**Marking Scheme**

Question 1.

It is often alleged by those promoting alternative forms of the System Development Life Cycle (SDLC) that the original form was a simple waterfall or cascade with a single pass and iterations on error discovery limited to return to the previous phase as represented below.

Planning

Analysis

Design

Implementation

System

1. Using similar Diagrams explain the differences between Parallel Development, Phased Development, System Prototyping, Throwaway Prototyping and Agile Development.

For each of the following 3 marks for a completed diagram, 2 marks for appropriate explanation.

1. “Unclear user requirement” is a contingency for which the SDLC forms System Prototyping, Throwaway Prototyping and Agile Development are said to be “excellent”.

Identify five other contingencies that development managers would use for selecting SDLC forms and map eight intersections of excellent fit with particular SDLC forms.

1 mark for each correct intersection as shown below

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Usefulness for** | **Waterfall** | **Parallel** | **Phased** | **Prototyping** | **Throwaway Prototyping** | **Agile** |
| Unfamiliar technology |  |  |  |  | Excellent |  |
| Complex systems |  |  |  |  | Excellent |  |
| Need for highly reliable systems |  |  |  |  | Excellent |  |
| Short time schedule |  |  | Excellent | Excellent |  | Excellent |
| Schedule visibility |  |  | Excellent | Excellent |  |  |

Question 2.

A college uses a proprietary package to manage its admissions. The use scenario, enacted by Admissions Tutors, who are academics teaching on the programmes, is as follows.

Load the College Web site. Scroll to the package portal in the “Quick Llinks” drop- down pane and click “Portal”. The portal login pop-up appears. Enter Username; enter password; click “login” button.

The reports package page appears. Click the “e-Admissions” button. On first use enter Academic Year; Enter Department, Enter Programme group. Click “Retrieve” button (the entered items are presented for next use by the logged in user). The group programme list is displayed. Click the “Course code No” hypertext. The course applicants list is displayed showing in rows clickable buttons for;

1. Application Form, click to display the application form;
2. Non-standard Applicant Form, click to download the non-standard form
   1. Download the form; if the candidate is to be offered the form must be completed and sent by e-mail to the admissions administrator for the programme.
3. A list of documents received from the candidate, referees or other bodies.
   1. Click on the document names to view them.

Open windows are closed only by the windows standard “x” button.

1. Develop a Windows Navigation Diagram for this User Interface.

<<pop-up>>

**Portal Log in**

<<button>>

**Log In**

<<button>>

**cancel**

<<window>>

**College Web Site**

<<dropdown pane>>

**Quick Links**

<<other panes>>

**Names**

<<buttons,etc>>

Click Login button/

{user id, password}

Click Portal log in

Click

Cancel

**Names**

<<window>>

**Reports Package gePackage**

<<button>>

**e-Admissions**

Click e-admissions button/{Academic year, Department, Prog.Group}

<<button>>

**othersl**

<<list>>

**Group Programme**

Click Document etc name.

Click Document M name

Click Document n name

Click NS

form

<<image>>

**etc**

<<image>>

**Document m**

<<image >>

**Document n**

etc

<<hypertext>>

**Document m**

<<hypertext>>

**Document n**

**Documents**

<<list>>

<<form>>

**NonStandard**

<<form>>

**Application**

Click Selected Application Form No

Click Selected Programme Code

<<hypertext>>

**CodeNo**

<<hypertext>>

**OtherCodeNo**

<<hypertext>>

**OtherCodeNo**

<<list>>

**Applicants**

<<hypertext>>

**AppForm**

<<hypertext>>

**NS Form**

<<hypertext>>

**Documents**

3 marks for correct “states”

3 marks for correct “transitions”

3 marks for correct “stereotypes”

3 marks for correct actions

3 marks for correct parameter passing/ data entry

3 marks for completeness.

1. Critically appraise this user interface stating the priority you would place on changes for the next release and subsequent releases.

Heuristics that should be mentioned include breaking of the three click rule before the user can make a decision or act. The workspace is not complete and the user has to load external processes and invoke external systems .e.g. sending the NS form attached to an e-mail, in many cases.

