



The Open  
University

# TM356/SSEP

## Specimen Solutions Examination Paper

### INTERACTION DESIGN AND THE USER EXPERIENCE

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Time allowed: 3 hours

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*Note – the sample answers provided are not exhaustive but are intended to give an approximate feel for the depth of answer required.*

There are **TWO** parts to this paper and you should attempt **BOTH** parts.

**Part 1** Attempt **ALL** questions in Part 1. Part 1 carries 60% of the total examination marks.

**Part 2** You should attempt **ONE** question from Part 2. Part 2 carries 40% of the total examination marks.

**Note that, although this specimen paper gives you a choice of questions for Part 2, this will not be the case for the actual examination. We have given you two examples in this specimen in order to help you prepare.**

#### **At the end of the examination**

Check that you have written your personal identifier and examination number on each answer book used. **Failure to do so will mean that your work cannot be identified.**

Put all your used answer books together with your signed desk record on top. Fasten them in the top-left corner with the round paper fastener. Attach this question paper to the back of the answer books with the flat paper clip.

## PART 1

Answer all of the questions in this part.

### Question 1

Describe **two** benefits of good interaction design and **two** problems that derive from poor interaction design.

(4 marks)

**Sample answer:**

*Good interaction design can help minimise mistakes with safety critical equipment such as aircraft and medical equipment, thus saving lives. Good interaction design can also speed up frequently performed operations, therefore saving large amounts of time for individuals, employees and companies.*

*Poor interaction design can make interactive products error-prone and hard to understand, causing frustration with interactive devices, programs and websites. Poor interaction design can also lead to slow, inefficient interactions with an interactive product, lowering productivity for a company that depends on its use (e.g. for order entry).*

### Question 2

Name **two** interaction design principles. **For each principle**, explain how it contributes to achieving good interaction design.

(4 marks)

**Sample answer:**

*Perceivability and consistency are two fundamental design principles.*

*The principles of perceivability ensure that users are able to perceive (see, hear, feel, as appropriate) the elements of a user interface, which is essential in order for them to be able to interact with it.*

*The principle of consistency ensures that similar elements of a user interface look and behave similarly (e.g. the 'home' button on a website is identified by a similar icon, and icons that look like the 'home' button actually take the user to the home page when activated). This helps, for example, ensure that a new interface does not have to be learned from scratch, as users are able to identify or recognise patterns.*

### Question 3

The interaction design process has three key characteristics. Name **two** of these key characteristics, and **for each** characteristic, explain why it is important.

(4 marks)

**Sample answer:**

*Iteration is one of these key characteristics. Aspects that are important in order to develop a good interactive product, and the requirements that emerge from these aspects, usually emerge gradually – often not until a prototype is evaluated. Iteration enables designers to make incremental improvements in a design and ensure that user requirements are fully met.*

*User involvement is another key characteristic. It is critical in helping designers understand the design context, the requirements that an interactive product needs to meet, and possible design solutions that can meet those requirements.*

**Question 4** Scenarios and personas are often used during the design process. Briefly explain:

- (a) the difference between scenarios and personas in terms of the information that each represents
- (b) **two** different ways in which scenarios can be used during the design process.

(4 marks)

**Sample answer:**

(a) *A persona is a description of a fictitious person created to represent a group of users, giving the designer someone to imagine designing for. A scenario is an informal story representing user activities and interactions with an interactive product, including details of the environment.*

(b) *Scenarios can be used to establish requirements related to the activities and interactions they represent. Scenarios can also be used as prototyping tools, to sell design ideas to users, managers and potential customers.*

**Question 5** Imagine you are designing a navigation system for boats, to help sailors find the best and safest sea routes to get to destinations they want to reach. Give **two** examples of questions you would ask about the physical environment in which the navigation system might be used in order to establish requirements for the system. **For each** question, explain how the answer might inform the requirements.

