of damage.

4.3.2 Make use of reference sources to find known solutions to known problems

Diagnosing a problem isn't always an easy task and trying to figure it out by yourself can cost you precious time. Luckily there are resources you can use to help you solve your problem.

Reference manuals. Some computer or device manufacturers supply the device with a troubleshooting manual. These manuals will provide you with the most common problems, their symptoms and the known solutions.

Fault database. You can use two different types of fault databases. Most manufacturers have a knowledge base or forum on their website and you should use this. Manufacturers work

tirelessly to find all the issues before you do so that they can provide you with an answer when you need it. These databases can however sometimes be difficult to navigate so you may want to keep your own knowledge base. This will certainly be a great timesaver since you will have all the problems and solutions to the devices that are common to your environment. The database you keep will be far smaller than that of the manufacturers and will therefore be much easier to navigate saving you time by making it easy to find a solution.

Ask other technicians. No two persons can ever have exactly the same experience even if they were in the same situations before. Asking fellow technicians for advice is always a good idea. It will help them keep tabs on their knowledge and it will help build your knowledge. Sometimes technicians in your workplace don't have the answer and that's when you should start making use of the internet. If you have a problem, the chances are someone else somewhere in the world has had the same problem as you. Internet forums are the most likely place where you will find these questions and answers. They are sometimes in depth discussions with lots of trial and error methods that may just deliver your success. Some forums you may want to visit are: www.mybroadband.co.za, www.itweb.co.za, www.prophecy.co.za and www.tech-forums.net.

Supplier staff. Phoning the people you bought the devices from is also good idea. They receive faulty hardware all the time and customers tell them about issues that they have encountered.

They will almost certainly be able to help you or point you in the direction of someone who can.

4.3.3 Solving the unknown issue.

Sometimes there are new issues no one has heard of and no known solutions are available. This isn't necessarily a very common occurrence but it does happen. If a problem does show up which there isn't a solution for it may be a good idea make notes of your diagnosis. Write down things you see or hear, noises that the computer may be making or whether it's overheating, maybe the fans aren't spinning correctly... Anything that you notice that seems to be out of the ordinary. In the end when you draw up your conclusion and solve the problem, you will be able to see which of the symptoms have disappeared. Those symptoms may be the key to diagnosing the problem next time you or a colleague come across it. Adding this to your knowledge base will provide you and your colleagues the ability to more effectively diagnose and solve problems on the same types of devices in future.

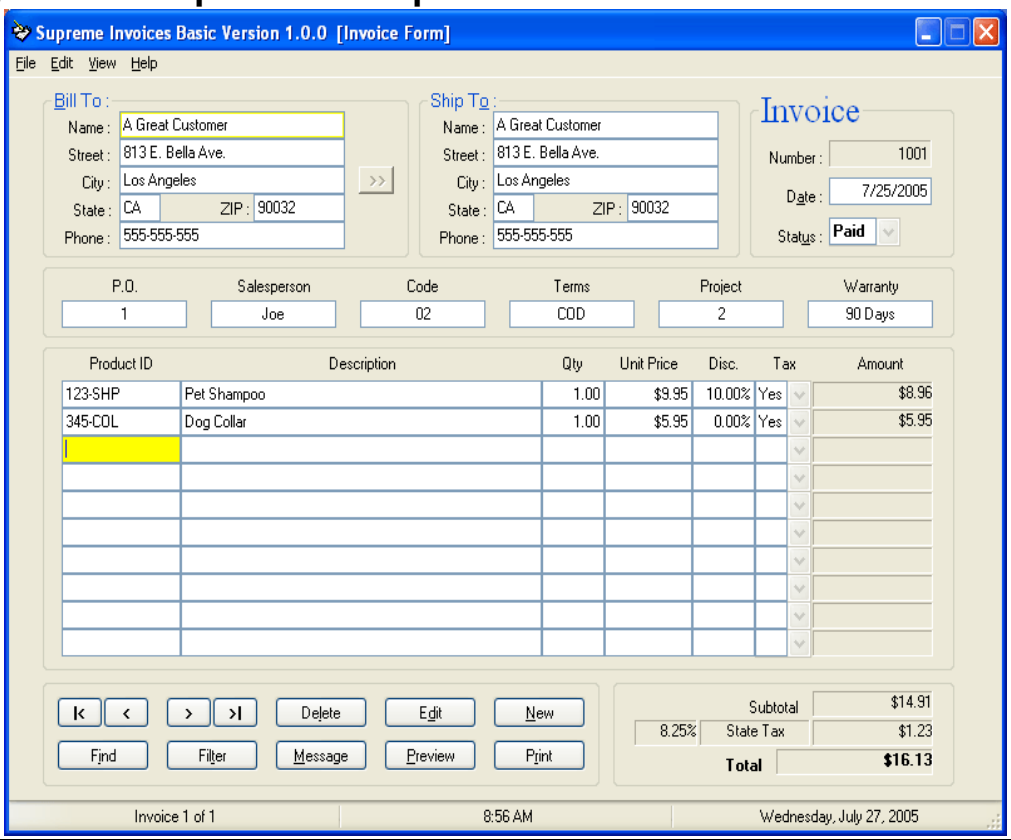
It is important to always monitor progress of a problem resolution, repair of computing equipment or devising a solution so that users may be advised of progress according to the terms of their support agreement. This needs to be done with the help of record keeping arrangements or mechanisms such as work-in-progress charts and notice-boards in the workshop.

4.4 RESOLVED AND UNRESOLVED COMPUTER USER'S PROBLEMS

4.4.1 Resolved problems

Once a user's computing device is repaired in the workshop, either within the organisation or at third parties' workshop, the device needs to be returned to the user as soon as possible. A closing procedure needs to be followed. Completion of either a report on the fault, a job-card or a log sheet needs to be done, depending on the process and procedure of the service provider. This is necessary as invoicing needs to be done based on correct and timely information flow to the accounting department. In the event that the computing device was still under a guarantee or warranty, this needs to be recorded in order to ensure proper management information. Such information is necessary for management to identify repeated breakages and unreliable suppliers of devices.

