

Unit 15: Website Development

Level: **3**

Unit type: **Internal**

Guided learning hours: **60**

Unit in brief

Learners investigate website development principles. They will design and develop a website using scripting languages.

Unit introduction

Increasingly, organisations rely on websites to serve customers and, in some cases, to generate revenue. With millions of web pages being created daily, the need for websites to be engaging, innovative and desirable is important. As a website developer, you must use sophisticated techniques to capture user interest and to ensure that customers are served. The scripting involved in the development of websites has become crucial: website developers need to understand and acquire the necessary skills to find solutions to a variety of scenarios and problems.

In this unit, you will review existing websites – commenting on their overall design and effectiveness. You will use scripting languages such as Hypertext Markup Language (HTML), Cascading Style Sheets (CSS) and JavaScript® and a simple text editor, or rapid application development tools. Finally, you will reflect on the website design and functionality using a testing and review process.

Many software developers, database experts and systems managers need web client development skills as an integral part of their overall portfolio of expertise. This unit will prepare you for employment as a website developer or a website development apprenticeship. The unit will benefit you if you want to go on to higher education to develop your studies.

Learning aims

In this unit you will:

- A** Understand the principles of website development
- B** Design a website to meet client requirements
- C** Develop a website to meet client requirements.

Summary of unit

Learning aim	Key content areas	Recommended assessment approach
A Understand the principles of website development	A1 Purpose and principles of website products A2 Factors affecting website performance	A report describing the different types and purposes of websites. This will include an explanation of the factors that affect website performance and mathematical principles used in website development.
B Design a website to meet client requirements	B1 Website design B2 Common tools and techniques used to produce websites	Learners' devised design documentation arising from the identification of client requirements.
C Develop a website to meet client requirements	C1 Client-side scripting languages C2 Website development C3 Website review C4 Website optimisation C5 Skills, knowledge and behaviours	A digital version of the website product, including an observation record sheet and supporting documentation, such as scripts and annotated screenshots, to justify design decisions. A report evaluating the design and the website against the client requirements.

Content

Learning aim A: Understand the principles of website development

A1 Purpose and principles of website products

- Purpose of websites, including the features of:
 - content-based (Web 2.0 technologies)
 - product and/or service-based
 - target audience, e.g. social networker, seekers, gamers, buyers, age profile, gender
 - requirements, e.g. user-friendly, consistent, navigational, customisable, flexible.
- Principles of website design, e.g. usability, white space, site layout, accessibility, spacing, navigation, typography, alignment, clarity, consistency/intuitiveness, accuracy, content, media, simplicity.
- Media and objects, e.g. position, colour, contrast, size, appropriateness.
- Creativity and innovation, e.g. unconventional layouts, white space, 'outside of the box' thinking, golden ratio.
- Search engine optimisation, e.g. indexing (meta tags), use of keywords, importance of updates, limiting crawling.

A2 Factors affecting website performance

- Where scripts run (on the web server – server-side scripts, or the local client machine – client-side scripts).
- Browser compliance, e.g. which elements are supported by different browsers.
- Server-side factors, e.g. bandwidth availability, number of hits, file types.
- Client-side factors, e.g. upload and download speeds, browser, cache memory, processor speed, interactivity.

Learning aim B: Design a website to meet client requirements

B1 Website design

Understanding the steps involved in developing a design for a client website.

- Problem definition statement requirements: intended audience, full summary of the problem to be solved, constraints, benefits, nature of interactivity, complexity of the website.
- Purpose requirements as defined in a client brief for their interactive website.
- Application of website design principles by professionally created websites.
- Initial design ideas/prototypes (illustrating design principles) and the requirements for an interactive website, including:
 - diagrammatic illustrations, e.g. storyboard, mood board, wireframe, site maps
 - realistic representations
 - search engine optimisation
 - alternative design ideas/prototypes, including compatibility with mobile/tablet devices.
- Client-side scripting design tools and techniques, e.g. pseudocode, flow charts (including use of British Computer Society (BCS) standard flow chart symbols) used to develop original code.
- Effective use of ready-made and/or original assets, e.g. a digital animation, digital graphic, digital audio and video, or any other combined assets.
- Obtaining and using feedback from others to help refine alternative design ideas/prototypes and make decisions.
- Testing plan requirements and its completion with test data to test functionality.
- Identifying technical and design constraints and working around them.
- Legal and ethical considerations applicable to the equivalent legislation in England, Wales and Northern Ireland:
 - Copyright, Designs and Patents Act 1988 and its requirements in terms of protecting software products and digital media, such as images, music and films.
 - Data Protection Act 1998 and the requirements it places on organisations to keep data about living individuals secure.

