

# Chapter 4: Basics of Preventive Maintenance and Troubleshooting



## IT Essentials: PC Hardware and Software v4.1

# Chapter 4 Objectives

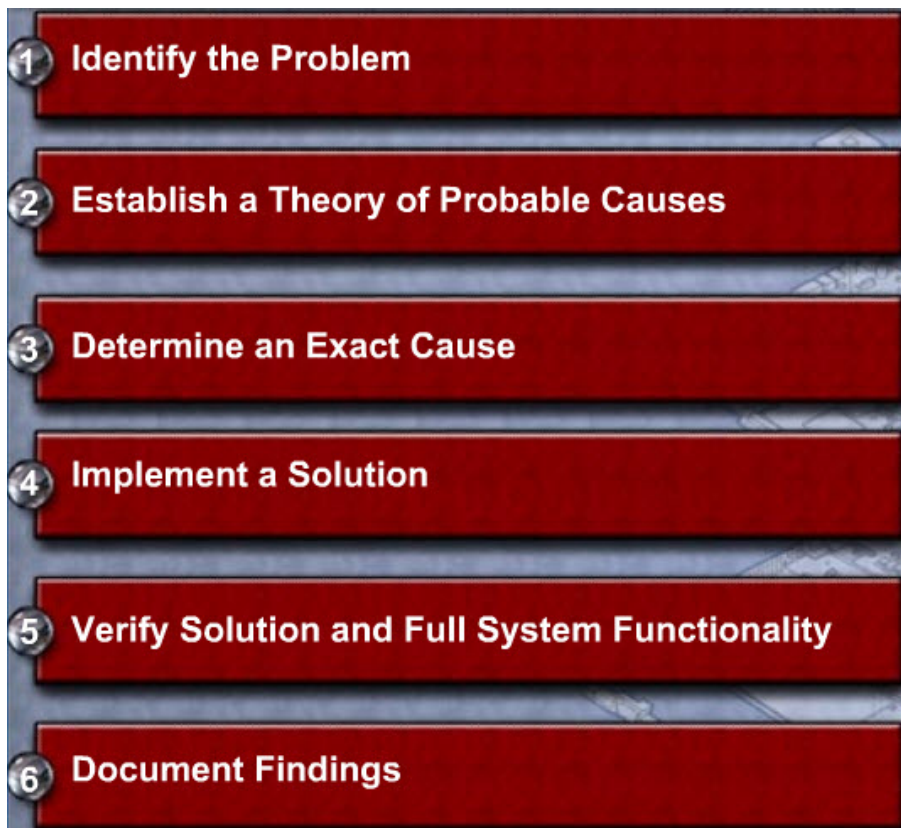
- 4.1 Explain the purpose of preventive maintenance
- 4.2 Identify the steps of the troubleshooting process



# The Purpose of Preventive Maintenance

- Reduce the likelihood of hardware or software problems by systematically and periodically checking hardware and software to ensure proper operation.
- Preventive Maintenance can be divided in:
  - Hardware maintenance
  - Software maintenance
- Benefits of preventive maintenance are:
  - Reduced computer down time and repair costs.
  - Increased data protection
  - Extended life of the components
  - Increased equipment stability

# The Troubleshooting Process



- Follow an organized and logical procedure.
- Eliminate variables one at a time.
- Troubleshooting is a skill that is refined over time.
- The first and last steps involve effectively communicating with the customer.

# Data Protection

- Before troubleshooting problems, **always** follow the necessary precautions to protect data on a computer.
- If you are unsure that a backup has been done, do not attempt any troubleshooting activities until you check with the customer:
  - Date of the last backup
  - Contents of the backup
  - Data integrity of the backup
  - Availability of all backup media for data restore
- If no backup can be created, ask customer to sign a **release form**.



# Troubleshooting Process Steps

## Step 1 - Identify the problem

- During the troubleshooting process, gather as much information from the customer as possible, but **always respectfully**.
- Use the following strategy during this step:
  1. Start by using **open-ended questions** to obtain general information.
  2. Continue using **closed-ended (yes/no) questions** to get relevant information.
  3. Then **document the responses** in the work order and in the repair journal.
  4. And last, **verify** the customer's description by gathering **data from the computer** by using applications such as:
    - Event Viewer
    - Device Manager
    - Beep Codes
    - BIOS Information
    - Diagnostic Tools

# Troubleshooting Process Steps

## Step 2 - Establish a theory of probable causes

- Create a list of the most common reasons why the error would occur.
- List the easiest or most obvious causes at the top with the more complex causes at the bottom.

## Step 3 – Determine an exact cause

- Determine the exact cause by testing the theories of probable causes one at a time, starting with the quickest and easiest.
- After identifying an exact cause of the problem, determine the steps to resolve the problem.
- If the exact cause of the problem has not been determined after you have tested all your theories, establish a new theory of probable causes and test it.

# Troubleshooting Process Steps

## Step 4 – Implement the solution

- Sometimes quick procedures can determine the exact cause of the problem or even correct the problem. If it does, you can go to step 5.
- If a quick procedure does not correct the problem, you might need to research the problem further to establish the exact cause.
- Divide larger problems into smaller problems that can be analyzed and solved individually.



# Troubleshooting Process Steps

## Step 5 – Verify solution and full system functionality

- Verify full system functionality and implement any preventive measures if needed.
- Ensures that you have not created another problem while repairing the computer.

## Step 6 – Document findings

- Discuss the solution with the customer.
- Have the customer confirm that the problem has been solved.
- Document the process:
  - Problem description
  - Steps to resolve the problem
  - Components used in the repair

## Chapter 4 Summary

- Regular preventive maintenance reduces hardware and software problems.
- Before beginning any repair, back up the data on a computer.
- The troubleshooting process is a guideline to help you solve computer problems in an efficient manner.
- Document everything that you try, even if it fails. The documentation that you create will become a useful resource for you and other technicians.

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