Figure - Example of a computer invoice



Note: Keep your invoice in a safe place for future purposes

The closing process also entails a report on the resolution of the problem to the user so that they may judge that the problem has been satisfactorily resolved.

All closing reporting must be done according to the organisation's agreed and approved standards and procedures. This will ensure auditability of the process and the individual repair jobs.

4.4.2 Unresolved problems

In the event that a computing device cannot be repaired it needs to be referred to the manufacturer of the device for repairs or replacement. At this stage a management decision is required regarding whether the device is economically reparable or not. This decision is reflected on the recording system such as the job-card, log sheet or fault reporting system.

The extension of the problem needs to be reported to the user involved, according to the terms of their support agreement.

Third parties also need to be advised of progress relating to the warranty, if applicable. A warranty is a collateral assurance or guarantee that certain facets of an article or service sold is as factually stated or legally implied by the seller, and that often provides for a specific remedy such as repair or replacement in the event the article or service fails to meet the warranty.

4.4.3 Updating company records

All actions must be recorded in the company's inventory system either as manual or computerised system.

The manual system uses a form to:

- Log your computer hardware serial and model numbers. Attach a copy of your vendor documentation to this document.
- Record the name of the company from which you purchased or leased this equipment and the contact name to notify for your computer repairs.
- Record the name of the company that provides repair and support for your computer hardware.

Keep one copy of this list in a secure place on your premises and another in an off-site location.

Table: Hardware inventory list

Hardware (CPU, Monitor, Printer, Keyboard, Mouse)	Hardware Size, RAM & CPU Capacity	Model Purchased	Serial Number	Date Purchased	Cost

Example of a log sheet

ACTIVITY 12 – REVIEWED – US14919 SO1,4&5

Complete this activity in your Portfolio of Evidence Workbooks.

LEARNING UNIT 5: RESOLVE TECHNICAL COMPUTER PROBLEMS

Learning outcomes to be achieved

- Troubleshoot technical computer problems, identifying possible course of action
- Provide solutions to technical computer problems, including time estimates, cost and resources
- Maintain information logs of problems identified

5. INTRODUCTION

5.1 TROUBLESHOOT TECHNICAL COMPUTER PROBLEMS, IDENTIFYING POSSIBLE COURSE OF ACTION

5.1.1 Verifies the reported symptoms and identifies any further symptoms

Whether an issue stems from a hardware or software problem, you need a reliable troubleshooting plan. Guesswork and random solutions are unreliable and often unsuccessful. An effective troubleshooting plan starts with gathering information, observing symptoms, and doing research.

Based on research in problem solving, the six steps of this troubleshooting model are as follows:

- **Discover the problem**

Identify and document problem symptoms, and search technical information resources to determine whether the problem is a known condition. Evaluate system configuration.

Review your system's history to determine what configuration changes occurred since the computer last worked correctly.

- **Track possible solutions**

Instead of using the trial-and-error approach, review Microsoft Knowledge Base articles. You can simplify troubleshooting by temporarily removing hardware and software that is not needed for starting Windows XP Professional. Consider enabling Windows XP Professional logging options to better evaluate your troubleshooting efforts.

Execute a plan.

Test potential solutions and have a contingency plan if these solutions do not work or have a negative impact on the computer. Be sure to back up critical system or application files.

- **Check results**

Determine whether your plan was successful. Have another plan in place to address unresolved issues.

- **Take a proactive approach**

Document changes that you make along the way while troubleshooting the problem. After resolving the problem, organize your notes and evaluate your experience. Think about ways to avoid or reduce the impact of the problem in the future.

Troubleshooting Concepts

The immediate goal of any troubleshooting session is to restore service as quickly as possible. However, the larger goal is to determine the cause of the problem. Root-cause analysis is the practice of searching for the source of problems to prevent them from recurring.

Problems represent deviations from known or expected behavior, and the most effective way to solve a problem is to gather information before acting and then isolate and eliminate variables.

Identify Problem Symptoms

Start by observing and identifying symptoms of the problem. You need to learn more about the circumstances in which problems occur and become familiar with system behavior when issues arise. Here are some questions that you can use to help identify symptoms:

1. Do error messages appear?

If error messages appear, record the error numbers, the exact message text, and a brief description of the activity. This information is useful when researching the cause of the problem or when consulting with technical support. In your description, include events that precede or follow a problem and the time and date of the error. For complex or lengthy messages, you can use a program such as Microsoft Paint (Mspaint.exe) to record the error message as a bitmap.

To capture an on-screen error message

1. Click the window or dialog box that contains the error message.

2. To capture the contents of the entire desktop, press PRINT SCREEN (or PrtScn).

– or –

To capture an image of the active (foreground) desktop window only, press Alt+Print Screen (or PrtScn).

3. In the Run dialog box, in the Open box, type: **mspaint**
4. On the Edit menu, click **Paste**.
5. If the prompt **"The image in the clipboard is larger..."** appears, click **Yes**.
6. On the **File** menu, type a file name for the image and then click **Save**.

Error messages might appear before Windows XP Professional starts. For example, motherboard or storage adapter firmware might display an error message if self-tests detect a hardware problem. If you are unable to record the message quickly enough, you can pause the text display by pressing PAUSE BREAK. To continue, press Ctrl+Pause Break.

Did you check Event Viewer logs?

Entries in Event Viewer's application, security, and system logs might contain information helpful for determining the cause of the problem. Look for symptoms or signs of problems that occur at frequent or regular intervals.

2. Did you check log files on your computer?

Error messages sometimes direct you to view a log file on your computer. The operating system or an application typically saves log files in text format. By using Notepad or an equivalent text editor, you can view the contents of a text log file to determine

whether it contains information useful for troubleshooting your problem.