B2 Common tools and techniques used to produce websites

Use of tools and techniques and their suitability for different client requirements.

- HTML, HTML5 and subsequent updates.
- Tables.
- Forms, text field, text area, buttons, radio buttons, check boxes.
- Navigation, menus, hyperlinks (internal and external), anchors.
- Interactive components, e.g. hot spots, pop-ups, buttons, menus, rollover images.
- Colour schemes, styles and templates.
- CSS, e.g. background colour, background images, text formatting, borders, padding, heading styles, element position.
- Embedded multimedia/digital asset content, e.g. digital animation, digital graphics, digital audio, digital video.
- Accessibility features, e.g. alternative tags, zoom features, text-to-speech.
- The World Wide Web Consortium (W3C®) standards for accessibility and HTML compliance.
- Platform compatibility, e.g. browser, operating system, mobile devices.
- Exporting and compressing of digital assets into suitable file types.

Learning aim C: Develop a website to meet client requirements**C1 Client-side scripting languages**

- Embedding of original client-side scripts into web pages to provide more interactivity and improve the usability of the website.
- Types of web scripting languages, e.g. JavaScript®, VBScript®.
- Uses of scripting languages, e.g. alerts, confirming choices, browser detection, creating rollovers, checking/validating input, handling forms.
- Constructs, e.g. syntax, loops, decision-making, functions, parameter passing, handling events, methods.

C2 Website development

Creation of interactive websites, including:

- use of CSS, e.g. HTML tags, CSS frameworks, box model, access CSS from HTML, doc types
- use of original client-side scripting
- compatibility with mobile and tablet devices
- effective use of tools and techniques
- the uploading of files to a web server or host computer/device.

C3 Website review

Reviewing interactive websites:

- quality in comparison with other similar websites
- suitability for intended purpose and audience
- suitability against the client's requirements, including optimisation
- legal and ethical constraints
- strengths and improvements.

C4 Website optimisation

Optimising an interactive website, including:

- performance and user testing
- obtaining and evaluating feedback from others
- checking interactivity
- checking compatibility
- refinements and making improvements to meet client needs to optimise the website.

C5 Skills, knowledge and behaviours

- Planning and recording, including the setting of relevant targets with timescales, how and when feedback from others will be gathered.
- Reviewing and responding to outcomes, including the use of feedback from others, e.g. IT professionals and users who can provide feedback on the quality of the website and their suitability against the original requirements.
- Demonstrate own behaviours and their impact on outcomes, including professionalism, etiquette, supporting others, timely and appropriate leadership, accountability and individual responsibility.
- Evaluating outcomes to help inform high-quality, justified recommendations and decisions.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Understand the principles of website development		A.D1 Evaluate how the principles of website design are used to produce creative, high-performance websites which that client requirements
A.P1 Compare the principles of website design used in two websites, including their suitability for the intended audience and intended purpose.	A.M1 Analyse how the principles of website design are used to produce creative, high-performance websites that meet client requirements.	
Learning aim B: Design a website to meet client requirements		BC.D2 Evaluate the design and optimised website against client requirements. BC.D3 Demonstrate individual responsibility, creativity and effective self-management in the design, development and review of a website.
B.P2 Produce designs for a website that meets client requirements.	B.M2 Justify the design decisions, explaining how they will meet the user's needs and be fit for purpose.	
B.P3 Review the website design proposals with others to identify and inform improvements.		
Learning aim C: Develop a website to meet client requirements		
C.P4 Produce a website for an intended audience and purpose.	C.M3 Optimise a website to meet client requirements.	
C.P5 Test the website for functionality, compatibility and usability.		
C.P6 Review the extent to which the website meets client requirements.		

Essential information for assignments

The recommended structure of assessment is shown in the unit summary along with suitable forms of evidence. *Section 6* gives information on setting assignments and there is further information on our website.

There is a maximum number of two summative assignments for this unit. The relationship of the learning aims and criteria is:

Learning aim: A (A.P1, A.M1, A.D1)

Learning aims: B and C (B.P2, B.P3, C.P4, C.P5, C.P6, B.M2, C.M3, BC.D2, BC.D3)

Further information for teachers and assessors

Resource requirements

For this unit, learners must have access to software resources that will allow them to use tools and techniques (given in the unit content) to design and develop websites. For example, text editors (such as Notepad®++), rapid authoring software (such as Dreamweaver®, Kompozer), File Transfer Protocol (FTP) service (such as FileZilla®) to upload websites to a web server.