(4 marks)

**Sample answer:**

*Example questions about physical environment*

- *Is the system or interface likely to get wet, by being submerged or spilled on?*
- *Are cold weather conditions likely to stifle users' hands or require them to wear gloves?*

*How answers might influence design*

- *A wet environment might imply a requirement that the system is waterproof.*
- *Cold weather conditions might imply a requirement that the system enables interaction in spite of reduced dexterity or while wearing gloves, for example via large buttons or joystick.*

**Question 6** Thinking of data gathering methods, explain when it is more appropriate to use *focus groups* and when it is more appropriate to use *interviews*. In **each case**, justify your answer providing specific examples.

(4 marks)

**Sample answer:**

*Focus groups are more appropriate for exploring collective consensus. For example, if a new system (e.g. to manage the use of medical supplies) was being introduced that affected the work of different stakeholders (e.g. doctors, nurses and administrators), focus groups could help identify the views of different team members.*

*Interviews are more appropriate for exploring individual experiences in more depth. For example, they could help designers get a detailed understanding of the activities and requirements of particular user groups (e.g. the doctors).*

**Question 7**

**For each of the two** data gathering approaches observing users and asking users, provide one advantage and one disadvantage.

(4 marks)

**Sample answer:**

*Asking users*

*Advantage: asking users is the simplest way to find out about their assumptions, beliefs, attitudes, motivations, and in general about their background.*

*Disadvantage: sometimes what users say does not reflect reality or even what they really think, as they endeavour to show themselves in a good light, or to please the interviewer.*

*Observing users*

*Advantage: observation reveals what people actually do.*

*Disadvantage: actions may not explain why users do what they do.*

**Question 8**

There are many benefits to reflecting on the *conceptual model* for an interactive product as part of the design process. Briefly explain:

- (a) the difference between the conceptual model and the interface of an interactive system
- (b) two reasons why it is useful to make a distinction between conceptual model and interface.

(4 marks)

**Sample answer:**

(a) *A conceptual model describes what a user can do with a system, and what a user needs to understand to be able to operate the system; it does not include implementation details related to the user interface. On the other hand, the user interface is the part of the system that the user can perceive and interact with; different interfaces could be different ways of implementing the same conceptual model.*

(b) *It is useful to distinguish between conceptual model and interface so that designers can communicate, design, critique and improve the conceptual model itself without getting bogged down in interface detail that is not relevant in the early stages of design. Another reason why the distinction is useful is that, once the conceptual model has been defined and perfected, it can facilitate the systematic exploration of the use of a range of user interfaces, spanning several interface types.*

**Question 9**

Cognitive processes – such as memory, focus and attention – are accounted for in different ways in different interface types. Choose **two** of these processes and briefly explain how **each one** can be accounted for in a design based on the following interface types respectively:

- (a) screen-based graphical interface
- (b) haptic interface.

(4 marks)

**Sample answer:**

(a) *Screen-based graphical interfaces can support memory by acting as a visual cache – in other words the user need not memorise all of the details of an interaction – the screen can act as an external memory, lessening demands on the user's memory. Screen-based interfaces can focus attention through spatial grouping, font style or size and colour – for example, errors may be highlighted in red, important information may be styled in bold, and related information may be grouped together.*

(b) *Haptic interfaces can focus attention by buzzing on different body locations where users are more likely to perceive them among other distractions. They can support memory by consistently buzzing in a particular pattern to convey specific messages, that is, remind the user that it is time to do some activity.*

**Question 10**

In the age of ubiquitous computing, it is more appropriate to talk about 'perceivability' rather than 'visibility'. Explain why this is the case, providing an example of an interface that illustrates this.

(4 marks)

**Sample answer:**

*Interactive products are increasingly capable of engaging multiple senses, including vision, hearing, touch, and even taste and smell. Therefore, to account for the growing variety of possible interactions, it is appropriate to extend the definition of the principle of visibility and reframe it as perceivability.*

*For example, perceivability of a word-processing system for users with visual impairments is likely to depend principally on audio output, rather than on visual output.*

**Question 11**

A distinction can be made between *low-fidelity* and *high-fidelity* prototypes. Thinking of a **low-** and **high-**fidelity prototype **respectively**:

- (a) Briefly describe an example of such a prototype.
- (b) Briefly explain when it would be useful to use such a prototype.

