# SQA Advanced Unit specification: general information

**Unit title:** Systems Development: User Centred Design

**Unit code:** HR8T 47

**Superclass:** CB

**Publication date:** August 2017

**Source:** Scottish Qualifications Authority

**Version:** 01

## Unit purpose

This Unit is designed to introduce candidates to the iterative nature of the user centred design process and how this can help ensure that a development meets the needs of the intended users. Candidates will be taught about the typical workflows undertaken in adopting a user centred design approach to a project development and about the methodologies that can be used to accomplish these workflows. They should also develop skills in designing, conducting and evaluating user centred design activities.

This Unit is primarily intended to prepare candidates who expect to gain employment in an IT/Computing-related post at a trainee level in a software development role. Candidates undertaking this Unit may be working towards SQA Advanced Certificate in Computing, SQA Advanced Diploma in Computing, SQA Advanced Diploma in Computing: Software Development SQA Advanced Diploma in Computing: Technical Support or SQA Advanced Diploma in Computing: Networking.

On completion of this Unit the Candidate should be able to:

1    Describe the User Centred Design Process.
2    Apply user Centred Design Methodologies.

## Recommended prior knowledge and skills

Access to this Unit will be at the discretion of the centre, however it would be beneficial if the Candidate already possessed good communication skills, information technology skills, and analytical skills, either through workplace experience or training at an appropriate level.

This could be exemplified by possession of the following Core Skills *Communication* (SCQF level 5), *Information and Communication Technology (ICT)* (SCQF level 6) and *Problem Solving* (SCQF level 4).

## Credit points and level

1 SQA Credit at SCQF level 7: (8 SCQF credit points at SCQF level 7*)

*SCQF credit points are used to allocate credit to qualifications in the Scottish Credit and Qualifications Framework (SCQF). Each qualification in the Framework is allocated a number of SCQF credit points at an SCQF level. There are 12 SCQF levels, ranging from National 1 to Doctorates.*

## Core Skills

Opportunities to develop aspects of Core Skills are highlighted in the Support Notes of this Unit specification.

There is no automatic certification of Core Skills or Core Skill components in this Unit.

## 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.

## Unit specification: statement of standards

**Unit title:** System Development: User Centred Design

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The sections of the Unit stating the Outcomes, Knowledge and/or Skills, and Evidence Requirements are mandatory.

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. Candidates 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

Describe the User Centred Design Process.

### Knowledge and/or Skills

♦ User centred design lifecycle
♦ User centred design workflows
♦ User centred design methodologies

### Evidence Requirements

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can:

♦ describe the user centred design lifecycle.
♦ describe the common workflows used within the development process.
♦ describe a range of user centred design methodologies.

The assessment for this Outcome should be conducted under supervised closed-book conditions and the questions presented must change on each assessment occasion.

As an alternative to traditional assessment methods (eg paper-based), candidates can provide a digital record of evidence to demonstrate Knowledge and/or Skills. Suggested approaches are outlined in the Support Notes — Guidance on the assessment of this Unit.

# Outcome 2

Apply User Centred Design Methodologies.

## Knowledge and/or Skills

♦ Methodologies used for Requirements Analysis
♦ Methodologies used for Designing solutions
♦ Methodologies used for Evaluation of solutions

## Evidence Requirements

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can design, conduct and evaluate an appropriate user centred design activity for:

♦ analysing requirements.
♦ designing a solution.
♦ evaluating a solution.

At least one of the methodologies should involve users in evaluating the design. It is acceptable for a Candidate to use the same methodology for up to two of the activities (eg they could produce a survey for analysing requirements and a different survey for evaluating usability).

Care must be taken to ensure the authenticity of a Candidate's submission.

As an alternative to traditional assessment methods (eg paper-based), candidates can provide a digital record of evidence to demonstrate Knowledge and/or Skills. Suggested approaches are outlined in the Support Notes, Guidance on the assessment of this Unit.

## Unit specification: support notes

**Unit title:**    Systems Development: User Centred Design

This part of the Unit specification is offered as guidance. The support notes are not mandatory.

While the exact time allocated to this Unit is at the discretion of the centre, the notional design length is 40 hours.

## Guidance on the content and context for this Unit

This Unit is designed to introduce candidates to the iterative nature of the user centred design process and how this can help ensure that a development meets the needs of the intended users. Candidates will learn about the typical workflows undertaken in adopting a user centred approach to a project development and about the methodologies that can be used to accomplish these workflows.

The user centred design process is a well established development approach that has been documented in a number of standards (ISO 13407, ISO TR 18529 and ISO 9241). The approach can be adopted for a wide range of developments including mobile apps, websites, front end applications and games developments. Most of the user centred methodologies adopted in this approach are also commonly used in other development approaches and can help ensure that the finished products meet the users' requirements.

