Exercise 1: (6 points)

6

Consider the following problem description:

A Library System has two subsystems: The user interface subsystem which shall be implemented as simple HTML without frames or Java applets, and the borrow subsystem. The customer wants to participate in the development of the user interface system. The borrow subsystem system allows members to borrow books. The system allows each member to search and find the book before borrow it on eight seconds. Besides borrow and return books, a librarian must also handle the addition and removal of members and adds new books. When a book is returned, the librarian must update the books states. The customer wants that the Library System will be developed using the Object Oriented Approach and he wants to use the borrow subsystem once is completed.

Suggest the most appropriates software process models that might be used as a basis for managing the development of the system. Giving reasons for your answer based on the type of subsystems being developed.

Answer:

The user interface subsystem we use is eveloutionary model. Since the customer wants to participate in the development. And for the borrow subsystem we can use waterfall model since the requirments are very clear. And for the Library System we can use incremental model since the clients wants to use the borrow subsystem once it is completed.

Exercise 2: (5 points)

5

Hassan works in a Software Company. The company assigned the task to develop a Gun Fighting game to Hassan. The management explained the complexity of the task and informed Hassan that the task needs to be finished within a month otherwise there is big chance of Project Failure. While working on the project, Hassan came to know that the game has some user actions and scenes that can create arrogance and intolerance in kids that will play the game. Instead of informing to the higher management, he kept quiet and continued his work.

Read the above situation carefully and answer if there is a violation of the Software Engineering Code of Ethics and Professional Practice? Give the Software Engineering Code of Ethics to justify your answer along with the reason. Choose violation(s) from the following list to solve exercise.

a. Provide service in their areas of competence, being honest and forthright about any limitations of their experience and education.
b. Not knowingly use software that is obtained or retained either illegally or unethically.
c. Use the property of a client or employer only in ways properly authorized, and with the client's or employer's knowledge and consent.
d. Disclose to appropriate persons or authorities any actual or potential danger to the user, the public, or the environment, that they reasonably believe to be associated with software or related documents.
e. Accept no outside work detrimental to the work they perform for their primary employer.

Answer:

The violation is that Hassan knew that same user action and scenes can have negative impact on kids who play the game. And that breaks the code of ethics that requires And didn't tell the higher management. And that breaks the code of ethics that requires you to disclose to appropriate persons or authorities.

Exercise 3: *(9 points)*

A Software Company gets a client who wants a software solution for his Grocery Store. A software engineer is assigned the task to interact with the client to collect, analyze and finalize the requirements. After interacting with the customer, the software engineer comes to know that the client needs a system that should permit the Grocery Store staff to add, update, delete and search products' information in the system. The Grocery Store staff should also be able to print the the available quantity of any product in the store. The Grocery Store manager should be able to add a new staff member, update and delete an existing staff in the system. The staff should be able to generate the invoice for any order given by the customer in the Grocery Store. The Software should be available online to all branches of the Grocery Store from 7:00 AM to 10:00 PM from Saturday to Thursday, every week. The client clearly informs the software engineer that the Grocery Store has a licensed version of Windows 10 on every machine and the software must run on Windows 10. Every invoice generated from the system must include 15% Value added Tax (VAT) as a Government Policy.

Identify at least three functional and three non-functional requirements in the situation given below. In case of non-functional requirement, also mention the type of the requirement (Product, Organizational or External).

Answer:

Functional	non-functional
1- add, update, delete and search product's information. ✓	1- The software should be available 7:00 AM to 10:PM (Product requirement) ✓
2- print the available quantity of any product in the store ✓	2- The software must run on windows 10 (organizational requirement) ✓
3- add new staff, update, and delete an existing staff in the system ✓	3- generated invoice must include 15% value added tax. (External requirment). ✓

Exercise 4: *(5 points)*

Consider a project with the following activities. Times are given in weeks.

Activity	Preceding	Time (week)
C	--	6
B	--	4
P	--	3
A	B, C, P	7
U	P	4
T	A	2
R	A	3
N	U	9
F	T, R, N	1

1. Draw the network activity diagram and find the earliest and the latest start/finish time for each activity?

2. Identify critical path(s).

3. What is the slack on activity T.

4. What is the impact to the project if activity B takes three weeks longer than planned?

Answer:

$\frac{0}{0}\Bigg|\frac{6}{6}$ C

$\frac{0}{2}\Bigg|\frac{4}{6}$ B

$\frac{0}{0}\Bigg|\frac{3}{3}$ P

$\frac{6}{6}\Bigg|\frac{13}{13}$ A

$\frac{13}{14}\Bigg|\frac{15}{16}$ T

$\frac{13}{13}\Bigg|\frac{16}{16}$ R

$\frac{3}{7}\Bigg|\frac{7}{7}$ U

$\frac{7}{7}\Bigg|\frac{16}{16}$ N

$\frac{16}{16}\Bigg|\frac{17}{17}$ F
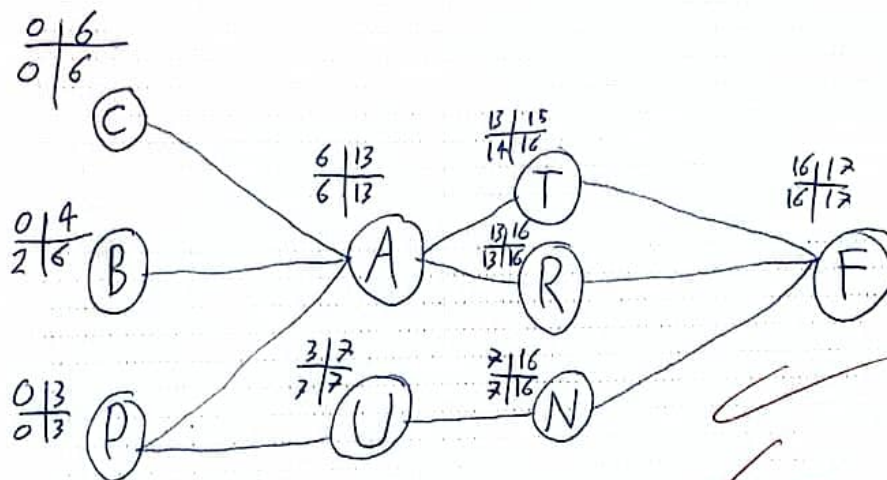
critical paths: PUNF , PARF , CARF

slack of T = 1

The impact of delaying B by three weeks will have the consequence of delaying the whole project by 1 week.