Essential information for assessment decisions

Learning aim A

For distinction standard, learners will give a detailed and balanced evaluative report that explains how the two sites meet user requirements. This must be explored further by identifying the requirements of the websites, for example it has a secure login, and why these are important for the user. Learners will discuss what overall impact the site will have on the organisation, including positive and negative outcomes. The report will demonstrate high-quality written/oral communication through use of accurate and fluent technical vocabulary to support a well-structured and considered response that clearly connects chains of reasoning.

For merit standard, learners will show a clear understanding of how the two sites employ different principles of website design to develop websites that are creative and high-performing. Learners will give a detailed analysis of how user needs and principles of website design impact on the design and development of a website. The report must provide a balanced discussion, supported by reasoned examples. It will be technically accurate and demonstrate good-quality written/oral communication.

For pass standard, learners will give a detailed comparison of two websites, for example Asda and Tesco – two similar commerce sites, with an explanation of who the site is aimed at and its purpose. Learners will explain the use of design principles in each website to compare their application. The evidence may have some inaccuracies and the comparison may be unbalanced.

Learning aims B and C

For distinction standard, learners will draw on, and show synthesis of, knowledge across the learning aims to evaluate how the decisions and methodologies applied throughout the design, development, maintenance, optimisation and testing stages of their website impacted on the overall outcomes. They will consider whether the website meets client requirements, including achieving its stated purpose and appealing to the target audience. Learners will justify their designs and provide a discussion on why alternative designs were not used.

Learners will give a detailed and balanced evaluation of how effectively their completed website meets the client requirements, including appealing to the target audience and meeting its stated purpose, in comparison to alternative solutions. Their evaluation will be supported by evidence from all stages of the project to reach conclusions and suggest developments. The evaluation must contain a systematic and accurate review of their own skills, performance and behaviours and the impact that this had on the development of the final website. Learners will take individual responsibility for their own work, for example identifying potential issues and resolving them, reviewing their work and making improvements, keeping their work safe and secure and showing responsible use of quoted materials. Creativity will be shown, for example, by taking innovative approaches to problem-solving and through the originality of their solution.

For merit standard, learners will apply their knowledge through selection and application of appropriate methodologies to design, develop, maintain and test an effective, optimised website to meet client requirements. Learners will produce comprehensive designs, including alternative solutions. When developing their website, learners will produce an optimal solution to meet client requirements as closely as possible. Learners will also gather and analyse feedback on their website in order to make improvements. Learners will record the changes that are made and produce subsequent versions of the website as appropriate.

Learners will give a clear analysis of the success of their solution, giving accurate and reasoned suggestions as to how the solution could be improved, they will discuss alternative solutions that could be implemented if the task were to be repeated. They will consider how decisions they made during the project affected the outcomes, and justify why these decisions were made. They will give an evaluation of how their skills and behaviours affected the outcomes of the website.

For pass standard, learners will apply understanding through the planning and development of the website to meet client requirements. Learners will produce detailed designs for their website including user requirements, visual designs and technical documentation. Learners will carry out and document a number of tests and reviews of the website (including use of test users and appropriate test plans, schedules and test data) to ensure that the solution works and meets the identified criteria. They will give evidence that different types of testing have been carried out and that important problems and errors identified have been responded to. Learners' websites will be functional and meet the identified requirements, but there may be some performance issues and/or the implemented solution may not be as efficient or effective as it could be.

Learners will review how the decisions they made during planning and development affected the website. Learners will explain the extent to which the website meets the initial project brief. They will consider both positive and negative aspects of the website, although their review may be unbalanced and/or superficial. They will make reference to the possible alternative solutions that could be implemented.

Links to other units

This unit links to:

- Unit 10: Human-computer Interaction
- Unit 11: Digital Graphics and Animation
- Unit 12: Digital Audio
- Unit 13: Digital Video
- Unit 17: Mobile Apps Development
- Unit 22: Systems Analysis and Design
- Unit 25: Web Application Development.

Employer involvement

This unit would benefit from employer involvement in the form of:

- guest speakers
- technical workshops involving staff from local organisations/businesses
- contribution of design/ideas to unit assignment/scenario/case study/project materials, including own organisation/business materials as exemplars where appropriate
- feedback from staff from local organisations/businesses on plans/designs/items developed
- opportunities for observation of organisational/business application during work experience
- support from local organisation/business staff as mentors.