Does the problem coincide with an application or activity?
If the problem occurs when an application is running or during activities such as network printing or Internet browsing, you can reproduce the error to observe details and gather information for troubleshooting purposes. Be sure to record what applications and features are being used when the problem occurs.

3. Do previous records exist?

Check to see whether there are records that describe changes, such as the software installed or hardware that has been upgraded. If records are not available, you might query users or other support technicians. Pay special attention to recent changes such as Service Packs applied, device drivers installed, and motherboard or peripheral firmware versions. This information can help you determine whether the problem is new or a condition that has worsened.

4. Is baseline information available?

Baseline information is system configuration and performance data taken at various times to mark hardware and software changes. If possible, compare current baselines with previous ones to determine the effects of recent changes on system performance. If previous baselines are not available, you can generate a baseline to evaluate recent efforts to troubleshoot your current system configuration.

Does the problem seem related to user profiles?

Do other users who log on to the same computer have similar problems? Are all users who do not experience problems using Administrator accounts, or do they share other common attributes? For example, check whether the problem occurs when using a newly created user account.

Compare System Settings and Configurations

If similar computers in your organisation are problem free when you are troubleshooting a problem, you can use those problem-free computers as a reference for your root-cause analysis. The properly functioning system can provide valuable baseline data. By comparing the following elements, you can speed up the process of identifying contributing causes.

Installed services and applications

Generate a list of applications and services installed on the baseline computer to compare with applications and services on the problem system. To gather a list of applications installed on your system, use **Add or Remove Programs** in Control Panel. To gather a list of services enabled on your system, use Services (Services.msc) or System Information.

Tip: Service Pack 2 for Windows XP adds a Show Updates check box to Add or Remove Programs that lets you toggle between displaying or hiding installed updates such as security updates downloaded from the Windows Update Web site.

Software revisions

Check the application and driver revisions to see whether differences exist between the two systems. Update the problem system's software to match the versions used on the problem-free system. For applications, you can usually find version information by clicking **Help** and then clicking **About** *application name*. For drivers, you can use Device Manager or System Information to find version information.

System logs

Compare Event Viewer logs for problem indications such as signs of hardware stress. For example, unexpected system shutdowns are logged with a "1076" event identification number in the System event log. The associated descriptive text can provide essential information to diagnose the problem. Baseline and problem systems might have similar problems, but the symptoms are more noticeable on one computer because it performs a unique or very demanding role. For example, a server that provides multimedia content typically consumes more system resources than a server that stores infrequently used Microsoft Word documents. Problems with disk, audio, video, or network devices and drivers typically appear earlier on computers that are stressed. Additionally, logging options for most Windows XP Professional components exist, and these can help you with features such as authentication, security, and remote access.

Hardware revisions

A minor hardware component upgrade might not be significant enough to cause a manufacturer to change a product model number. Consider the following hypothetical scenario:

A computer company uses a revision 1.0 motherboard when assembling a Model ZZXZ1234 computer. When reordering components, the company receives notice from the original equipment manufacturer (OEM) that it plans to correct certain problems by substituting updated revision 1.1 motherboards. The computer company then incorporates the updated components into all Model ZZXZ1234 computers. These minor changes might require you to exercise more care when updating drivers or firmware in your Model ZZXZ1234 computers. For example, a support Web page for Model ZZXZ1234 computers might post specific firmware versions, such as V3.0 for revision 1.0 motherboards and V4.0 for revision 1.1 and higher motherboards. Using firmware version V4.0 for computers that use revision 1.0 motherboards might cause problems.

Check Firmware Versions

When you turn on or cycle power to a computer, the central processing unit (CPU) begins to carry out programming instructions, or code, contained in the motherboard system firmware. Firmware—known as basic input/output system (BIOS) on x86-based and x64-based computers and internal adapters—contains operating system independent code necessary for the operating system to perform low-level functions such as startup self-tests and the initialization of devices required to start Windows XP Professional. If instability or setup problems affect only a few

Windows XP Professional–based computers in your organisation, check the motherboard and peripheral firmware.

Motherboard firmware revisions

Compare the BIOS version on the problem and problem-free systems. If the versions differ, check the computer manufacturer's Web site for the latest firmware revisions. For example, if your firmware revision A was stable, but upgrading to firmware revision B causes problems, you might find firmware revision C on the Web site. If no revision C exists, temporarily downgrade to revision A until an update becomes available.

Peripheral firmware revisions

It might be necessary to check peripheral firmware revisions and upgrade firmware for individual peripherals, such as Small Computer System Interface (SCSI) adapters, CD and DVD-ROM drives, hard disks, video cards, and audio devices. Peripheral firmware contains device-specific instructions, but it is independent from the operating system. Peripheral firmware enables a device to perform specific functions. Upgrading firmware can enhance performance, add new features, or correct compatibility problems. In most cases, you can upgrade device firmware by using software the manufacturer provides. Outdated motherboard system firmware can cause problems, especially for Advanced

Configuration and Power Interface (ACPI) systems.

OEMs periodically incorporate updated firmware into existing products to address customers' issues or to add new features. Sometimes similar computers using the same hardware components have different motherboard and peripheral firmware

versions. Upgrading firmware on older devices might require you to replace components (such as electronic chips) or exchange the part for a newer version. To avoid firmware problems, be sure to check the firmware revision your computer uses.

5.1.2 Use information sources to identify known problems

Troubleshooting Strategies

After you observe symptoms, check technical information sources, and review your system's history, you might be ready to test a possible solution based on the information that you have gathered. If you are unable to locate information that applies to your problem or find more than one solution that applies, try to further isolate your problem by grouping observations into different categories such as software-related symptoms (as a result of a service or application), hardware-related symptoms (by hardware types), and error messages. Prioritize your list by frequency of occurrence, and eliminate symptoms that you can attribute to user error. This enables you to methodically plan the diagnostic steps to take or to select the next solution to try.

