

SQA Advanced Unit specification

General information

Unit title: Developing Mobile Web Based Applications:
An Introduction (SCQF level 7)

Unit code: HR9X 47

Superclass: CB

Publication date: August 2017

Source: Scottish Qualifications Authority

Version: 01

Unit purpose

This Unit is designed to introduce learners to the design and production for web based apps for mobile devices. It is intended for learners undertaking a SQA Advanced Qualification in Computing or a related area that requires knowledge of developing a mobile web based app.

Outcomes

On successful completion of the Unit the learner will be able to:

- 1 Compare the features of mobile devices and industry structure that can affect the production of mobile web based applications.
- 2 Design a solution for a mobile web based application.
- 3 Develop a solution for a mobile web based application.

Credit points and level

2 SQA Credits at SCQF level 7: (16 SCQF credit points at SCQF level 7)

SQA Advanced Unit Specification

Recommended entry to the Unit

Access to this Unit will be at the discretion of the centre. It is recommended that learners have prior experience of using computer systems or studied a programming language at NQ level. In addition, learners could have prior knowledge and experience of programming and graphic/visual design of web site development. . Alternatively, learners should have considerable practical work experience and some appreciation of the role of program design and implementation.

Core Skills

Achievement of this Unit gives automatic certification of the following Core Skills component:

Complete Core Skill	None
Core Skill component	Critical Thinking at SCQF level 6 Planning and Organising at SCQF level 6

There are also opportunities to develop aspects of Core Skills which are highlighted in the Support Notes of this Unit specification.

Context for delivery

If this Unit is delivered as part of a Group Award, it is recommended that it should be taught and assessed within the subject area of the Group Award to which it contributes.

The Assessment Support Pack (ASP) for this Unit provides assessment and marking guidelines that exemplify the national standard for achievement. It is a valid, reliable and practicable assessment. Centres wishing to develop their own assessments should refer to the ASP to ensure a comparable standard. A list of existing ASPs is available to download from SQA's website (<http://www.sqa.org.uk/sqa/46233.2769.html>).

Equality and inclusion

This Unit specification has been designed to ensure that there are no unnecessary barriers to learning or assessment. The individual needs of learners should be taken into account when planning learning experiences, selecting assessment methods or considering alternative evidence.

Further advice can be found on our website www.sqa.org.uk/assessmentarrangements.

Unit specification: Statement of standards

Unit title: Developing Mobile Web Based Applications: An Introduction (SCQF level 7)

Acceptable performance in this Unit will be the satisfactory achievement of the standards set out in this part of the Unit specification. All sections of the statement of standards are mandatory and cannot be altered without reference to SQA.

Where evidence for Outcomes is assessed on a sample basis, the whole of the content listed in the Knowledge and/or Skills section must be taught and available for assessment. Learners should not know in advance the items on which they will be assessed and different items should be sampled on each assessment occasion.

Outcome 1

Compare the features of mobile devices and industry structure that can affect the production of mobile web based applications.

Knowledge and/or Skills

- ◆ Current mobile industry structure
- ◆ Mobile device product range
- ◆ Mobile device operating systems
- ◆ Design principles applicable to the mobile environment
- ◆ Mobile experiences — mobile websites, native apps and hybrid apps

Outcome 2

Design a solution for a mobile web based application.

Knowledge and/or Skills

- ◆ User requirements
- ◆ Platform restraints
- ◆ Target platform
- ◆ User interface
- ◆ Icons
- ◆ Colour
- ◆ Typography
- ◆ Legibility

Outcome 3

Develop a solution for a mobile web based application.

Knowledge and/or Skills

- ◆ Usability and Accessibility
- ◆ Navigation
- ◆ Use of current and appropriate tools, languages and technologies
- ◆ Use of appropriate file formats
- ◆ Use of mobile specific events and handlers
- ◆ Use of mobile specific prompts and alerts for user interaction
- ◆ End user input

Evidence Requirements for this Unit

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills across all Outcomes.

The evidence for this Unit may be written or oral or a combination of these. Evidence may be captured, stored and presented in a range of media (including audio and video) and formats (analogue and digital). Particular consideration should be given to digital formats and the use of multimedia.

The Evidence Requirements for this Unit will take two forms:

- 1 Evidence of cognitive competence (Knowledge and Understanding) for Outcome 1.
- 2 Evidence of practical competence (practical abilities) for Outcomes 2 and 3.

To achieve Outcome 1 the candidate will need to demonstrate that they will be able to:

- ◆ describe the current mobile industry structure including device manufacturers and network or service providers.
- ◆ compare a range of current mobile devices including differences, popularity and uses.
- ◆ compare the popular mobile device operating systems and their restraints.
- ◆ explain the design principles applicable to the mobile environment and the constraints set by the operating system.
- ◆ compare mobile websites, native apps and hybrid apps including architecture, strengths and weaknesses.