Outcome 1 is theoretical in nature and outlines the user centred design approach, emphasising the iterative nature of the development and the methodologies that can be used in each of the common workflows (requirements analysis, design and construction and evaluation).

Candidates should be introduced to a current user centred design process that illustrates how such a process is both iterative and incremental. Given that this Unit is levelled at SCQF level 7, it is probably more sensible to introduce the candidates to one of the simpler models based on ISO 13407 such as:
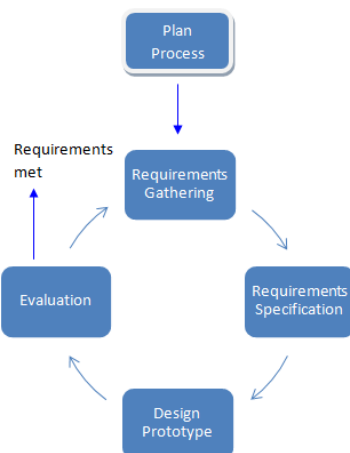


User Centred Design Process (adapted from ISO 13407)

In this model the initial planning is followed by an iterative development phase. The workflows within the development phase are repeated until the product is ready for deployment. The chosen model could then be compared to at least one other model to allow candidates to see how different approaches can be adopted.

Candidates should be made aware that the initial planning is likely to result in an overall plan that identifies the resources, timescale and overall milestones required for the development. Suitable user centred methodologies should be selected for the development. The methodologies selected will be dependent on both the type of development and the proposed timescale.

They should also be taught about the common workflows that would be undertaken throughout a typical development phase. For example candidates should be made aware that a typical development will involve iterating through requirements analysis, prototype construction and evaluation. Early iterations may well encompass a feasibility study, which commonly involve a range of user centred design activities such as surveys used for market research. This may be followed by iterations that involve focus groups to help clarify the requirements along with participatory design activities to help design some initial prototypes. Later iterations may well include usability testing to help ensure that the design is suitable for the intended users.

In the final part of the Outcome, candidates will be introduced to a range of user centred design methodologies. The range of methodologies covered should include at least two methodologies that could be used for each one of the following workflows:

♦ Analysing requirements
♦ Designing the solution
♦ Evaluating the solution

Methodologies selected could include:

♦ Questionnaires
♦ Surveys
♦ Focus groups
♦ Interview
♦ Prototypes
♦ Participatory design
♦ Usability testing
♦ Heuristic evaluation
♦ Subjective evaluation

Candidates should be made aware of both the purpose of the technique and where the technique can be used. For example questionnaires can be used for both analysing requirements and for evaluating a working prototype.

Outcome 2 is more practical in nature and allows candidates to develop skills in designing, conducting and evaluating user centred design activities. The methods covered should include at least two methodologies that could be used for each one of the following:

♦ Analysing requirements
♦ Designing a solution
♦ Evaluating a solution

This Unit covers some of the skills described for a pre entry/Junior technician role in the National Occupational Standards — IT and Telecoms (2009). The main areas covered correspond to discipline 4.3 Human Needs Analysis and discipline 4.6 Human Computer Interaction/HCI Design. There are also ample opportunities within the Unit to address a range of skills at both foundation and intermediate level that are described in the National Occupational Standards for IT Users v3. The most likely areas to be covered would be Using the Internet and IT Software Fundamentals.

## Guidance on the delivery of this Unit

The Unit can be delivered as a standalone Unit or in conjunction with a range of other Units including *Software Development: Developing Small Scale Standalone Applications* or *Software Development: Programming Fundamentals* to develop a product relevant to current trends in computing. For example, at the time of writing, it may be advantageous to use the Unit to design a mobile app. If the Unit is delivered as a standalone Unit, candidates may well need to be supplied with appropriate prototypes to apply some of the user centred methodologies such as usability testing.

Given that this Unit is levelled at SCQF level 7, it is probably more sensible to introduce the candidates to one of the simpler models based on ISO 13407. The model chosen should illustrate how the common workflows are repeated until the product is ready for deployment.

Candidates could then be introduced to a range of user centred design methodologies and have the opportunity to apply some of these to a given scenario. There are many methodologies that could be covered here dependent on the scenario adopted. Ideally candidates should have the opportunity to design each activity, run the activity with a group of users and then evaluate the results. They should be made aware that some of the methodologies could be used for more than one workflow in the development process.

It would make sense to start by describing a range of methodologies that could be used for requirements analysis (eg questionnaires, surveys and focus groups) and then undertake some practical activities where the candidate has the opportunity to design, conduct and evaluate two different activities used for requirements analysis.

This could be followed by introducing the candidates to a range of methodologies that could be used for designing solutions (eg prototypes, storyboards and style guidelines) and then undertake some practical activities where the candidate has the opportunity to design, conduct and evaluate two different activities used for designing solutions.