Isolate and Resolve Hardware Problems

When troubleshooting hardware, start with and work toward the simplest configuration possible by disabling or removing devices. Then incrementally increase or decrease complexity until you isolate the problem device. In safe mode, Windows XP Professional starts with only essential drivers and is useful for diagnosing problems.

Check your hardware

If your diagnostic efforts point to a hardware problem, you can run diagnostic software available from the manufacturer. These programs run self-tests that confirm whether a piece of hardware has malfunctioned or failed and needs replacing. You can also install the device on different computers to verify that the problem is not because of system-specific configuration issues. Replacing defective hardware and diagnosing problems on a spare or test computer minimizes the impact on the user as a result of the system being unavailable. If diagnostic software shows that the hardware is working, consider upgrading or rolling back device drivers.

Reverse driver changes

If a hardware problem causes a Stop error that prevents Windows XP Professional from starting in normal mode, you can use the Last Known Good Configuration startup option. The Last Known Good Configuration enables you to recover from problems by reverting driver and registry settings to those used during the last user session. If you are able to start Windows XP Professional in normal mode after using the Last Known Good Configuration, disable the problem driver or device. Restart the computer to verify that the Stop message does not recur. If the problem persists, repeat this procedure until you isolate the hardware that is causing the problem.

Another method to recover from problems that occur after updating a device driver is to use Device Driver Roll Back in safe or normal mode. If you updated a driver since installing Windows XP Professional, you can roll back the driver to determine whether the

older driver restores stability. If another driver is not available, disable the device by using Device Manager until you are able to locate an updated driver.

Using Device Manager to disable devices is always preferable to physically removing a part because using Device Manager does not risk damage to internal components. If you cannot disable a device by using Device Manager, uninstall the device driver, turn off the system, remove the part, and restart the computer. If this improves system stability, the part might be causing or contributing to the problem and you need to reconfigure it.

Isolate and Resolve Software Issues

If you suspect that a software problem or a recent change to system settings is preventing applications or services from functioning properly, use safe mode to help diagnose the problem. You can also use the Last Known Good startup option or System Restore to undo changes made by a recently installed application, driver, or service. You can isolate issues by using the following methods.

Closing applications and processes

Close applications one at a time, and then observe the results. A problem might occur only when a specific application is running. You can use Task Manager to end applications that have stopped responding.

Temporarily disabling services

By using the Services snap-in (Services.msc) or the System Configuration Utility (Msconfig.exe), you can stop and start most

system services. For some services, you might need to restart the computer for changes to take effect.

To isolate a service-related problem, you can choose to do the following:

- Disable services one at a time until the problem disappears.

You can then enable all other services to verify that you found the cause of the problem.

- Disable all non–safe mode services and then re-enable them one at time until the problem appears.

Use the System Configuration Utility and boot logging to determine the services and drivers initialized in normal and safe mode. You can then disable all non–safe mode drivers and re-enable them one at a time until the problem returns.

Avoid Common Pitfalls

You can complicate a problem or troubleshooting process unnecessarily by acting too quickly. Avoid the following common pitfalls that can hinder your efforts:

- Not adequately identifying the problem before taking action
- Not observing the effects of diagnostic changes
- Not documenting changes while troubleshooting
- Not restoring previous settings
- Troubleshooting several problems at one time
- Using incompatible or untested hardware
- Using incompatible software

Not Identifying the Problem Adequately

If you fail to make essential observations before responding, you can miss important information in the critical moments when symptoms first appear. Here are some typical scenarios.

Failing to record information before acting

An error occurs and you start your research without recording important information such as the complete error message text and the applications running. During your research, you check technical information resources but find that you are unable to narrow the scope of your search because of insufficient information.

Restarting the computer too soon

In response to frequent random errors users experience with a certain application, you restart the affected computers without observing and recording the symptoms. Although users can resume work for the day, a call to technical support later that day is less effective because you cannot reproduce the problem. You must wait for the problem to recur before you can gather critical information needed to determine the root cause. For example, symptoms can be caused by power surges, faulty power supplies, excessive dust, or inadequate ventilation. Restarting the computer might be a temporary solution that does not prevent recurrence.

Failing to check for scheduled maintenance events or known service outages

A user comes to work early and finds that network resources or applications are not responding. You spend time troubleshooting the problem without success only to discover that both you and the

user failed to read e-mail announcing that scheduled maintenance would cause temporary early morning outages.

Assuming that past solutions always work

Prior experience can shorten the time to solve a recurring problem because you already know the remedy. However, the same solution might not always solve a problem that looks familiar. Always verify the symptoms before acting. If your initial assumptions are incorrect and you misdiagnose the problem, your actions might make the situation worse. Keep an open mind when troubleshooting. When in doubt, verify your information by searching technical information sources (including technical support) and obtain advice from experienced colleagues. Do not ignore new information, and question past procedures that seem inappropriate.

Neglecting to check the basics

A user cannot print to a new local inkjet printer. You verify cable and power connections, check the ink cartridge, and run the printer's built-in diagnostics, but you find nothing wrong. Windows XP Professional cannot detect the printer, so you manually install the most recent drivers without success. Reinstalling Windows XP Professional does not solve the problem, and you later realize that you neglected to find out whether printing to any local printer from this computer has ever been successful. You find that the user has never tried this, and a firmware check reveals that the parallel port is disabled. Enabling the parallel port resolves all printing problems.

Not Observing the Effects of Diagnostic Changes

System setting changes do not always take effect immediately. For example, when troubleshooting replication issues, you must wait to observe changes. If you do not allow adequate time to pass, you might prematurely conclude that the change was not effective. To avoid this situation, familiarize yourself with the feature that you are troubleshooting and thoroughly read the information provided by technical support before judging the effectiveness of a workaround or update.

Not Documenting Changes while Troubleshooting

Documenting the steps that you take while troubleshooting allows you to review your actions after you have resolved the problem. This is useful for very complex problems that require lengthy procedures to resolve. Documenting your steps allows you to verify that you are not duplicating or skipping steps, and it enables others to assist you with the problem. It also allows you to identify the exact steps to take if the problem recurs and enables you to evaluate the effectiveness of your efforts.

