



Chapter 4: Overview of Preventive Maintenance



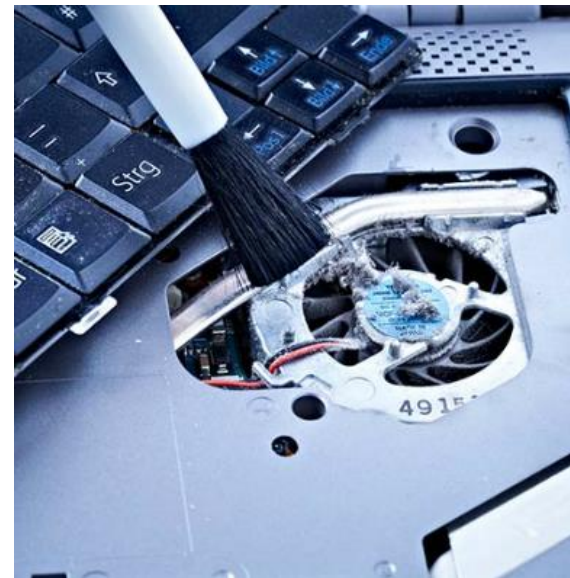
IT Essentials 5.0

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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.

Step 5. Verify Solution and Full System Functionality

- Reboot the computer.
- Ensure multiple applications work properly.
- Verify network and Internet connections.
- Print a document from one application.
- Ensure all attached devices work properly.
- Ensure no error messages are received.



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.

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