The candidates could then be introduced to methodologies that could be used for evaluating solutions (eg usability testing, heuristic evaluation, user surveys). They could then be provided with some small developments to allow them the opportunity to design, conduct and evaluate two different activities used for evaluating solutions.

As the candidates work through these practical activities, they should be encouraged to build up a portfolio showing how they designed the activity, how they conducted the activity and how they evaluated the results of the activity. It may well be possible to combine the assessment evidence for the open-book assessment with these activities.

The practical activities undertaken in Outcome 2 should help the candidates retain the knowledge requirements for Outcome 1 and it would therefore make sense to undertake the closed-book assessment for Outcome 1 after completing Outcome 2.

## Guidance on the assessment of this Unit

The assessment for this Unit should evidence that candidates can describe the user centred design process and that they have successfully applied a range of user centred design methodologies.

A wider range of methodologies could be covered in Outcome 1 where the candidate is expected to understand the purpose and use of user centred design methods. The methods should include methodologies that can be used for requirements gathering (eg questionnaires, surveys and focus groups), iterative design activities (eg evaluating prototypes, storyboards and style guidelines) and evaluation (eg usability testing, heuristic evaluation, user surveys).

Both of the assessments for this Unit could be undertaken using e-assessment techniques. The closed-book assessment for Outcome 1 lends itself to a standard online objective assessment. The open-book assessment for Outcome 2 could be undertaken using an e-portfolio.

## Assessment Guidelines

### Outcome 1

Evidence for all of the Knowledge and/or Skills in this Outcome could be assessed using a representative sample of 20 multiple-choice questions. The majority of the questions would probably relate to user centred design methodologies but it is recommended that the assessment has a minimum of five questions related to each knowledge point. If this approach is adopted then it is recommended that the candidate should complete this assessment within one hour and that candidates should answer at least 60% of the questions correctly.

### Outcome 2

The assessment for this Outcome is open-book and care should be taken to ensure the authenticity of each candidate's response.

The assessment may take the form of a portfolio where candidates are able to build up the required evidence as they work through the practical learning activities. Candidates should be encouraged to involve users in evaluating their designs.

## Online and Distance Learning

It would be perfectly feasible to develop a range of blended learning material to support distance learners. Online technology such as e-learning objects and links from virtual learning environments could be used support this type of delivery. Support for distance learners could be provided by both synchronous and asynchronous communication technologies such as the use of virtual classrooms and forums.

Outcome 1 could be assessed using an online objective assessment and Outcome 2 could be assessed using an E-portfolio. Care would need to be taken to ensure the authenticity of assessments undertaken by distance learners as outlined in the SQA guide.

## Opportunities for the use of 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 candidate evidence and that conditions of assessment as specified in the Evidence Requirements are met, regardless of the mode of gathering evidence. Further advice is available in *SQA Guidelines on Online Assessment for Further Education (AA1641, March 2003).*

## Opportunities for developing Core Skills

Although there is no automatic certification of Core Skills or Core Skill components in this Unit, there are opportunities for developing the critical thinking skills, planning and organising skills and reviewing and evaluating skills required for the *Problem Solving* Core Skill at SCQF level 5. One of the design methods developed for Outcome 2 could be used to evidence the *Problem Solving* skills at SCQF level 5. Further information on the requirements for assessing problem solving skills at SCQF level 5 can be found at http://www.sqa.org.uk/sqa/files_ccc/F3GD_11_ASP.pdf.

There are also opportunities for developing the Using Graphical Information skills required for the Numeracy Core Skill at SCQF Level 5. Learners will be expected to interpret graphical data and situations involving probability to solve real-life problems involving measurement, for example, creation of surveys for gathering evaluative data which could be presented graphically, then analysed and summarised.

## 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.

## History of changes to Unit

| Version | Description of change | Date |
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# General information for Candidates

## Unit title:    Systems Development: User Centred Design

This Unit is designed to introduce you to the user centred design process and how this can help ensure that a development meets the needs of the intended users. This design approach can be adopted for a wide range of developments including mobile apps, websites, front end applications and games developments.

Outcome 1 is theoretical in nature and introduces you to a current user centred design process and allows you to compare this to another user centred design model. You will have the opportunity to learn about how user centred design models are both incremental and iterative and how this can lead to more usable products. You will also be introduced to a wide range of user centred design methodologies such as questionnaires, surveys, focus groups, interviews, storyboard designs, prototypes and usability testing. The assessment for this Outcome is closed book and is designed to assess your knowledge of the user centred design process and the methodologies that can be used to perform user centred design activities.

In Outcome 2, you will have the opportunity to develop skills in designing, conducting and evaluating a selection of user centred design methods. This will include using methodologies for analysing user requirements, designing user orientated solutions and for evaluating the usability of a design. You will be expected to involve users in evaluating your designs. The assessment for this Outcome is open-book and involves you recording both the development and the results of a number of user centred design activities.