Not Restoring Previous Settings

If disabling a feature or changing a setting does not produce the results you want, restore the feature or setting before trying something else. For example, record firmware settings before changing them to diagnose problems. Not restoring settings can make it difficult to determine which of your actions resolved the problem. When verifying solutions that require you to make extensive changes or restart the computer multiple times, perform

backups before troubleshooting so that you can restore the system if your actions are ineffective or cause startup problems.

Review backup procedures

Backups are essential for all computers, from personal systems to high-availability servers. If you suspect that your troubleshooting efforts might worsen the problem or risk important data, perform a backup. This enables you to restore your system if you experience data loss, Stop errors, or other startup problems. Backups allow you to partially or completely restore the system and continue where you left off. When you evaluate or create backup procedures, consider the following:

- Use the verification option of your backup software to check that your data is correctly written to backup media.
- Routinely check the age and condition of backup media, and follow the manufacturer's recommendations for using backup media.
- Follow the hardware manufacturer's recommendations for maintaining the backup device.

Troubleshooting Several Problems at One Time

If multiple problems affect your system, avoid troubleshooting them as a group. Instead, identify shared symptoms, and then isolate and treat each separately. For example, faulty video memory can cause Stop messages, corrupted screen images, and system instability. While diagnosing the symptoms, you might find that errors occur only with multimedia applications that use advanced three-dimensional rendering. When you attempt to rule out the

possibility of failed video hardware by replacing the VGA adapter, you might find that this action also resolves the other issues.

Using Incompatible or Untested Hardware

For many organisations, standards for selecting hardware and purchasing new systems and replacement parts do not exist, are not fully defined, or are simply ignored. Standards that are well defined, refined, maintained, and followed can reduce hardware variability and optimize troubleshooting efforts.

If you need to replace hardware, record your troubleshooting actions as thoroughly as possible. Before installing a new device or replacement part, that the firmware version for the system motherboard and devices are current, and that any replacement part is pretested or “burned-in” before deployment.

Checking the Windows Catalog

Hardware problems can occur if you use devices that are not compatible with Windows XP Professional. The Windows Catalog is a Web-based searchable database of hardware and software that have been certified under the Designed for Windows XP Logo Program. The Windows Catalog outlines the hardware components that have been tested for use with Windows XP Professional and is continuously updated as additional hardware is tested and approved.

When you upgrade to Windows XP Professional, device hardware resource settings are not migrated. Instead, all devices are redetected and enumerated during installation. Typically, upgrades to Windows XP Professional follow this migration path:

- An upgrade to Windows XP Professional from Windows 98, Microsoft Windows Millennium Edition (Me), Microsoft Windows NT 4.0 Workstation, or Windows 2000 Professional.

You might find after installation that devices that functioned before the upgrade behave differently or do not work after the upgrade. This problem might have occurred because of the following reasons:

- A driver for the device is not on the Windows XP Professional operating system CD, and Device Manager lists it as unknown or conflicting hardware.
- Windows XP Professional Setup installed a generic driver that might be compatible with your device, but it does not fully support enhanced features. Many hardware manufacturers also provide tools that add value to their products, but they are not available in Windows XP Professional. Windows XP Professional Setup installs the basic feature set needed to enable your product to function. For additional software that enhances functionality or adds additional features, download the latest Windows XP Professional compatible drivers and tools from the manufacturer's Web site.

Do not attempt to re-install older drivers because doing so might cause system instability, startup problems, or Stop errors and other startup problems.

For best results, always use Designed for Windows XP certified devices. It is especially important to refer to the Windows Catalog

before purchasing modems, tape backup units, and SCSI adapters. If you must use non-certified hardware, check the manufacture's Web site for the latest updated device driver.

Note: If your system has noncertified hardware installed, uninstall drivers for these devices before installing Windows XP Professional. If you cannot complete setup, remove the hardware from your system temporarily and rerun Setup.

5.1.3 Use industry recommended procedures to identify the cause of the problem

Troubleshooting procedures are important and highly prevalent in the computer industry. They very often appear as "articles" in the KB (Knowledge Base) that comprises a core component of the support websites maintained by vendors of hardware and software products and web-based services. Help systems and manuals may also include troubleshooting procedures. Troubleshooting procedures are important in many other industries and subject areas, though they may go under different names. A first-aid manual, for example, is a set of troubleshooting procedures. My focus is troubleshoot-ing procedures in the computer industry, in particular complex troubleshooting procedures.

There is a significant, though scattered, literature pertaining to standard procedures but very little about troubleshooting procedures. They are familiar but largely unstudied.

The professional organisations that are most directly associated with this specific technical communication genre are the Association of Support Professionals and the Technology Services Industry Association (TSIA/SSPA). These organisations conduct research and disseminate information regarding both support content and real-time phone and text dialogs. But their main concerns are the business dimension of technical support and the general features of support websites and call centers. There is little attention to the specific characteristic of troubleshooting procedures.