(4 marks)

**Sample answer:**

(a) *A low-fidelity prototype might be a paper sketch showing a screen-based interface with labelled layout and text entry areas; this might be in the form of a storyboard showing the main interface states and how the interface changes from one state to another through interaction. On the other hand, a high-fidelity prototype might be a working program with full screen layout and most of the interactivity working, but with some of it still mocked (e.g. pressing buttons simply opens a dialogue box saying that the action has been performed).*

(b) *Low-fidelity prototypes, such as paper-based storyboards, are useful for the early stages of design to quickly explore different design ideas. On the other hand, high-fidelity prototypes such as working programs with defined layout and interactivity, are useful in later stages of the design process to refine or improve on a chosen design.*

**Question 12**

The module discusses three main evaluation approaches: usability testing, field studies and analytical. Fill in the **four** gaps in the following table.

Evaluation approach	Usability testing	Field studies	Analytical
Location	Laboratory	Natural settings	Anywhere
Role of users	1.	2.	Users not generally involved
Main type of data (qualitative or quantitative)	3.	4.	Could be qualitative (list of problems) or quantitative (number of problems)

(4 marks)

**Sample answer:**

- 1. *Typically carry out set tasks*
- 2. *Typically engage in habitual activities*
- 3. *Mainly quantitative*
- 4. *Mainly qualitative*

**Question 13**

You want to evaluate a new app to help tourists find their way around in a foreign city. Explain **two** aspects of the app which you may want to evaluate. **For each** aspect describe **one** method you could use for your evaluation.

(4 marks)

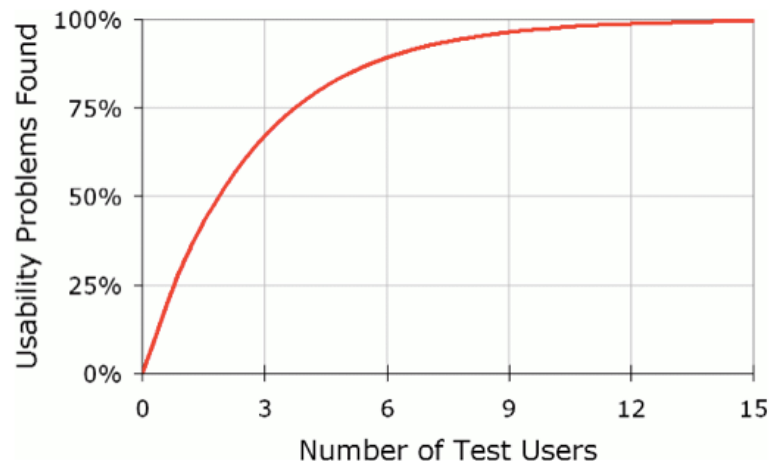
**Sample answer:**

*I might evaluate how easy it is to work out how to use the basic functions of the app. I might also evaluate how easy it is to use the app when one is actually out on the streets of an unfamiliar city.*

*To evaluate the first aspect I could conduct usability tests in the lab, where I can observe what participants do under controlled conditions. To evaluate the second aspect, I could conduct a field study, asking participants to use the app while visiting a foreign city where they can get a realistic experience.*

**Question 14**

The graph below from the Nielsen Norman group summarises findings about usability and user experience evaluation of interactive systems.



Describe **two** findings from the work of the Nielsen Norman group to which the graph refers. **For each** finding, describe one insight that can be derived in relation to conducting evaluations.

(4 marks)

**Sample answer:**

*Doing usability testing with even just one user already provides significant information about usability and user experience issues related to an interactive system. The insight from this finding is that even when only one user is available, user testing is always highly informative.*

*Doing usability testing with five users provides information on most of the usability and user experience issues related to an interactive system. One insight from this finding is that if participants for doing user studies are limited, it is advisable to use no more than five participants for each evaluation.*

**Question 15**

Identify **two** different forms of presentation of quantitative data gathered during an evaluation. **For each** form of presentation, explain when it might be more useful.

