Unit 15:  Installing and Maintaining Computer Software

Level:  1 and 2
Unit type:  Optional specialist
Guided learning hours:  60
Assessment type:  Internal

Unit introduction

Computer software brings technology systems to life and is the main way we control and communicate with systems. Types of software include the operating system (OS), which supports the communication and management of resources, and application software, such as office programs and graphics packages designed to help the user perform specific tasks.

Over time it is necessary to install and maintain software in a system. This includes customising software applications to improve productivity, for instance to create new menus and keyboard short cuts. Job roles that require installing and maintaining computer software include computer technician, technical support engineer, service team leader, and helpdesk engineer.

In this unit, you will develop an understanding of the benefits and implications of installing and maintaining software in technology systems. As specified in a brief, you will learn how to install and maintain software in a technology system. This will involve installing and upgrading an operating system and different software applications, such as office or multimedia programs.

You will also customise different components of software applications to improve productivity, for example to create new toolbars and automate a range of tasks using a macro. The technology system will be tested for functionality, usability and productivity. Once completed, you will review your modified technology system against the brief and obtain feedback from the ‘client’, having obtained feedback from others, and evaluate possible improvements.

In particular, this unit develops skills from Unit 2: Technology Systems, Unit 9: Spreadsheet Development, Unit 8: Mobile Apps Development, Unit 12: Software Development, and supports Unit 11: Computer Networks and Unit 14: Installing and Maintaining Computer Hardware.

Learning aims

In this unit you will:
A understand the benefits and implications of installing and maintaining software in technology systems
B plan installation and maintenance of software in a technology system
C install, maintain and test software in a technology system
D review the modified technology system.
# Learning aims and unit content

<table>
<thead>
<tr>
<th>What needs to be learnt</th>
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<tr>
<td><strong>Learning aim A:</strong> Understand the benefits and implications of installing and maintaining software in technology systems</td>
</tr>
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</table>

## Computer software

Types of software, e.g.:
- software applications (computer programs such as word processing, spreadsheets, databases, email)
- system software (such as operating systems, system utilities, network utilities, device drivers)
- programming software (such as compilers, interpreters, integrated development environments).

## Why we install and maintain computer software

Reasons to install and maintain computer software, e.g.:
- to keep up to date with modern technologies
- to customise different components of software applications to meet users’ needs
- to prevent software problems occurring and/or to repair software problems
- to upgrade software (such as office applications, operating systems, device drivers)
- to change system functionality (such as media centre, network, other specialist purposes).

## Benefits and implications of installing and maintaining software

**Benefits:**
- to reduce costs
- to improve productivity, e.g. configuration and customisation, specialist tools, time saving, error reduction, improved user perception
- for customisation, e.g.:
  - speed (reducing key strokes)
  - accuracy (control data entry)
  - ease of use
  - style consistency (standardised templates)
- to improve performance, e.g. efficiency and effectiveness
- to improve user experience
- to improve communication
- to improve/maintain customer service
- to apply software updates made available by manufacturer
- to improve security or stability, e.g. piloting software to evaluate how it integrates with current technology systems.
**What needs to be learnt**

Implications, e.g.:
- training requirements
- compatibility issues
- decommissioning
- service level agreements
- increase in complexity
- support needs
- costs and licensing, including copyright
- software issues, such as a new release of software can often present unforeseen faults (bugs) that are usually repaired through later software updates
- risks:
  - data risk (such as data loss, data corruption)
  - other risks (such as service loss)
- issues of software piracy
- registration.

How installing and maintaining computer software could improve the productivity for an individual or organisation, e.g.:
- updating the operating system will ensure that any new software applications are compatible with the latest standards
- customising a spreadsheet using macros to automate calculations and functions will result in saved time and improved efficiency.
What needs to be learnt

Learning aim B: Plan installation and maintenance of software in a technology system

Planning to install and maintain software
Plan to include:

- purpose of the installation or upgrade, e.g. compatibility, change in system functionality, upgrade, improve productivity (performance, speed, reliability)
- requirements of the brief (‘client’/user requirements)
- alternative ideas for installing and maintaining software, e.g. there will be more than one system software or software application available that will contain the same features and perform the same function
- tasks/activities, e.g. install or upgrade an operating system, customise a spreadsheet to suit user’s requirements, install or upgrade an office application, install software updates to the operating system
- software resources required, such as:
  - software applications, e.g.:
    - office applications, e.g. word processors, spreadsheets, databases, desktop publishing, email, web browsers
    - bespoke applications, e.g. custom-built specialist software designed for a specific purpose
  - system software, e.g.:
    - operating systems, e.g. open source, Windows-based, Mac-based
    - utility software, e.g. antivirus, home protection, security, data and system backup and restoration, defragmenter
    - software drivers, e.g. new hardware device installation
  - tools, e.g.
    - installation disks
    - operating instructions
    - registration information
    - software licence/product keys, e.g. creative commons, single or multi-user licence
- constraints (costs and technical), e.g. software costs/licensing, software availability, tools
- test/troubleshoot plan to test functionality and usability.
**What needs to be learnt**

**Learning aim C: Install, maintain and test software in a technology system**

**Install and maintain software in a technology system**

**Preparation, e.g.:**
- read manufacturer’s software instructions
- test selection and configuration
- obtain resources, e.g. access rights, software installation resources and tools
- determine software installation source, e.g. media type, internet-based, synchronisation application, critical update from software provider
- check compatibility, e.g. software specification, storage requirements, technology system requirements, user requirements
- other tasks, e.g. backing up data, setting restore points, uninstalling existing software, software licence keys
- establish configuration, e.g. setting correct date/time, language settings, network and establish customisation, e.g. toolbars, menus, shortcuts, other user preferences.

**Installation and maintenance activities**

**Process, e.g.:**
- identify software and purpose, (operating system software, software applications, bespoke software applications, utility software)
- download or gather software resources
- carry out pre-installation and post-installation checks
- back up data and system settings
- set restore points
- customise software applications
- system test
- dispose of/recycle packaging
- other tasks, e.g. restore data and system settings.

**Customisation**

**Tools and techniques, e.g.:**
- creating or changing components, e.g.:
  - default settings
  - menus
  - toolbars
  - templates
  - shortcuts
  - forms
  - macros.

Feedback from client, e.g. functionality, usability, productivity.

Refinements to the technology system to improve productivity, e.g. customising software applications by creating macros and forms.

Potential improvements to the technology system, e.g. performance, accessibility, reliability, security, ‘client’ requirements.
What needs to be learnt

Learning aim D: Review the modified technology system

Review the finished software installation against:
- original client and user requirements
- purpose
- suitability of choice of software resources
- any special requirements
- constraints.
### Assessment criteria

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2 Pass</th>
<th>Level 2 Merit</th>
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<tbody>
<tr>
<td><strong>Learning aim A: Understand the benefits and implications of installing and maintaining software in technology systems</strong></td>
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<tr>
<td>1A.1 Identify the benefits of installing and maintaining software for two different technology systems.</td>
<td>2A.P1 Explain the benefits of installing and maintaining software for two different technology systems.</td>
<td>2A.M1 Review how installing and maintaining software in one technology system could improve productivity for an individual or organisation.</td>
<td>2A.D1 Discuss the strengths and weaknesses of software for a given technology system.</td>
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<td><strong>Learning aim B: Plan installation and maintenance of software in a technology system</strong></td>
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<tr>
<td><strong>1B.2</strong> Identify the purpose and ‘client’ requirements for installing and maintaining software in a technology system.</td>
<td><strong>2B.P2</strong> Describe the purpose and ‘client’ requirements for installing and maintaining software in a technology system.</td>
<td><strong>2B.M2</strong> Produce a detailed plan including reasons why alternative ideas for installing and maintaining software have been discarded.</td>
<td><strong>2B.D2</strong> Justify final decisions, explaining how the technology system will fulfil the stated purpose and ‘client’ requirements, describing the impact of any constraints on the plan.</td>
</tr>
</tbody>
</table>
| **1B.3** Produce a plan for installing and maintaining software in a technology system, with guidance, including:  
  - a list of installation and maintenance activities  
  - a list of software resources required for an installation or upgrade. | **2B.P3** Produce a plan for installing and maintaining software in a technology system including:  
  - a list of installation and maintenance activities  
  - a description of software resources required for an installation or upgrade  
  - a description of customisation tools and techniques  
  - a test plan. | | |
## Level 1

