Unit 7: Digital Applications Development

Level: **2**

Unit type: **Optional**

Assessment type: **Internal**

Guided learning hours: **60**

Unit in brief

Learners develop skills by exploring the concepts of digital application development, user interface (UI) design and testing to create a functional digital media product for a defined target audience.

Unit introduction

Digital media products are an essential part of working and individual life: we encounter digital products daily on a mobile, a desktop PC, a tablet or even on a smart TV. As technology advances, so do the developments in digital products and their uses in a business context. You will develop an exciting digital product based on a client's needs and explore coding and a variety of media production applications.

In this unit, you will develop the skills to create a digital application in a business context and make use of a variety of digital platforms to enhance this activity, challenging your development skills and creating a product using current technology. You will develop your product considering the user experience, demonstrating an understanding of why this is important in business and to the consumers who use the applications.

You will learn a range of transferable skills that apply to IT in a business context, preparing you for progression into employment or further study. Some example job roles relevant to this unit include junior developer, content coordinator, trainee mobile developer.

Learning aims

In this unit you will:

A Develop skills to produce a digital application for an organisational purpose

B Create a user interface design for an organisational purpose

C Create and test a digital application for an organisational purpose.

Unit summary

Learning aim	Key teaching areas	Summary of suggested assessment evidence
A Develop skills to produce a digital application for an organisational purpose	**A1** Uses of digital applications **A2** Digital media systems **A3** Content management	A report or presentation identifying the features and functions of a range of digital media applications including hardware and software considerations. Digital portfolio displaying a range of sample code blocks and content components to be used in the development of a digital application. A report or presentation discussing usability and the relevant UI features. Create interface designs, considering how the interface will be usable and maximising visual appeal. Create planning documents for designs: flow chart/designs. Produce a digital application developed using appropriate digital media an d interactive content. Produce a test plan with evidence of tests carried out.
B Create a user interface design for an organisational purpose	**B1** Usability **B2** User experience **B3** User interface design	
C Create and test a digital application for an organisational purpose	**C1** Planning the application **C2** Creating a digital application **C3** Testing applications	

Key teaching areas in this unit include:

Sector skills	Knowledge	Transferable skills/behaviours
• Using given information relating to IT architecture models together with business, data and HCI design deliverables to inform software development and testing activities • Functionally test that given designs have been met	• The relationship between physical software design, data, and HCI design and software development	• Problem solving by providing a software solution for a given scenario, demonstrating making a variety of decisions to find solutions to a problem

Unit content

Knowledge and sector skills

Learning aim A: Develop skills to produce a digital application for an organisation's purpose

A1 Uses of digital applications

- Exploring a range of digital application types for organisational purposes and considering their impact and use.
- Exploring the features of digital applications and how they are developed and implemented for an organisational purpose.
- Considering a range of digital applications and how their characteristics can be used for a variety of purposes, such as:
  - marketing
  - sales
  - information
  - e-commerce
  - support services
  - financial
  - collaboration.
- Considering a range of real-world digital products and exploring their effectiveness for an organisational purpose. Key considerations to be included:
  - target audience
  - purpose
  - aesthetics, e.g. content and quality
  - copyright considerations
  - multimedia
  - interactivity
  - accessibility
  - importance of proofing content.

A2 Digital Content Systems

Creating different types of content for an organisational purpose.

- Media for printed visual products (e.g. posters, packaging, point of sale promotions, magazine/brochures, leaflets, flyers)
- Media for digital products (e.g. film, animation, interactive media, augmented reality, web banners, digital adverts, CGI)

Consider the purposes of visual products e.g. entertainment and leisure, communication and socialising, education and training, marketing, virtual reality simulations, publishing, customer service/support.

Consider the design fundamentals of creating digital media:

- raster/bitmap or vector
- dimension
- resolution
- house style
- layout
- white space

- typography
- colour modes
- file types

Identify organisational needs:

- Audience e.g. gender, age, income, occupation, education, household size, stage in the family life cycle, accessibility, address, location, climate, personal attributes, (e.g. attitudes, values and lifestyle) existing or not existing customer
- message (i.e. who, what, where, when, how and why)
- design fundamentals
- budget
- deadlines
- existing branding
- delivery platform

Selecting appropriate software and hardware for creating digital media.