(4 marks)

**Sample answer:**

*Quantitative information could be presented in the form of a graph or it could be presented in the form of a table.*

*Presenting quantitative data in the form of a graph is particularly useful to show clearly existing relations within the data and to make comparisons, for example how a population is distributed in space, or how the stock market changes over time. On the other hand, presenting quantitative data in the form of a table is particularly useful to provide a detailed view of each data point, for example, to understand whether there are any anomalies in the data.*



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## **PART 2**

*You should attempt **ONE** question from Part 2.  
Part 2 carries 40% of the total examination marks.*

### **Question 16**

There is a general concern that people are spending too much time seated at their desks and that this is leading to a range of health problems. You have just joined a company that takes the health and well-being of its staff seriously. An initiative is launched to encourage staff to think creatively about ways to improve their health.

You and some of your colleagues decide to use your expertise in interaction design to investigate how technologies can help people focus on improving their posture. You discuss your ideas with the occupational health team at the company, who explain that the main thing to get across to people is to adjust their posture regularly, go for a walk or do some simple stretching exercises at regular intervals.

Answer all of the following questions. In your answers, be specific to the workplace setting of this company and the issue of posture problems. Answers that do not relate to this context will get no marks.

#### **(a) (TOTAL 8 marks)**

You decide to put together a small questionnaire to be sent out to staff in order to better understand the requirements for a technology enabled solution for improving posture. The questionnaire has the following questions:

- Do you have problems with your back or posture? yes/no
- Do you get up regularly from your desk to stretch or walk? yes/no
- Do you think you could benefit from something to remind you to take a break? yes/no

- (i) Identify two circumstances when it may be beneficial to use questionnaires to gather data in this context.
- (ii) Is the format of the questions in the questionnaire above useful? Justify your answer.
- (iii) Apart from the questionnaire, identify two groups of people you could interview to gather insights that could help you identify the requirements. For each group, briefly describe what information you expect to obtain by interviewing them.

**Sample answer:**

(i) Questionnaires could be a good option if the company's employees tend to work from home, or if their working schedules make it difficult for them to engage in other requirement gathering activities such as interviews.

(ii) All the questions in the questionnaire are yes/no questions, and therefore very constrained. The respondents do not have much scope to elaborate on their answer or give opinions. Most questions would benefit from being an open question, for example to ask 'what type of posture problems', or 'how often do they get up from their chairs and exercise', and whether they have ever tried out solutions to be reminded to take a break.

(iii) There are a number of other ways to gather insights:

- I could interview staff, either from my own department, or from other departments, to ask about problems of sitting too much, and find out about strategies other employees have developed to move around regularly.
- I could also talk to the occupational health team to see what problems they come across in the workplace, how they go about addressing them, and what they see as the main issues to focus on.

**(b) (TOTAL 6 marks)**

From the results of your initial data gathering, you decide that a persona would be a useful step in working towards the design. One of your colleagues writes the following:

<b>John Smith</b>	<b>Works in the IT department</b>
37–44 years old	Does not get up from his desk regularly
	Suffers from backache and headaches
	Would like something to remind him to get up more often

Give three limitations of the above persona. For each limitation make one suggestion on how the persona could be improved.

**Sample answer:**

*A persona aims to give a rich description of a fictitious person, so that we can imagine how a real person would go about a task and what their needs are. In this respect, the proposed persona has the following limitations:*

- (i) The description above is very bland and does not provide sufficient detail to suggest that this could be a real person. For example, John Smith is often used to refer to a generic male and 37–44 is a vague age range. Instead, the name could be less conventional (e.g. Andrew Grant), the age could be specific (e.g. 38) and a photo could be included to suggest individuality.*
- (ii) The description above does not provide any background about the person it is supposed to represent. This should include things like special skills the person may have, physical capabilities, or likes and dislikes.*
- (iii) The description above does not provide enough detail about the issues that a persona is supposed to bring to life. Rather than say ‘has backache and headache and doesn’t get up regularly’ the persona should give an idea of the person’s struggles, for example, through a short scenario that gives insight into what their day at work is like.*

**(c) (TOTAL 6 marks)**

The occupational health team suggests that a software tool is available that could be installed on the computers of all the people in the company. This tool automatically sends everyone a reminder to get up and do some exercise.