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<th>Learning aim C: Install, maintain and test software in a technology system</th>
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<td>1C.4 Install and maintain software in a technology system, with guidance, that includes the:</td>
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<td>● installation or upgrade of at least one different software application(s)</td>
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<td>1C.5 Test the modified technology system for functionality and repair any faults, with guidance.</td>
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## Level 2

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<tr>
<td>2C.6 Install and maintain software in a technology system in order to improve productivity, taking account of feedback.</td>
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<tr>
<td>2C.6 Install and maintain software in a technology system, using appropriate tools and techniques to protect the data and system settings, demonstrating awareness of the user requirements and taking account of usability.</td>
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<td>2C.P4 Install and maintain software in a technology system that includes the:</td>
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<td>2C.P5 Test the modified technology system for functionality against the purpose, and repair any faults as necessary.</td>
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<tr>
<td>2C.M4 Test the modified technology system, gather feedback, and use it to improve the technology system for functionality, productivity and user experience.</td>
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<tr>
<td>2C.M3 Install and maintain software in a technology system, using appropriate tools and techniques to protect the data and system settings, demonstrating awareness of the user requirements and taking account of usability.</td>
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<tr>
<td>2C.D3 Refine the modified technology system in order to improve productivity, taking account of feedback.</td>
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<td>2C.P5 Test the modified technology system for functionality against the purpose, and repair any faults as necessary.</td>
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## Level 2 Merit

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## Level 2 Pass

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### Learning Aim D: Review the modified technology system

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<td>1D.6</td>
<td>For the modified technology system, identify how it is suitable for the intended purpose and original requirements.</td>
<td>2D.P6 Explain how the modified technology system is suitable for the intended original requirements and purpose.</td>
<td>2D.M5 Review the extent to which the modified technology system meets the original requirements while considering feedback from others and the effect of any constraints.</td>
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</table>
Teacher guidance

Resources
As a minimum, each learner will need access to a technology system that will allow them to install, upgrade, maintain and customise software to meet a brief.
Learners will need:
● operating system software, e.g. open source, Windows-based, Mac-based
● at least two different software applications capable of customisation, e.g. office software, media software.

It is important that software resources are accompanied by the relevant manuals, installation disks (or software package downloaded in advance from the manufacturer’s website), software licence/products keys, and any registration information.
The practical activities should take place with appropriate resources and tools.
It is recommended that free resources are obtained for the practical activities.
Learners need access to a brief. The brief can either be created by the centre or be generated by the learner and approved by the centre.

Assessment guidance
This unit is assessed internally by the centre and externally verified by Pearson. Please read this guidance in conjunction with Section 8 Internal assessment.

Learning aim A
Learners will investigate and understand the computer software in two different technology systems, explaining the benefits and implications of installation and maintenance.

For 2A.P1: learners should explain the benefits and implications of installing and maintaining computer software in two different technology systems. For example, a benefit would include staying up to date with the latest security software to capture and quarantine new viruses. An implication may include the prohibitive costs of some software licences.

For level 1, as a minimum, learners should identify the benefits of installing and maintaining the software in two different technology systems. They are likely to have listed only two examples, without any description.

For 2A.M1: learners should review how installing and maintaining the software in one technology system could improve productivity for an individual or organisation. For example, customising a spreadsheet using a macro could save time and improve efficiency for an organisation by automating calculations and function.

For 2A.D1: learners should discuss the strengths and weaknesses of software for a given technology system. For example, one weakness of software is that it could be reliant on specialised hardware attached to the technology system. Learners should discuss at least one strength and at least one weakness.

Learning aim B
Learners will establish the requirements for installing and maintaining software in a technology system, based on a brief. The brief should allow learners to explore different possibilities for fulfilling the requirements. It should also allow them to produce a plan of their ideas for installing and/or upgrading system software and software applications, as well as for customising software applications for a given...
purpose. Ideally, the brief should be written with a ‘client’ in mind, with clearly stated resource requirements and objectives.

The brief must include the following requirements (as a minimum):

- the reason (purpose) for a change to the software in a technology system and user/‘client’ requirements
- an outline of the technology system that requires an installation or upgrade of an operating system
- an outline of at least two different computer enhancements that would require an installation or upgrade of software applications, e.g. to upgrade existing office software to take advantage of new features and to keep office documents consistent for all users
- an outline of at least three different components of one or more software applications that could be customised to meet a given purpose, e.g. creating a new menu in an office program that displays a list of user’s most-used functions
- an outline of any refinements that would require macros and/or forms to be created as part of customising a software application, e.g. a macro to automate a calculation task in a spreadsheet
- any special requirements/instructions/configuration
- timeframe
- budget (costs)
- constraints.