Identify appropriate software:

- vector graphics software (e.g. Corel Draw, Visio, Serif Draw Plus, Adobe Illustrator)
- raster graphics/bitmap software (e.g. Paintshop Pro, GIMP, Paint, Adobe Fireworks)
- dedicated manipulation software (e.g. Photoshop, Photoshop Elements, Serif PhotoPlus)
- web authoring (e.g. DreamWeaver, Serif Web 8, Microsoft Visual Studio)
- video editing (e.g. Adobe Premiere, Windows Movie Maker, Corel VideoStudio)
- animation package (e.g. Adobe Flash, Blender, GoAnimate)
- sound editing software (e.g. Adode Audition, Audacity, WavePad)

Identify software considerations:

- file sizes (e.g. storage, file transfer, download speeds)
- compatibility (e.g. web technology, hardware (Mac/PC/mobile device, availability of software to run that file type)
- compression (e.g. lossy and lossless)

Identify appropriate hardware:

- specification (e.g. processor, memory, graphics card, sound card)
- devices (e.g. monitor, printer, digital camera, scanner, graphics tablet)
- file storage (e.g. CD ROM, hard drive, Cloud, USB).

Identify hardware considerations:

- processing speed
- graphics capabilities
- storage capacity
- peripheral needs with respect to scanners, cameras, printers and graphics tablets
- monitor capacity (e.g. size, refresh rate, etc.)

A3 Content management

- Exploring content management systems (CMS) and their use for developing digital applications.
- Creating and modifying components of digital applications in a CMS, including:
  - formatting and editing techniques:
    - common functions, e.g. text, graphics, fonts, text formatting, colour schemes, images
    - simple editor programs and file extensions
    - syntax conventions
  - interactive elements, e.g. rollover images, submit buttons, email forms
  - optimisation techniques, e.g. image, video, animation, sound, file size, format, dimensions, compression
  - good practice, such as:
    - consistent file and folder management
    - appropriate naming conventions
    - documentation of developments
    - ensuring accessibility, e.g. accessibility aids, readability, colour scheme, subtitles.

Learning aim B: Create a user interface design

B1 Usability

- Usability and how this applies to mobile, web and desktop applications, with consideration of the following:
  - the importance of the term 'user experience'
  - usability and usability characteristics, e.g. visibility, control, feedback, consistency, error prevention, flexibility
  - assessing the usability of a range of applications such as websites, mobile and desktop applications
  - accessibility and how it applies to systems design and development.
- UI content features and their impact on usability, including:
  - pointer, icons, desktop: grouping of icons, menus, images, text formatting, colours and general user appeal
  - text size, colour with no background, colour clash
  - ensuring icons are easy to see and identify
  - sounds
  - timing
  - general styles
  - provisions for ease of access
  - sourced assets, e.g. videos, images.
- Consider and use:
  - input controls, i.e. buttons, text fields, checkboxes, radio buttons, drop-down lists, list boxes, toggles, date field
  - navigational components, i.e. breadcrumb, slider, search field, pagination, slider, tags, icons
  - informational components, i.e. tooltips, icons, progress bar, notifications, message boxes, modal windows.

B2 User experience

- Learners will consider graphical elements of UI design and their impact on the user experience, applying these techniques to their own designs. Consideration should include:
  - keeping the interface simple
  - creating consistency and using common UI elements
  - being purposeful in page layout
  - strategically using colour, texture and text styles
  - ensuring there is no cognitive overload.
- The concept of visual appeal and how systems can be designed to have a strong visual appeal for the user, including:
  - the visual appeal of a system design and its importance to a user
  - UI design and how it can be applied
  - interaction design
  - how user experience is impacted by the user's technical level, e.g. novice to advanced
  - the impact of a poor user experience on the user
  - the impact on the business of a poorly-designed user experience
  - accessibility of the systems for a range of users.

B3 User interface design

Learners will design a UI for a given scenario, applying knowledge of UI design and demonstrating application of the following in their designs.

- Principles of UI design, including:
  - input controls
  - navigation components
  - information components.
- UI for a given scenario, taking into account:
  - simplicity
  - consistency
  - layout
  - colour/texture
  - typography
  - communication, i.e. the system provides the user with feedback
  - shortcuts
  - user skill levels, i.e. a novice to advanced user can use the system in a way suitable for them.
- A range of media formats for a rich user experience, including:
  - audio files, e.g. .wav, .aiff, .flac, .mp3
  - image files, e.g. .jpeg, .gif
  - video files, e.g. .mpg, .avi, .mov, .wmv
  - animations, e.g. flash, animated GIFs.

Learning aim C: Create and test a digital application for an organisational purpose

C1 Planning the application

- Planning methods for planning a digital application, such as:
  - flow charts
  - Gantt charts
- Screen layout design and how it relates to user experience:
  - input of data, e.g. input boxes, drop-down lists, screen prompts
  - output of information, e.g. colour, position, content
  - usability.