You and your colleagues want something that is more personalised and flexible, and that uses forms of embodied interaction that are more subtle. You formulate the conceptual design for an interactive product that you feel would be more useful.

Provide this conceptual design under the following three headings:

- the main concept that underlies the interactive product you envisage
- the type of behaviour or activities that the product is expected to promote or support
- important aspects of the user experience.

**Sample answer:**

*The main concept is to provide personal reminders to a person when they are being too stationary at their work desk, and encourage them to stand up and move around, or change position, or do some other physical exercise.*

*Behaviour/activities – the product will have to be usable while employees are sitting at their computers or doing other deskwork while seated, so it should enable them to continue concentrating on their tasks as appropriate and not distract them so much that it becomes impossible to carry out their work. It should relieve employees from having to think about when their next break or walk are due, but at the same time should not distract their attention from normal work, such as reading on the screen or talking on the phone, but blend in with it.*

*UX – this should be a discreet reminder to the individual, not visible to other employees. It should be a gentle nudge, that is subtle and that feels OK. It should not be strong and annoying, interfering with other office tasks, as this would lead employees to switch it off and not use it.*

**(d) (TOTAL 8 marks)**

To implement your conceptual design, you are reflecting on the use of three different interface types to monitor and alert the user about their postures and movements. These are:

- a chair with inbuilt sensors
  - a belt worn by the user
  - a lamp that sits on the user's desk.
- (i) Explain how a Wizard of Oz technique might be used in the process of prototyping the chair design.
- (ii) Give an example of a sensor that could be used to develop the interactive belt, and explain the type of information that can be gained from it.
- (iii) For each of the design ideas above (chair, belt and lamp), explain in what way they express ideas of embodied cognition.

**Sample answer:**

(i) *Wizard of Oz is a technique where, if a design is not fully functioning, then someone can pretend to make it work from behind the scenes. It is important that it gives the user the impression that it is working as intended. In the case of the chair, it is possible that the technology of monitoring posture and that of giving feedback is not fully in place yet. In this case a human observer could, from a position where they are not seen, observe a person on a chair and remotely engage the feedback part of the chair at appropriate moments. This could give a realistic idea of how this would work for the user, before it is fully implemented.*

(ii) *The belt could use accelerometers. These would measure how much the wearer moves.*

(iii) *Embodied cognition is not only about 'thinking in your head', but also about taking into account how we think and absorb information through our bodies, and how we take in the wider environment we are in. It is about a 'whole person' approach to cognition.*

*All three examples – chair, belt and lamp – are about embodied cognition. The chair, because employees would receive information from the system through those parts of their body that are in contact with it; for example, their backs. Similarly, with the belt, employees would receive information from the system around their waist. Being in the employees' environment and presumably being perceived at the periphery of their vision, the lamp too expresses a form of embodied cognition due to the physical effect that ambient light has on the body.*

**(e) (TOTAL 12 marks)**

Assume that the first functioning prototype chair has been developed that can detect a person's posture. The chair also provides haptic feedback in the form of a subtle vibration effect when the person has not moved for some time.

- (i) Briefly discuss, providing reasons, whether an opportunistic evaluation would be appropriate at this point.
- (ii) At a later stage, once the initial prototype chair has evolved, you decide that both a lab-based evaluation and an in-the-wild study are appropriate to investigate different aspects of the prototype. For each study identify and justify:
  - an evaluation question specific to the study
  - a particular type of prospective user to involve in the evaluation
  - an activity they would need to perform.