(6 marks)

Completing the NS form within the system should be the highest priority.

(1 mark)

Reducing the number of transitions should be next.

(1 mark)

Suggestions for further improvement.

(1 mark or up to 3 if a rational alternative to the previous two points)

1. Briefly discuss the issues pertaining to novice versus expert users that arise in user interface design and how they may be handled by the system designer.

A reasoned discussion of issues including frequency of use ie. Occasional users vs. use where the interface is a large part of the users job, cost of training, possibility of providing functionaly duplicate interfaces e.g. icon and command line, should be forthcoming.

(6 marks)

Question 3.

Class Motors’ main business is selling new vehicles, mostly cars, for a number of manufacturers. When a customer arrives they work with a sales person to purchase a vehicle. Often, but not always, the customer will be trading in their current vehicle. Sometimes the company will buy a trade-in vehicle without selling a vehicle on the same invoice but usually the invoice details the sale of a new vehicle, the purchase of a trade-in vehicle and any options that the customer requests during the transaction. Sales Persons earn commission according to their past performance

Amongst the attributes that will be recorded in the system will be Customer Number, Customer Name, Customer Address, Customer Phone Number, Trade-in vehicle number, Purchase value, New Vehicle Number, Sale price, Salesperson Identity Number, Commission rate, Option code, Option Price, Transaction Date/time, Invoice number, Manufacturer, Model, Year of Manufacture.

1. Develop a class model showing six concrete classes to hold the information for this situation. Show the associations amongst the classes that you define and the multiplicities at each end of the association. Appropriately place at least two of the attributes shown above in each class of your model.

(24 marks)

Classes should be TradeIn Vehicle, New Vehicle, Invoice, Salesperson, Customer, Options.

(6 times 1 mark for each)

Associations

TradeIn Vehicle (1) to Invoice (0..1)

New Vehicle (0..1) to Invoice (1)

SalesPerson (0..\*) to Invoice (1)

Customer (1..\*) to Invoice (1)

Options (0..\*) to Invoice (0..\*)

Options (1..\*) to NewVehicle (1)

(6 times 3 marks for each)

Attributes

(6 times 1 for each pair)

1. Discuss how and whether you might introduce an abstract class to your model giving the reasons on which you would base your decision.

Some might think there is a case to abstract “Vehicle” from “Trade-in Vehicle” and “New Vehicle”. The wise candidate will argue that there is no shared functionality and are likely to share few common attributes with respectr to their roles in the system.

(3 marks)

Question 4.

1. Marks will be awarded according to how well a student structures his/her thoughts and how well he/she presents his/her arguments. Possible arguments for are: monitoring qualifications would lead to higher-quality software, different models might be workable: it does not have to be introduced for all software development but should be introduced for critical systems, not everyone on a team has to have the qualifications, but there has to be sufficient supervision. Possible arguments against are: would lead to a significant shortage of qualified software engineers (may force some development underground), might be seen as step to corner the market by qualified persons demanding huge salaries.

(24 marks)

1. Two possible contract models that could be discussed are fixed price contracts and time and material. Fixed price contract puts more risk on the supplier, as the complete system has to be delivered for a fixed price, regardless of any unforeseen difficulties. Time and material puts more risk on the client, as the supplier is paid on an hourly/daily basis and the effort put into developing the system may not result in a working system in the end.

(10 marks)

Question 5.

1. Marks will be awarded according to how well a student structures his/her thoughts and how well he/she presents his/her arguments. Possible arguments for using OSS as the basis of a business model are: while the software is given away freely, the services around the software are not (a business would make money out of consultation, support and training, sale of proprietary add-ons). Possible arguments against: it is hard to see how one can make a profit by giving away products freely, anyone can distribute OSS freely, so there is no way to charge customers for this product and anyone might be able to start competing in a certain area by using the work of others without paying for it.

(24 marks)

1. The owner of the copyright has the following rights: the right to make copies, and the right to give copies to the public (does not matter if they are charged for it or not), the right to adapt the work.

(10 marks)