Defining Troubleshooting Procedures

Standard procedures are task-focused. They state a user goal ("Encrypting files") and provide the steps for achieving this goal. They assume a normally functioning system and assume, not always correctly, that the user is consulting the procedure as she begins the task. In contrast, troubleshooting procedures articulate and try to solve a problem other than the user's lack of familiarity with the normal operation of the system. In most cases this problem is a bug, incompatibility, or component failure:

When I save SWF files, they save with meaningless file names and the file sizes are unusually large

EZGrab 3.0 freezes or closes unexpectedly

My computer no longer plays audio or produces any sound from the speakers or headset

This distinction between troubleshooting procedures and standard procedures requires some refinement. First, some troubleshooting

procedures (and other KB content) are written for situations in which the system is functioning normally. For example, a troubleshooting procedure may address an unexpected limitation of the product: A user cannot make something happen and thinks the product is malfunctioning, whereas the product was simply not designed to carry out this task. Second, in some cases, a user's lack of knowledge is framed as a troubleshooting problem and included in a KB: "I cannot encrypt files". This troubleshooting procedure, whose steps will closely resemble those of a standard procedure, serves the user who has gone to the KB on the assumption that a system problem is the reason she cannot encrypt her files. Finally, many standard procedures include a step or note that anticipates and addresses a minor impediment that will stymie some users

Developing Troubleshooting Procedures

Although generalizations are difficult given the size and diverse nature of the computer industry, a broad sketch of the development process provides necessary context for the analysis that follows. The development process varies greatly according to such factors as the product or service, the user assistance genre (KB, help system, support bulletin, etc.), the company (size, budget, maturity of processes), the problem category and severity, and the range of users being served. One safe generalization is that when indications of a problem first reach a company, the problem must be analyzed, a plan must be devised for a troubleshooting procedure (and possibly other responses), and the content must be created and tested.

This effort is in large part technical: For example, users who have upgraded to the newly released EZGrab 3.0--but not new purchasers of EZGrab 3.0--report that the product is saving damaged SWF files. It seems that the problem arises when users have previously saved a SWF file with certain other graphics applications. It will be necessary for the EZGrab company to determine the exact nature of this conflict and what solutions are possible--perhaps a more thorough uninstall of EZGrab 2.0, perhaps a change in the Windows Registry, perhaps downloading and installing a patched version of EZGrab 3.0. But the effort is also rhetorical: it is often a daunting challenge to create procedures that users, especially less sophisticated users, are able and willing to follow.

Because the development of troubleshooting procedures is both a technical and a rhetorical task, it is best carried out collaboratively by a range of professionals. Field reps, support technicians answering hotline calls, and forum moderators will likely have the most complete understanding of what brings on the problem, what exactly is going wrong, and what are the technical backgrounds of the various segments of the customer base. Developers are intimate with the product code. Writers and editors know how to present the information--how to encourage the user, how to reduce the effort needed to understand and follow the steps, when and how to offer users alternatives in carrying out a procedure. Finally, writers should play a central role in designing the template or model to be used as new procedures are written, a model that is optimized for the kinds of procedures the company produces most often.

5.1.4 Undiagnosed problems to be forwarded to technical expert support staff for assistance

Example: You make an appointment to see the human resources manager so that you can fix the problem. You talk to her to find out when the problem started. You ask her if anything else charged about the computer when the printer problem started. You then start to explore how your troubleshooting confirms, or verifies, the problems that the human resources manager has told you about. you try to print a document, but the document does not print, just as the manager said. So your troubleshooting verifies the symptoms that the manager reported.

ACTIVITY 13 – REVIEWED – US14938 SO1

Complete this activity in your Portfolio of Evidence Workbooks.

5.2 PROVIDE SOLUTIONS TO TECHNICAL COMPUTER PROBLEMS

5.2.1 Estimates the costs and benefits of the solution for implementing the solution

Estimating the cost of the solution can be a small task or a big one, depending on the size of the system you are working on and what needs to be replaced or repaired for the solution to be implemented. For example, downloading a new printer driver in the example in Unit one cost you very little. But if you are a computer technician for a company that runs a mainframe, it could cost thousands to replace a faulty component so, to estimate the cost of the solution, you need to know what u need to do or replace. You then need to call computer suppliers to find out what the components you need to replace cost.

5.2.1.1 Estimating the benefits of the solution

Sometimes the benefits of fixing or replacing a computer part are not that important. For example, in the case of the tourism company, suppose you were planning to replace the human resources manager's computer next week. You would have had to reinstall the printer driver onto her old computer would not been that great, because the problem would have been fixed anyway.
Sometimes, however, the problems you troubleshot can be very important that you cannot work on your computer or use a computer system without fixing them.

For example, suppose you need to type the assignment that you need to hand in, in two days time and the computer jst breaks down. You do not have access to any other computer. Then u will have to wait for that computer to be fixed.

If you have a computer or PC, it will surely help in easing most of your problems. But with every computer comes along many headaches and complications, sooner or later. A computer is a machine and every machine breaks down sometime or the other. You do not need to run to the computer technician every time your PC crashes or is attached by a malicious software. If you know some simple solutions to the most common computer problems, it will help you save a lot of time and money. There are number of common computer problems and solutions that are simple and involve glitches that can be solved by a common person like you and me in the world of computers.

There are many PC owners who think every time they face a problem with computer, they should contact professional help. True, but not every problem needs to be addressed by a computer expert. You just need to know how to fix computer problems. This article will help you recognize common problems with computer and learn about computer problems troubleshooting. The following are a few common computer problems and solutions that will help you know more on how to fix computer problems.

5.2.1.2 How to Fix Computer Problems?

Problems with computer are basically divided into two groups, i.e.,

hardware problems and software problems. The hardware problems are related to the peripheral parts of the computer like the CD drive, hard disk, monitor, keyboard, etc. You can read more in detail about computer hardware basic information related to computer hardware troubleshooting. The software problems are more complicated. These problems include problems like modem problems, Windows not starting, drivers not found, etc. The first step to fix computer problems is computer problems troubleshooting. Understand what is causing the glitch and follow the standard procedure to solve the problem. The following are a few common computer problems and solutions to help you overcome the technical snag.

Computer Problem # 1 ~ *Computer Problems after Power Outage*

Today there are many sudden power outages, voltage problems and spikes that can damage computers. These damages cause many technical and software snags and interrupt your work. This leads to loss of data, damage to the hardware, etc. due to sudden power outage. This is a common computer problem and solution to this trouble is use of uninterruptible power supply (UPS). The UPS can provide a constant flow of energy to the computer, even if you encounter a sudden power outage. This will provide you with ample time to save your data and shut down your PC, if needed.