C2 Creating a digital application

- Developing media for a digital application using a CMS.
- Demonstrating the creation of a digital application, including:
  - creating a range of interactive content using a CMS
  - editing a range of types of content, e.g. image, video, audio, animations and text elements
  - creating a range of forms and templates in the CMS
  - creating an overall style for the application, considering a range of design features

C3 Testing applications

- The concepts of testing applications and the tools and techniques used, to include:
  - the purpose of testing
  - the stages of testing, including alpha, beta and user acceptance
  - the tools and techniques available when testing a software application, e.g. debugging tools, step through, break points
  - the difference between functional and non-functional testing, including white box and black box testing
  - developing test plans, including appropriate test cases
  - creating test plans, including the test, purpose, expected result, actual result, errors and actions and the improvements to be made.
- Test plan, which includes consideration of functional and non-functional elements and the following design principles:
  - functionality, e.g. working internal/external navigation, content loads/works
  - usability, e.g. clear navigation, easy to use, speed
  - accuracy of content, e.g. spellchecked and proofread
  - readability, e.g. text readable with background colour, size and font are legible
  - accessibility, e.g. viewable in different screen resolutions and on phone/tablet with varying screen size
  - overall performance, e.g. the product does what it is required and designed to do and works on the identified platform(s).
- Exploring the role of a software tester by testing peers' developed products by utilising their pre-produced test plan.
- Obtaining test feedback from peers.

Transferable skills

Problem solving

- Functionally test that given designs have been met.
- Problem solving by providing a software solution for a given scenario, demonstrating making a variety of decisions to find solutions to a problem

Developing practical and technical skills

- Understand the relationship between physical software design, data and human-computer interaction (HCI) design and software development.

Thinking skills and adaptability

- Using given information relating to IT architecture models together with business, data and HCI design deliverables to inform software development and testing activities.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Develop skills to produce a digital application for an organisational purpose		
A.P1 Produce digital content for an application and identify digital applications suitable for the creation of digital content considering both hardware and software requirements to meet and organisational need.	**A.M1** Explain digital applications suitable for the creation of digital content considering both hardware and software requirements to meet and organisational need and produce a range of digital content within a content management system to meet organisational needs.	**A.D1** Justify choice digital applications suitable for the creation of digital content considering both hardware and software requirements to meet and organisational need and produce a range of interactive digital content within a content management system to meet organisational needs.
Learning aim B: Create a user interface design		
B.P2 Create a UI design, identifying the key usability and accessibility features included.	**B.M2** Create a UI design, explaining the key usability and accessibility features included.	**B.D2** Create a UI design independently, justifying the design against user requirements, highlighting the key usability and accessibility features and providing alternative solutions.
Learning aim C: Create and test a digital application for an organisational purpose		
C.P3 Create a digital media within a content management system.	**C.M3** Create a range of interactive digital media to produce a functional digital application within a content management system, making an improvement based on user feedback.	**C.D3** Create a range of interactive digital media to produce a multi-functional digital application within a content management system, making significant improvements based on user feedback.
C.P4 Test a digital application, providing feedback and a completed test plan, including two positive comments and one area for development.		

Essential information for assessment decisions

Learning aim A

For distinction standard, learners will:

- produce a series of high-quality components to be used in a CMS that demonstrates high levels of creativity. The content created will be seamlessly linked to the unique code created to enhance the quality of the digital product.
- Clearly discuss rational for choice of CMS referring to a range of hardware and software features that support the enhancement of the digital media being created.

For merit standard, learners will:

- produce a series of components to be used in a CMS that demonstrates some creativity in their production.
- Explain choice of CMS referring to some hardware and software features relevant to the creation of digital media being created.

For pass standard, learners will:

- produce a series of components to be used in a CMS that takes the format of text, graphical elements and interactive components.
- Identify a CMS that could be used for the creation of digital media identifying one hardware and one software feature relevant to the creation of digital media.

Learning aim B

For distinction standard, learners will:

- produce a complex and high-quality UI design, working independently and detailing considered use of usability and accessibility features. The designs produced will contain alternative solutions for review by the client.

For merit standard, learners will:

- produce a UI design of acceptable quality, demonstrating some consideration for usability and accessibility features, and requiring some assistance.

For pass standard, learners will:

- produce a UI design of simple quality, using some key components and demonstrating the ability to identify usability and accessibility features in their simplest form.

Learning aim C

For distinction standard, learners will:

- produce a comprehensive, multifunctional interactive digital application, working independently with a high level of consideration of user experience design and interface elements to accompany its functionality.
- demonstrate significant improvements to the product based on the test feedback gathered, all of which will be fully utilised to further improve the product and consider both interface and functional elements.

For merit standard, learners will:

- produce a multifunctional digital application with some interactive features. The application will demonstrate some consideration for user experience and interface elements
- demonstrate an improvement to the product based on the test feedback gathered, some of which will be used to improve one feature of the product.

For pass standard, learners will:

- produce a functional digital application creating some digital media content. The application produced may contain some functional elements but may not be fully functional.
- demonstrate following a test plan to test a digital application against a set of predefined criteria, providing simple feedback.