*Note: for the different studies provide different answers.*

- (iii) You have gathered a substantial amount of qualitative data from your evaluations. Briefly describe three approaches to analyse this data.

**Sample answer:**

*(i) An opportunistic evaluation would be appropriate in this case. In a company setting where people are busy and may have schedules that are difficult to negotiate, it may be easier to quickly ask colleagues to try out the chair in its early form. An opportunistic evaluation could help uncover a major flaw, or identify a misconception that would compromise the viability of the design.*

*(ii)*

*For the lab-based evaluation:*

- *Question: where precisely in the chair should the vibrotactile feedback be provided?*

*This question is more easily investigated in a lab study, as participants can be asked to experience vibrotactile feedback in different places on the chair and give feedback with ratings on a scale of how comfortable this is. We can then precisely measure and compare across a number of participants.*

- *Users: one user group that would be good to include are employees who actually suffer from backache in order to get their input into the system.*
- *Activity: participants would be asked to sit on the chair, and to give a rating of how comfortable it feels and how clearly it alerts. The researcher would activate vibration units in different locations on the chair in a systematic way, covering the various options.*

*For the in-the-wild study:*

- *Question: do participants react to the feedback from the chair when it is part of their ordinary working day?*

*By allowing them to use the chair as a normal chair at their desk, I would be able to investigate whether they would use it as intended and whether it has the desired effect, i.e. making participants get up and exercise regularly.*

- *Users: involve employees from a department where there is a lot of sedentary activity due to the nature of their job, for example clerical staff.*
- *Activity: participants would not need to do a specific activity, but rather do their normal work.*

*(iii)*

*Three main approaches to analysing qualitative data:*

- 1 *Identifying recurring patterns or themes – for example, recurring comments that participants make when they discuss their reactions to the chair's feedback, such as whether it is pleasant or unpleasant.*
- 2 *Categorising data – for example, categorising gestures that people make, such as instances of stretching or standing up – potentially associated with the goals of the product – into distinct groups, so that each group can be further analysed.*
- 3 *Analysing critical incidents – finding occurrences that stand out as critical to the interaction with the chair, for example specific gestures, and then spending time to further analyse them.*

## **Question 17**

Rochesters is a supermarket with large and smaller stores all over the country, but also with a large online ordering presence. From the analysis of their sales figures, the Rochester management team have noticed that online shopping has stagnated somewhat – that is, few new online customers are joining and the volume of online purchases by existing customers also seems not to be growing. They have decided to review the online business to understand how to increase sales.

You are part of a team that has been tasked with evaluating and potentially redesigning the online shopping experience for customers. In particular Rochesters want to have a better understanding of how current customers are using the online services, and whether additional features should be designed to boost figures, increase interest and potentially attract additional customers.

A preliminary report from a marketing consultant has indicated that the users unhappy with the existing online shopping experience fall broadly into two groups as follows:

- *Older people*, who are typically retired. These users are relatively time-rich, but find it difficult to go physically to the supermarket due to various mobility issues and therefore rely on online services for their basic weekly shopping. However, they are also more likely to have accessibility constraints such as restricted eyesight and limited manual dexterity, which means that they are not finding the current online shopping service helpful.
- *Young professionals*, who typically work long hours. These users are relatively time-poor and therefore generally do not have time to go to the supermarket. These young users are not very confident about their catering skills but enjoy entertaining socially and are keen to be able to provide highly creative and sophisticated meals, including exotic delicatessen items, to impress their friends and colleagues.

Answer all of the following questions. In your answers, be specific to the physical and virtual supermarket, and to the issues related to the shopping experience. Answers that do not relate to this context will get no marks.

**(a) (TOTAL 4 marks)**

Identify one usability goal and one experience goal the new website could meet to benefit the group of *older users*. Explain why each of these goals are important for this particular group. The goals must refer specifically to the characteristics of the user group and the Rochester project.