Computer Problem # 2 ~ *Computer Performance has Slowed Down*

You may notice your computer has slowed down considerably and even a simple command execution takes ages. This is because your computer is loaded with unnecessary files, fragmented data,

corrupted registry, spyware programs, services, software, etc. that makes your computer slow down. Thus, you need to manage your programs and delete unnecessary data and software that you do not use or need, clean your registry regularly to help boost at least 30% of your computer performance speed.

Computer Problem # 3 ~ *No Sound from Speakers*
You are in the mood to listen to some groovy music on your PC, but you get no sound from speakers, the solution to is to check the back of the computer and see if all the connectors are properly connected. The speaker or single stereo speaker plug should be put into the socket on the soundcard that has a mark Audio Out.

Computer Problem # 4 ~ *Computer Monitor Displays Fuzzy Images*
A computer monitor is the display unit of the computer that is sensitive to electro-magnetic radiations. These electro-magnetic radiations are transmitted from the TV, radio, microwaves, dishwashers, washing machines, speakers, etc. Mobile phones transmit electro-magnetic radiations that is one of the main cause of monitor displaying fuzzy images. Thus, move away these disturbances away from the monitor and this problem with computer monitor will be fixed.

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Computer Problem # 5 ~ *Computer Freezes with Blue Screen Hijacking Your Display*
There are many problems that can cause your computer screen to freeze and blue screen to appear. This may be due to a spyware or computer viruses that have affected your computer. You need to

update your anti-spyware and scan your computer for any viruses. If your computer is free from any such malicious software, then you may need to update your hardware drive. A hardware drive that is not updated may cause the CPU to lock up and interrupt working of the computer. If you find the problem cropping up even after a hardware drive update, then you may need to increase computer RAM. When you increase the RAM, the computing power increases and you will also be able to avoid the computer freeze.

Computer Problem # 6 ~ *Computer Reboots Itself Again and Again*

Another one of the many common problems with computer. In order to fix computer problem of rebooting itself again and again, you will need to check the hardware. You may have a faulty power supply, defective or dirty cooling fan, etc., that may cause the computer to reboot again and again. The dust that accumulates on the fan, makes it heat up faster and in order to cool down the computer automatically switches off. Thus, clean the fan and check for power supply. Following these simple steps will help you to solve this problems with computer.

Computer Problem # 7 ~ *Computer Makes Strange Noises*

Noises and vibrations from your computer are basically a hardware problem. Many electronic parts can make high pitch noises. You need to switch off your computer and unplug it from the power supply. Now remove the case from the CPU and restart your computer. Locate the origin of noise and then switch off the computer and unplug it. It may be a faulty fan, loose wire or screw. This means you will need to call the computer technician to help

you solve your problems with computer, regarding these type of problems.

Computer Problem # 8 ~ *Windows Having Problems in Shutting Down Properly* you may have come across the message 'Windows Shutting Down' instead of 'It is now safe to switch off you computer'. This is because a program has not unloaded itself properly that makes the computer insist to run a scandisk the next time you switch on.

You need to close all the programs before your shut down your PC and if it is not done, the computer waits for the program to close. It may happen you get the message 'Do you want to shut this program down or wait' or you may not. When you don't get such a message it results in what we call the hanging of the operating system. The solution is not to install Direct X whenever you install a game. Most games have their version of Direct X that makes the files out of sync. Thus, install the latest version of Direct X and not the games version. You may need to also check USB devices, task schedulers, virus scanners, etc. and reinstall them if necessary. This will lead to correct installation and the problems with computer may reduce.

5.2.2 Describes the solution so that a judgement can be made about the feasibility and effectiveness of the solution

The feasibility and effectiveness of a solution

When we looked at the costs and benefits of a solution in the previous section, and also the feasibility and effectiveness of the solution.

5.2.2.1 Outlining the feasibility of a solution

A solution will not be feasible if, for example, its costs outweigh its benefits. What does this mean? Well if u have to pay a lot of money for a few benefits, the solution is not feasible. In other words, the solution milestones to help you to make sure that the solution is implemented in time.

How does planned provision estimate time?

As you have probably realised from the examples it takes far less time to download a printer driver from the internet than to replace a mainframe component. To make the solution to a technical problem feasible, you need to be able to estimate quite accurately how long it will take to fix. Suppose that you tell the human resource manager that her printer will be fixed by lunchtime. She arranges the work that she has to do that day so that she will print out the personal information of the employees after lunch, when her printer is fixed. However, it turns out taking you the whole afternoon to download drivers. As a result, the human resource manager is not able to use the printer that day.

When you plan to implement a solution to a technical problem, you need to estimate the amount of time it will take to implement the solution as accurately as possible.

How does planned provision estimate resources?

The type of resources you need to provide solutions to technical problems depends on the type of problem you have to fix . For example, downloading a printer driver needs very few resources. It only takes a few minutes of the technician's time and a small amount of bandwidth. However, replacing a mainframe part requires a lot of money, quite a bit of time, as well as many skills and resources, such as tools and antistatic wrist straps for everybody working on the repair. Before you start implementing a solution to a technical problem, you need to make sure that all the required resources are available.

5.2.3 Plan for implementing the solution

How does planned provision estimate specified milestones?

When one estimate milestones, you make sure that certain events in the process happen at certain times. For example, when technicians who administer web servers do maintenance or repairs to the servers, they make sure that they work on the servers in the middle of the night when very few people are using the servers to access information over the internet. To make sure that the servers are running by the morning the technicians need to estimate milestones.

Maintaining information logs

You can think of information as the diary of a computer. The information log is a record of problems that is stored in a way that you can easily find information about the problems. You can use

this logs to see exactly which problems have happened on the computer. Because the logs are all stored in a database of logs, you can create reports that summarise the types of problems the computer has experienced. You can also use logs to see how bad the problems were.

How does information log maintenance identify sources of information?

When you maintain information logs, you can access the volume of occurrences. The volume of occurrences is the number of events that has happened on the computer. By viewing the volume of occurrences, you can learn about the different events on the computer.

