Chapter 4: Overview of Preventive Maintenance

IT Essentials 5.0

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Chapter 4 Objectives

- 4.1 Explain the purpose and benefits of preventive maintenance.
- 4.2 Identify and implement the steps of the troubleshooting process.

The Purpose of Preventive Maintenance

- **Reduce the possibility of hardware or software problems by implementing a preventive Maintenance Plan based on at least two factors:**
  - Computer location
  - Computer use
- **Benefits of Preventive Maintenance are:**
  - Reduced computer down time and repair costs.
  - Increased data protection.
  - Extended life of the components.
  - Increased equipment stability.
- **Preventive Maintenance can be divided into:**
  - Hardware maintenance
  - Software maintenance

Preventive Maintenance Tasks

- **Hardware Maintenance**
  - Check the condition of cables, components, and peripherals.
  - Repair or replace any components that show signs of excess wear.
  - Keep components clean to reduce the likelihood of overheating.
- **Software Maintenance**
  - Verify current version.
  - Review security, software, and driver updates.
  - Update virus definition files.
  - Scan for viruses and spyware.
  - Remove unwanted programs.
  - Scan hard drives for errors.
  - Defragment hard drives.

The Troubleshooting Process

Step	Troubleshooting Process
1	Identify the Problem
2	Establish a Theory of Probable Cause
3	Test the Theory to Determine Cause
4	Establish a Plan of Action to Resolve the Problem and Implement the Solution
5	Verify Full System Functionality and, if Applicable, Implement Preventive Measures
6	Document Findings, Actions, and Outcomes

- 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 unsure that a backup has been done, do not attempt any troubleshooting activities until the following are verified:
  - 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 be respectful**.
- 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. **Document the responses** in the work order and in the repair journal.
  4. **Verify** the customer's description by gathering **data from the computer** using applications such as:
     - Event Viewer
     - Device Manager
     - Beep Codes
     - BIOS Information
     - Diagnostic Tools

Troubleshooting Process Steps

Step 2 - Establish a theory of probable cause

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

Step 3 – Test the Theory to Determine cause

- Determine the exact cause by testing the theories of probable cause 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 all theories have been tested, establish a new theory of probable causes and test it.

Troubleshooting Process Steps

Step 4 – Establish a Plan of Action to Resolve the Problem and Implement the solution

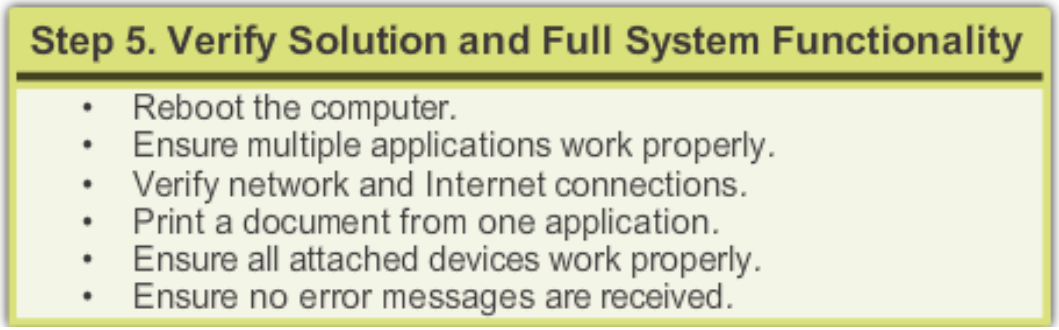
After the exact cause of the problem is determined, establish a plan of action to resolve the problem and implement the solution.

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

Troubleshooting Process Steps

Step 5 – Verify Full System Functionality and, If Applicable, Implement Preventive Measures

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



Troubleshooting Process Steps

Step 6 – Document Findings, Actions, and Outcomes

- 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

PC Common Problems and Solutions

- **Storage device problems** - loose or incorrect cable connections, incorrect drive and media formats, and incorrect jumper and BIOS settings.
- **Motherboard and internal component problems** - incorrect or loose cables, failed components, incorrect drivers, and corrupted updates.
- **Power supply problems** - faulty power supply, loose connections, and inadequate wattage.
- **CPU and memory problems** - faulty installations, incorrect BIOS settings, inadequate cooling and ventilation, and compatibility issues.

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 solve computer problems in a logical and efficient manner.
- Document every solution that is tried, even if it fails. The documentation that is created will become a useful resource.