**Sample answer:**

*A good usability goal here is memorability. Together with restricted eyesight and dexterity, older people are likely to experience reduced capacity to remember details of how to use the web service or particular aspects of it, even from one week to the next. So they are likely to benefit from a web service that is easy to remember how to use.*

*A good experience goal is helpful. Older people may be less familiar with using websites and, together with their accessibility constraints, this may mean that they need the web service to be helpful in order to have a good experience with it and want to use it more.*

**(b) (TOTAL 10 marks)**

You decide to use direct observation to elicit requirements from older people for the new Rochester online shopping service:

- (i) Describe one place where you would carry out the observation and what you would observe. Justify your choices.
- (ii) Describe two limitations of using direct observation in this particular case given your choice of location.

- (iii) You want to use one additional method to complement direct observation. Identify two candidate methods and, for each method, describe how it would complement direct observation in this particular case.

**Sample answer:**

(i) *I could go to the supermarket and wander around the aisles to see how older people navigate the shop and select the products they buy; I could also observe if they use the automatic checkout points, how they interact with these, or if they have any difficulties.*

(ii) *In the case of the supermarket location, simply observing people's spontaneous behaviour wouldn't necessarily tell me why they are doing what they do. Also, how people look for and select products in a physical supermarket does not necessarily correspond to how they might do the same tasks on a web service.*

(iii) *I could use interviews with older customers, or do a heuristic evaluation with older customers in mind.*

*In the supermarket scenario, interviews would be useful to understand some of the behaviours I observe in people (I could ask them why they purchase things in a certain order, how they make their selections, etc.).*

*A heuristic evaluation of the already existing web service would help me understand its main shortcomings, and perhaps compare them with what I find about people's experiences in the physical supermarket.*

**(c) (TOTAL 8 marks)**

You are thinking of developing a range of prototypes to help you design the new web service in a way that meets the requirements of your *older user* group. These include paper-based prototypes such as scenario storyboards and interface storyboards, as well as interface storyboards developed with mock-up tools such as PowerPoint and Balsamiq.

Making reference to the context of developing a web shopping service for older people:

- (i) Describe what type of information scenario storyboards and interface storyboards would respectively allow you to convey.
- (ii) Explain in what way the scenario storyboard and the interface storyboard would respectively be useful in this design context.
- (iii) You want to create interactive mock-ups to investigate which interface design might be more aesthetically pleasing for the web shopping service. Describe in what way PowerPoint and Balsamiq could respectively be useful in this particular context.
- (iv) As a part of creating your interactive mock-ups, you want to design a set of icons that is easy for your users to recognise and understand. Describe one advantage of prototypes developed with pen and paper, and one advantage of prototypes developed with mock-up tools.



**Sample answer:**

(i) *In this case a scenario storyboard could show the context in which older users might want to use the service, such as where they are, what they are doing and what is going on around them; for example, as people who have mobility problems and who are likely to complete their shopping at home, the scenario storyboard could show the typical domestic setting of a user and typical activities they might do at home.*

*An interface storyboard could show details of the interface layout with the different controls and displays, including their arrangement, size or colour of different controls and displays (e.g. menus, icons), giving an idea of the options the users would have when doing their shopping and the steps they would need to take to complete the process.*

(ii) *The scenario storyboard could explore how the domestic settings and situations in which the users are likely to do their shopping would need to shape the design of the service; for example, if the user interrupts the ordering process because they start cooking dinner or want to check what is in their cupboards, the system needs to ensure that the user is allowed to resume the ordering process at any time.*

*The interface storyboard could allow me to explore the users' interaction with the service; for example, how easy they find it to do the steps that are needed to place a grocery order.*

(iii) *Using Balsamiq would allow users to assess whether they find the layout of the interface appealing, such as the position of images or the structure of menus.*

*Using PowerPoint would allow users to assess aspects related to the look and feel of the web service, such as the use of colours or other stylistic details.*

(iv) *Paper prototypes are rougher and may not provide the look and feel that prototypes produced with mock-up tools can provide, but they are quick and easy to produce, and can even be drawn in front of the user. On the other hand, prototypes produced with mock-up tools can provide a realistic representation of the icons and sometimes details are key in determining whether an icon is easily recognisable.*

**(d) (TOTAL 12 marks)**

You want the new web shopping service to help older people, who might have difficulty remembering what they need to include in their grocery shopping, and you think of basing the interface on some kind of metaphor.