Centres are encouraged to use evidence for the installation and maintenance of the technology system as part of the learner’s digital portfolio (Unit 3: A Digital Portfolio).

For 2B.P2: in order to produce a plan for the installation and maintenance of software in a technology system, learners must first be able to understand and interpret the requirements from the brief. Learners should be able to provide a description of the purpose and ‘client’ requirements for installing and maintaining software in a technology system.

If the technology system is to be upgraded or customised, learners will need to investigate it to get an idea of its current state and what it is capable of doing.

For level 1, as a minimum, learners will identify the ‘client’ requirements and purpose for installing and maintaining software in a technology system.

For 2B.P3: learners will plan the installation and maintenance of software in a technology system.

They should include:

- a list of installation and maintenance activities
- a description of software resources required for the installation or upgrade
- a description of the customisation tools and techniques needed to meet the ‘client’ requirements.

They should also provide a test plan to cover the installation and maintenance (including customisation) of software in a technology system, giving an outline of the range of tests that they will perform once the system is modified.

For level 1, as a minimum, learners should produce, with guidance, a plan for the installation and maintenance of software in a technology system. An outline plan should contain a list of installation and maintenance activities to be carried out, and a list of software resources needed for the installation or upgrade.
For 2B.M2: learners should consider alternative ideas for installing and maintaining software within their plan. For example, in a scenario where the technology system is intended to be used for working with digital images, there are different graphics and artwork packages available that users can use to achieve the same purpose. Learners should consider the distinctive features and benefits of different types of software when suggesting ideas in their plan.

For 2B.D2: learners should justify decisions in their plan, explaining why they have chosen different software resources and customisation tools and techniques while rejecting others, making reference to the given purpose and the ‘client’ requirements. Learners must also think about constraints, for example the availability of tools and software, and whether or not this will have an impact on maintaining the software in a technology system. If it does, are there any alternatives for modifying the system to meet the same requirements? For example, if the ‘client’ requires an operating system but there is no budget for purchasing a new operating system, it would be sufficient to obtain an open-source operating system from the internet and install this, to meet the same requirements.

Learning aim C

Learners will install and maintain software in a technology system. They should apply their practical skills and knowledge to do this.

For 2C.P4: learners should use appropriate resources and customisation tools and techniques (as identified in their plan) to install and maintain the software in a technology system.

As a minimum, learners should have installed or upgraded and appropriately configured an operating system. They should have also installed or upgraded at least two different software applications, for example an office program or a multimedia program, as well as customised at least three different components of any installed software applications, for example create a new menu, change a toolbar or create a keyboard shortcut.

For level 1, as a minimum, learners should install or upgrade at least one software application and customise at least two different components in one or more software applications, with guidance. It is assumed that learners will be provided with a technology system that already has an operating system installed.

For 2C.M3: learners should demonstrate good practice to protect data and system settings when maintaining software in a technology system. Learners should use appropriate tools and techniques to safely back up data prior to making any modifications to the technology system. They should also safely restore the data and system settings to the technology system after the modifications are complete. The modified technology system must demonstrate the learner’s awareness of the user requirements and improve the usability of the systems.

For 2C.P5: learners will be expected to follow their test plans (as identified in their plan) and test for functionality and purpose against the original requirements.

Learners are likely to experience technical difficulties as they install and maintain the software in a technology system. Where this happens, learners are expected to troubleshoot and resolve these difficulties, finding and resolving any software problems. It is important that learners make appropriate comments in their plans and test plans with regard to any problems they discover and how they have resolved them. Where appropriate to do so, it is acceptable to photograph or take screenshots of problems and solutions or use witness statements and observation records as evidence of this process.

For level 1, as a minimum, learners should test their system and repair any faults, with guidance.
For 2C.M4: learners are required to test the usability of the technology system while ensuring that data is safely backed up and system settings can be restored. Learners will complete user-experience testing, with the help of at least one person who can act as the ‘client’. The ‘client’ should be commenting on the functionality and usability of the modified technology system. Learners should record this feedback as part of the testing process.