Assessment activity

The summative assessment activity takes place after learners have completed their formative development. The activity should be practical, be set in a realistic scenario and draw on learning from the unit, including the transferable skills. You will need to give learners a set period of time and number of hours in which to complete the activity. *Section 6* gives information on setting assignments and there is further information on our website.

A suggested structure for summative assessment is shown in the *Unit summary* section, along with suitable forms of evidence. This is for illustrative purposes only and can therefore be adapted to meet local needs or to assess across units where suitable opportunities exist. The information in the *Links to other units* section will be helpful in identifying opportunities for assessment across units.

The following scenario could be used to produce the required evidence for this unit. Centres are free to use comparable scenarios or other forms of evidence, provided that they meet the assessment requirements of the unit.

Suggested scenario

Your manager has asked you to plan, develop and test a digital application suitable for a client's requirements. You will produce content and designs for the desired digital application, including interface designs and the relevant documentation before the production of the application.

You will develop the digital application following standard conventions, which will contain a suitable interface and interactive elements, including input and output to the user.

Following the development of the application, you will conduct testing to gain feedback that can be used to review the product and to support a consideration of areas for further development.

If a retake is necessary, an alternative example must be used. The following is an example of a retake assessment activity.

The retake scenario will follow the same activity as above but providing a different scenario for learners to work from.

Your manager has asked you to plan, develop and test a digital application suitable for a client's requirements. You will produce content and designs for the desired digital application, including interface designs and the relevant documentation before the production of the application.

You will develop the digital application following standard conventions, which will contain a suitable interface and interactive elements, including input and output to the user.

Following the development of the application, you will conduct testing to gain feedback that can be used to review the product and to support a consideration of areas for further development.

Further information for tutors and assessors

Delivery guidance

The following are examples of practical activities and workshops that tutors could use when developing sector and transferable skills in the delivery of this unit. Wherever possible, practical activities should be used to help learners develop both personal and sector skills in preparation for the final assessment. These suggestions are not intended as a definitive guide to cover the full GLH of the unit.

Introduction to unit

A tutor-led discussion on the types of digital application that are used, their features and functions, and their use in a business context, including the impact on consumers. This should include the full range of application types included in the unit content and allow learners to explore the concepts discussed by sourcing real-world examples.

Learners develop their understanding of digital applications, identifying the different features and functions used to influence consumers and the impact this has on business. This will take the form of practical activity facilitated by tutor-led discussions.

Learners consider real-world case studies of digital applications and their effectiveness for a range of business purposes through group discussion activities.

Learners take part in group discussion activities to compare different types of digital applications, including their advantages and disadvantages for a range of business purposes.

Suggested time: about 4 hours.

Activity: Digital Media Systems

Tutor-led discussion on types of CMS and other applications used to create digital media content.

Learners will explore different organisational purposes for which digital media content may be created.

They will consider the hardware and software considerations required for selecting applications to design different types of content.

Learners will create a range of digital media content for different purposes using a range of different applications.

Suggested time: about 8 hours.

Activity: Content management

Learners create and modify a range of digital components to be used in a CMS This should include a range of graphical and interactive components.

Suggested time: about 4 hours.

Activity: Usability and user experience

Learners explore the key concepts of usability and how graphical elements in an interface can have a positive and negative impact on the user experience. Learners explore real-world examples of a variety of interfaces, identifying key usability considerations and drawing comparisons between different products.

Learners explore how interfaces are designed to create a positive user experience, including the key components that they will use in their own designs.

Suggested time: about 4 hours.

Activity: UI design

Learners design their own interface for a given scenario, applying the principles of usability and user experience design. Their designs should include test, graphical and interactive elements.

Suggested time: about 6 hours.

Activity: Develop a digital application

Learners plan a digital application for a given scenario, considering the digital media content, UI and input/output components required.

Learners will create a range of interactive digital content to be used within a CMS to produce a digital application for a given purpose.

Suggested time: about 10 hours.

Activity: Testing applications

Learners develop structured test plans for their own digital applications. Learners test a peer's digital application, utilising their test plan to gain a fuller appreciation of the role of a software tester.

Learners review their own application in the context of test feedback to suggest improvements to their developed application.

Suggested time: about 6 hours.

Essential resources

For this unit, learners will need access to a suitable:

- cross-platform mobile development environment
- content management system.

Links to other units

This unit has strong links to:

- Unit 1: Set Up and Configure Technology Systems
- Unit 2: Exploring Current and Emerging Technologies
- Unit 10: Organisational Uses for Digital Media Systems.

Employer involvement

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

- guest speakers – particularly those working in a software development role
- case study materials for businesses that use digital applications for varying commercial purposes
- work experience in a small development or testing team
- support from local business staff as mentors in the areas of software development and testing.