- (i) Suggest a metaphor idea that you could use to help users remember what they need to buy for their groceries and describe how the metaphor might work.
- (ii) Describe one advantage and one disadvantage of the metaphor you have thought of.

**Sample answer:**

(i) *I could use a simple representation of a kitchen, with a fridge and a cupboard, as a kind of shopping basket. Users could 'place' the products they select in the fridge or cupboard, as they would do in their own home. Returning users would be able to refer to previous shopping 'trips' by checking their fridge and cupboards.*

(ii) *The advantage of this metaphor is that it allows users to feel as though they are transferring items directly from the supermarket into their kitchen, which could prompt them to remember what they need to buy.*

*A disadvantage is that a simple representation may not feel very realistic to users (after all, each kitchen is different), while a realistic representation would be too complicated to render.*

As a result of your requirements elicitation activities with the group of *young professionals*, you have prototyped a smartphone app designed to meet the requirements of this user group for Rochesters' online shopping service. As a priority your app needs to support the following usability goals: efficiency and utility.

**(e) (TOTAL 4 marks)**

You decide to evaluate the goal of efficiency by carrying out a usability test in a usability lab:

- (i) Describe two advantages of this approach..
- (ii) Describe two disadvantages of this approach.

**Sample answer:**

(i) *A usability lab is a controlled environment where experimental conditions are the same for all users; this makes it easier to compare the time it takes to complete given tasks.*

*Being in a laboratory settings also makes it easier to accurately measure users' performance.*

(ii) *This is the evaluation of a prototype app that is to be used in a mobile context, so the time it takes to carry out tasks in the lab is unlikely to be representative of the time it might take in the real context of use.*

*Young professionals are presumably busy people so it may be difficult for them to find the time to go to a usability lab.*

**(f) (TOTAL 2 marks)**

In order to test two different versions of your app, you ask some of your users to complete a task using version A, and some to complete the same task using version B. You find that the group who used version A completed the task significantly faster than the group who used version B. Do these results indicate that version A provides better utility? Justify your answer.

**Sample answer:**

*No, the results do not indicate better utility for version A. Utility is a measure of the extent to which an interactive product enables the user to do what they want to do. Whatever the task, the time it takes to do it is a measure of efficiency.*

**(g) (TOTAL 8 marks)**

You decide to carry out a different kind of evaluation outside of the usability lab. In particular, describe the following, justifying each of your answers:

- (i) What evaluation method would you use?
- (ii) Whom would you involve?
- (iii) Where would you conduct your evaluation?
- (iv) Give an example of what activity you would ask your participants to carry out.

**Sample answer:**

*(i) I would conduct a field study to observe how people use the app in real situations and how quickly and easily they can complete certain tasks while on the go. I would additionally ask them to comment on their experiences. This is important to understand how the app will really perform once deployed.*

*(ii) As far as possible I would involve the prospective users, or users who can closely represent them, e.g. young professionals, young people, or people with demanding jobs. Again, this is important to understand how the app may meet the requirements of its intended users.*

*(iii) I would choose a range of locations and situations that prospective users might want to use the app in. For example, I would give participants specific tasks and ask them to complete those tasks while they are at a station waiting for their train to arrive, while they walk in a city street, while they are at home, and so on. I would want to understand how different environments and activities affect the use of the app.*

*(iv) I would ask participants to use the app to help them plan a meal for a party of four and to purchase the items they need for the meal. This is something the target group of users wants to be able to do, so it is an activity that is appropriate for the participants to do as a part of the evaluation.*

**[END OF QUESTION PAPER]**

Notes on SEP to start here