When technicians know how many events have happened, they can track trends in the issues and errors to also sort the events by department, computer, user, software profile and hardware profile. For example, technicians can use the information logs to see that the accounts department in particular business reported 13 critical software problems last month, they can compare this to the sales department, for example that they had just two minor issues. This information tells technicians that the accounting software, which is not used by the sales department, is probably causing the major of the problems.

Why is information log maintenance necessary?

Technicians use logs maintenance to see patterns in how computers behave. They analyse the information log to see where the system has a problems. They then use that information to improve the system.

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5.3 MAINTAIN LOGS OF PROBLEMS IDENTIFIED

5.3.1 Information logs are maintained in a recording system for problems and solutions

Information log is a record of the events occurring within an organisation's systems and networks. Logs are composed of log entries; each entry contains information related to a specific event that has occurred within a system or network. Many logs within an organisation contain records related to computer security. These computer security logs are generated by many sources, including security software, such as antivirus software, firewalls, and intrusion detection and prevention systems; operating systems on servers, workstations, and networking equipment; and applications.

The number, volume, and variety of computer security logs have increased greatly, which has created the need for computer security log management—the process for generating, transmitting, storing, analyzing, and disposing of computer security log data. Log management is essential to ensuring that computer security records are stored in sufficient detail for an appropriate

period of time. Routine log analysis is beneficial for identifying security incidents, policy violations, fraudulent activity, and operational problems. Logs are also useful when performing auditing and forensic analysis, supporting internal investigations, establishing baselines, and identifying operational trends and long-term problems.

Compare Event Viewer logs for problem indications such as signs of hardware stress. For example, unexpected system shutdowns are logged with a “1076” event identification number in the System event log. The associated descriptive text can provide essential information to diagnose the problem. Baseline and problem systems might have similar problems, but the symptoms are more noticeable on one computer because it performs a unique or very demanding role. For example, a server that provides multimedia content typically consumes more system resources than a server that stores infrequently used Microsoft Word documents. Problems with disk, audio, video, or network devices and drivers typically appear earlier on computers that are stressed. Additionally, logging options for most Windows XP Professional components exist, and these can help you with features such as authentication, security, and remote access.

5.3.1.1 Organisations should establish policies and procedures for log management

To establish and maintain successful log management activities, an organisation should develop standard processes for performing

log management. As part of the planning process, an organisation should define its logging requirements and goals. Based on those, an organisation should then develop policies that clearly define mandatory requirements and suggested recommendations for log management activities, including log generation, transmission, storage, analysis, and disposal. An organisation should also ensure that related policies and procedures incorporate and support the log management requirements and recommendations. The organisation's management should provide the necessary support for the efforts involving log management planning, policy, and procedures development.

5.3.2 Information log maintenance identifies sources for occurrence volumes for problems and solution

A fundamental problem with log management that occurs in many organisations is effectively balancing a limited quantity of log management resources with a continuous supply of log data. Log generation and storage can be complicated by several factors, including a high number of log sources; inconsistent log content, formats, and timestamps among sources; and increasingly large volumes of log data. Log management also involves protecting the confidentiality, integrity, and availability of logs. Another problem with log management is ensuring that security, system, and network administrators regularly perform effective analysis of log data. This publication provides guidance for meeting these log management challenges.

5.3.2.1 Organisations should prioritize log management appropriately throughout the organisation.

After an organisation defines its requirements and goals for the log management process, it should then prioritize the requirements and goals based on the organisation's perceived reduction of risk and the expected time and resources needed to perform log management functions. An organisation should also define roles and responsibilities for log management for key personnel throughout the organisation, including establishing log management duties at both the individual system level and the log management infrastructure level.

5.3.2.2 Organisations should create and maintain a log management infrastructure.

A log management infrastructure consists of the hardware, software, networks, and media used to generate, transmit, store, analyze, and dispose of log data. Log management infrastructures typically perform several functions that support the analysis and security of log data. After establishing an initial log management policy and identifying roles and responsibilities, an organisation should next develop one or more log management infrastructures that effectively support the policy and roles.

Organisations should consider implementing log management infrastructures that includes centralized log servers and log data storage. When designing infrastructures, organisations should plan for both the current and future needs of the infrastructures and the individual log sources throughout the organisation. Major factors to consider in the design include the volume of log data to be

processed, network bandwidth, online and offline data storage, the security requirements for the data, and the time and resources needed for staff to analyze the logs.

5.3.3 Information log maintenance identifies sources for new information and trends for future reference

Organisations should provide proper support for all staff with log management responsibilities

To ensure that log management for individual systems is performed effectively throughout the organisation, the administrators of those systems should receive adequate support. This should include disseminating information, providing training, designating points of contact to answer questions, providing specific technical guidance, and making tools and documentation available.

Organisations should establish standard log management operational processes.

The major log management operational processes typically include configuring log sources, performing log analysis, initiating responses to identified events, and managing long-term storage. Administrators have other responsibilities as well, such as the following:

- Monitoring the logging status of all log sources
- Monitoring log rotation and archival processes
- Checking for upgrades and patches to logging software, and acquiring, testing, and deploying them

- Ensuring that each logging host's clock is synched to a common time source
- Reconfiguring logging as needed based on policy changes, technology changes, and other factors
- Documenting and reporting anomalies in log settings, configurations, and processes.

5.3.4 Information logs as sources of information for future reference of technical support

Technical support or **tech support** refers to a range of services by which enterprises provide assistance to users of technology products such as mobile phones, televisions, computers, software products or other electronic or mechanical goods. In general, technical support services attempt to help the user solve specific problems with a product—rather than providing training, customization, or other support services

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RESOURCES

http://www.buzzle.com/articles/computer-problems-and-solutions.html
http://books.google.com/books?id=l5iUnVhVPa4C&pg=PA228&lpg=PA228&dq=SOLUTIONS+TO+TECHNICAL+COMPUTER+PROBLEMS
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