Sampling is permissible when the evidence for cognitive competence is produced by a test of knowledge and understanding. The test may take any form (including oral) but must be supervised, unseen and timed. The contents of the test must sample broadly and proportionately from the contents of the knowledge domain (see above). Access to reference material is not appropriate for this type of assessment. If other methods of assessment are used, such as a report or presentation, open-book conditions must be applied. Refer to the assessment guidelines for further information.

SQA Advanced Unit Specification

For the practical competence in Outcomes 2 and 3 the candidate will be required design and develop a working design solution for a web based mobile app. The candidate will need to demonstrate that they will be able to:

- ◆ Produce design documentation and designed elements including:
 - User requirements
 - Platform restraints
 - Design aspects for a specific target platform
 - Design of a workable user interface
 - Design of icons for use within the application
 - Effective use of colour
 - Cogent use of typography
 - Design of legible graphical elements.
- ◆ produce an easy to use mobile web based application accessible from a mobile device.
- ◆ produce an effective navigation route for a mobile web based application.
- ◆ use current tools and technologies suitable for developing mobile web-based applications.
- ◆ use events and handlers specific to mobile web-based applications.
- ◆ use mobile specific prompts and alerts for user interaction.
- ◆ provide simple user input.
- ◆ save files in appropriate formats and location.

Evidence of practical competence may be produced over an extended period of time. Evidence may be wholly or partly produced under controlled conditions. When evidence is produced in uncontrolled or loosely controlled conditions it must be authenticated. The *Guidelines on Approaches to Assessment* (see the Support Notes section of this specification) *provides* further advice on methods of authentication.

The *Guidelines on Approaches to Assessment* (see the Support Notes section of this specification) provides specific examples of instruments of assessment.

Unit Support Notes

Unit title: Developing Mobile Web Based Applications: An Introduction (SCQF level 7)

Unit Support Notes are offered as guidance and are not mandatory.

While the exact time allocated to this Unit is at the discretion of the centre, the notional design length is 80 hours.

Guidance on the content and context for this Unit

Outcome 1 is designed to help the learners gain enough knowledge so they have a good understanding of all the components that affect the design and development of web based mobile applications. These should include an overview of the current industry structure and how quickly it has been evolving. Areas to cover are device manufacturers and network or service providers. An interesting aspect would be to compare the UK and the rest of the world, a comparison of currently available and popular mobile devices and their main uses as well as the differences between the major operating systems. At the time of writing (in the UK) these are Android, iOS and Windows. The learners should be made aware of the design guidelines that the operating systems produce. These are very accessible online. At the time of writing guidelines can be found here for iOS: <https://designcode.io/iosdesign-guidelines> Android: <http://developer.android.com/design/index.html> and Windows: <https://developer.microsoft.com/en-us/windows/design/>

It is important for the learners to know the differences as well the pros and cons between Mobile websites, Native apps and hybrid apps.

Outcomes 2 and 3 cover the design and development of a web based mobile app and at the time of writing the focus could be on either a native or hybrid app.

This Unit will cover how effectively the functionality of the application works and looks. The intention of the Unit is to keep the Outcomes as generic as possible to allow the Unit to be delivered using any of the current tools, technologies and coding languages and that are suitable and available to design and create a native or hybrid app.

Examples of current tools and technologies include HTML, CSS and JavaScript and <https://cordova.apache.org/> or MIT's App Inventor for creating Android Apps.

This Unit is aimed at the following possible job roles or an interest in:

- ◆ Interface designers
- ◆ Computer programmers
- ◆ Interactive designers
- ◆ Graphic designers
- ◆ Web designers and developers
- ◆ Brand design and development
- ◆ Visual designers

Guidance on approaches to delivery of this Unit

Delivery of the Unit would be best served by completing Outcome 1 first. Outcome 1 should be assessed by means of a report. This Outcome will give the learners a general backing in the understanding of the Unit goals. The remaining two Outcomes should be assessed via a project. Integration of Outcomes 2 and 3 will provide a more holistic approach more akin to the production and design of a software product.

The type of project undertaken by the learner may include a game, quiz, information system or an e-commerce style 'shopping cart'. If a 'shopping cart' style of application is undertaken, the learner would not be required to activate any means of credit or debit card payment. The Unit may be integrated with other related Units covering production and design of web based products.

Guidance on approaches to assessment of this Unit

Evidence can be generated using different types of assessment. The following are suggestions only. There may be other methods that would be more suitable to candidates.

Centres are reminded that prior verification of centre-devised assessments would help to ensure that the national standard is being met. Where candidates experience a range of assessment methods, this helps them to develop different skills that should be transferable to work or further and higher education.

Outcome 1 could be evidenced by a report or a presentation by the candidate covering the Evidence Requirements bullet list. Both the report and the presentation should be backed up with research presented as written, pictorial and graphical information. Candidates should evaluate the information gathered in writing their report or presentation. The report should consist of a word count in the region of 1,000. The presentation should last no less than 10 minutes.