For 2C.D3: teachers should recognise that the process of installing, maintaining and testing software in technology systems is an iterative process. Learners should refine the modified technology system to improve productivity. Learners are also expected to make further refinements based on their test results and feedback. This must include customising software applications by either creating a macro or by creating a form for a given purpose. For example, they might create a new macro in a spreadsheet that will automate calculations and functions, or they might create a new user-friendly form that will allow users to enter records into a database.

All of the ideas from testing, reviewing and receiving feedback on the modified technology system should be considered as learners go through the refinement process.

Learning aim D

For 2D.P6: learners should explain how their modified technology system is suitable for the intended purpose and the original requirements.

For level 1, as a minimum, learners should identify how their modified technology system is suitable for the purpose and the original requirements.

For 2D.M5: learners should build on the explanations for the Pass criterion, and review how well the ‘client’ requirements and purpose have been met. They should also seek feedback from the ‘client’ about the modified technology system. An interview would be an ideal way of discussing the modified technology system and recording the feedback. Learners should provide details of how any constraints have affected the modified system.

For 2D.D4: learners should evaluate their initial plans against the modified technology system. They should justify any changes that were made and explain the rationale for those changes. They should also give recommendations for at least three improvements but do not need to implement any enhancements.
**Suggested assignment outlines**

The table below shows a programme of suggested assignment outlines that cover the assessment criteria. This is guidance and it is recommended that centres either write their own assignments or adapt any assignments we provide to meet local needs and resources.

<table>
<thead>
<tr>
<th>Criteria covered</th>
<th>Assignment title</th>
<th>Scenario</th>
<th>Assessment evidence</th>
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<tbody>
<tr>
<td>2A.P1, 2A.M1, 2A.D1 (1A.1)</td>
<td>Investigation</td>
<td>You work as a software installation engineer for an IT company that specialises in maintaining technology systems. For this scenario, a ‘client’ manages a small company with employees that use technology systems. They want to know: the benefits and implications of installing and maintaining software in at least two different technology systems; how software in at least one technology system could help improve productivity in their organisation. You need to consider the strengths and weaknesses of the software for a given technology system. Prepare a presentation or a report for the ‘client’.</td>
<td>● Web page.</td>
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<td>● Presentation.</td>
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<td>● Report.</td>
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<td>● Interview.</td>
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</tbody>
</table>
### Criteria covered

2B.P2, 2B.M2, 2B.P3, 2B.D2 (1B.2, 1B.3)

### Assignment title

Planning

### Scenario

The ‘client’ would like you to install and maintain the software in one technology system.

Your task is to plan the installation and maintenance of software to fulfil your ‘client’ requirements.

Produce a plan to include:

- a list of the installation and maintenance activities
- a description of software resources required for an installation or upgrade
- a description of customisation tools and techniques you will use when customising software applications to improve productivity
- a test plan.

You must also consider alternative ideas, e.g. different software or customisation tools and techniques of software installation that will fulfil the same purpose.

It is important that you explain how the plan meets the purpose and ‘client’ requirements and what effect it will have on users.

### Assessment evidence

- Web page
- Report.
<table>
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| 2C.P4, 2C.M3, 2C.P5, 2C.M4, 2C.D3 (1C.4, 1C.5) | Installing and Maintaining | You should now have everything you need to start maintaining the technology system. You must demonstrate that you can follow your plan to:  
- safely back up all data and system settings in preparation for a system restore  
- install or upgrade and appropriately configure an operating system  
- install or upgrade at least two different software applications  
- customise at least three different components in one or more installed software applications  
- make further refinements to the technology system by customising software applications to improve productivity – this must include implementing either a macro or form  
- restore all data and system settings.  
Test the modified technology system for functionality and usability and record the results.  
Meet with your ‘client’ to discuss your progress and to gather some feedback about your modified technology system.  
Make any necessary improvements to the modified technology system to improve the overall performance, taking on board feedback from your ‘client’ and test results. | - Witness statements  
- Observation records. |
### Criteria covered

- 2D.P6, 2D.M5, 2D.D4 (1D.6)

### Assignment title

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<td>2D.P6, 2D.M5, 2D.D4 (1D.6)</td>
<td>Review</td>
<td>Evaluate the modified technology system, explaining why it meets the brief, suggesting improvements and considering any constraints.</td>
<td>• Report.</td>
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