For Outcome 2 evidence could be displayed in the design quality, workability and effectiveness of all the graphic elements. Legibility with an understanding of typography, user interface design and use of colour should all be evaluated to ensure a high quality look and feel is applied and adhered to. The design should meet the design objectives and be designed to meet the target audience expectations and needs. The design samples and files produced by the candidate will be assessed for their use of appropriate formats and for the development of graphic elements.

The candidates should supply the original un-flattened files to allow assessment of authenticity of the design and production of the graphic elements and to assess their creative and design production skills.

In Outcome 3, the evidence required here is the workability of the application. Evidence will be generated within the code and production of functional elements through the use of events for the application and the different interactive activities. Candidates will use suitable code for the target platform/s and use appropriate file formats for the graphical elements produced. Candidates will store the files at a location from which the application can be tested and downloaded.

It is recommended that the assessments for Outcomes 2 and 3 be integrated into one holistic assessment.

Opportunities for e-assessment

E-assessment may be appropriate for some assessments in this Unit. By e-assessment we mean assessment which is supported by Information and Communication Technology (ICT), such as e-testing or the use of e-portfolios or social software. Centres which wish to use e-assessment must ensure that the national standard is applied to all learner evidence and that conditions of assessment as specified in the Evidence Requirements are met, regardless of the mode of gathering evidence. The most up-to-date guidance on the use of e-assessment to support SQA's qualifications is available at www.sqa.org.uk/e-assessment.

Opportunities for developing Core and other essential skills

Problem Solving, ICT and Communication Core Skills could be developed within this Unit.

Communication skills will be developed as the learner completes Outcome 1 in the writing of a report. If the learner presents their report, the communication skills could be developed as a sales pitch for an application to a client. Also, taking part in discussions, explaining concepts and solutions, writing the report or notes for the presentation and keeping written records of the development stages will add to the learner's communication skills development.

Problem Solving will be developed while the learner resolves design, technical, product and scheduling issues as they work through the Outcome 2 and 3. Making decisions about what to do, making arrangements and plans and carrying them out will assist in the planning of the production of the application. The thinking about all aspects of the situation and design/production problem will develop the learner's critical thinking skills. This will all be evaluated by the functionality and workability of the designed and produced application.

ICT skills will be developed with the use of software packages to create graphical elements, write reports, developing a presentation and in the production of internet scripting.

This Unit has the Critical Thinking and Planning and Organising components of Problem Solving embedded in it. This means that when learners achieve the Unit, their Core Skills profile will also be updated to show they have achieved Critical Thinking at SCQF level 6 and Planning and Organising at SCQF level 6.

SQA Advanced Unit Specification

History of changes to Unit

Version	Description of change	Date

© Copyright SQA 2016, 2017

This publication may be reproduced in whole or in part for educational purposes provided that no profit is derived from reproduction and that, if reproduced in part, the source is acknowledged.

SQA acknowledges the valuable contribution that Scotland's colleges have made to the development of SQA Advanced Qualifications.

FURTHER INFORMATION: Call SQA's Customer Contact Centre on 44 (0) 141 500 5030 or 0345 279 1000. Alternatively, complete our **Centre Feedback Form**.

General information for learners

Unit title: Developing Mobile Web Based Applications: An Introduction (SCQF level 7)

This section will help you decide whether this is the Unit for you by explaining what the Unit is about, what you should know or be able to do before you start, what you will need to do during the Unit and opportunities for further learning and employment.

Mobile application (app) design is complex and challenging. Selecting suitable tools and coding languages and designing a mobile web application require an understanding of the benefits, costs, context, and restrictions of the end user, target device and industry structure. This Unit is designed to introduce you to the skills required for developing mobile web based applications.

In Outcome 1, the Unit begins by introducing the features that can affect the production of mobile web applications. You will be introduced to the key concepts and attributes affecting the user experience to clarify the components used to make the user experience positive and enjoyable. You will address target platforms and industry conditions and gain an understanding of product development and design solutions. This Outcome will involve you researching areas specific to your chosen design and production brief. Your research will assist in the design and production of your application ensuring you meet the technical specifications of your chosen target platform.

Outcomes 2 and 3 are practical in nature. For Outcome 2 you will be required to produce a design solution for a mobile web-based application using the principles of applications development and suitable graphic production programmes. You will develop research skills to help the development of your design solution.

Outcome 3 will require you to apply the design produced in Outcome 2 to create a prototype mobile app suitable for the target platforms identified in Outcome 1. You will use appropriate simple applications development and human-computer interaction principles in the production of elements and coding of events for your mobile application's different interactive activities. You will create, store and use appropriate file formats for the graphical elements. You will store the files at a location from which the application can be accessed and tested.

On completion of this Unit you should feel suitably confident to extend the experience to cater for mobile web based applications.

This Unit has the Critical Thinking, and Planning and Organising components of Problem Solving embedded in it. This means that when you achieve the Unit, your Core Skills profile will also be updated to show you have achieved Critical Thinking at SCQF level 6 and Planning and Organising at SCQF level 6.