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Online Final – Term Examination Summer Semester 2020

SOFTWARE ENGINEERING

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BS (SE) Section B

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Q.1: Explain why the rapid delivery and deployment of new systems is often more important to businesses than the detailed functionality of these systems. *(6 marks)*

Answer:

A conventional waterfall or specfication-based process is usually lengthy and the final software is delivered to the customer long after it was originally specified. In a fast-moving business environment, this can cause real problems. By the time the software is available for use, the original reason for its procurement may have changed so radically that the software is effectively useless. Therefore, for business systems in particular, development processes that focus on rapid software development and delivery are essential.

Q.2: Explain how the principles underlying agile methods lead to the accelerated development and deployment of software. *(6 marks)*

Answer :

Agile methods: An Agile methods develop the system in increments by using the incremental development processes. These methods made the change of the system in the small increments depending on the requirements of the customer. In this, the customers are included in the development process. The agile methods focus on the software of the system instead of designing and documentation. These methods allow the developers to delivery the software quickly to the customer.

The principles underlying agile development are:

a) ***Individual and interactions over processes and tools.*** By taking advantages of individual skills and ability and by ensuring that the development team knows what each other are doing, the overheads of formal communication and process

assurance are avoided. This means that the team can focus on the development of working software.

b) *Working software over comprehensive documentation.* This contributes to accelerated development because time is not spent developing, checking and managing documentation. Rather, the programmer's time is focused on the development and testing of code.

c) *Customer collaboration over contract negotiation.* Rather than spending time developing, analyzing and negotiating requirements to be included in a system contract, agile developers argue that it is more effective to get feedback from customer's directly during the development about what is required. This allows useful functionality to be developed and delivered earlier than would be possible if contracts were required.

d) *Responding to change over following a plan*. Agile developers argue (rightly) that being responsive to change is more effective than following a plan-based process because change is inevitable whatever process is used. There is significant overhead in changing plans to accommodate change and the inflexibility of a plan means that work may be done that is later discarded.

Q.3: Extreme programming expresses user requirements as stories, with each story written on a card. Discuss the advantages and disadvantages of this approach to requirements description. (*6 marks)*

Answer:

In Extreme programming, requirements are expressed as scenarios which are implemented directly as a series of tasks. This program involves a number of

practices through Incremental planning, Small releases, Simple design, Test-first development, Refactoring, Pair programming, Collective ownership, Sustainable pace, on-site customer.

Advantages and Disadvantages of Extreme Programming user requirements:

Advantages

1. Scenarios cope with most of common operation. It is easy to identify what type of operation that is required in the user's stories.

2. Customer focus in the scenario card increase the chance that the software produced will actually meet the needs of the users

Disadvantages

1. Using scenarios on a card can bring to a function overlooked or omission which can be a time-consuming process to complete the system.

2. Two different scenarios can lead to the same function as it will be conflicted each other. Crossing out redundant scenarios can be a cumber some tasks

Q.4: To reduce costs and the environmental impact of commuting, your company decides to close a number of offices and to provide support for staff to work from home. However, the senior management who introduce the policy are unaware that software is developed using agile methods, which rely on close team working and pair programming. Discuss the difficulties that this new policy might cause and how you might get around these problems. *(8 marks)*

Answer:

The difficulties that may arise with this policy if making employees work from home are:

1. The benefits obtained through agile methods will be less effective due to a communication gap between the members of a team.

2. The benefit of error detection and evaluation through pair programming is lost.

3. Pair programming is not possible. Due to sudden changes in the teams, the project development may be slowed down.

Q.5: Identify and briefly describe four types of requirement that may be defined for a computer-based system. *(6 marks)*

Answer:

Types of requirements for a computer based system:

Generally, system requirements are included to communicate the functionsthat the system should provide. And every computer based systems consistsof many requirements. They are

1. User requirements.
2. System requirements
3. Functional requirements
4. Non-functional requirements.

Description of requirements:

1. User requirements:

The requirements are the statements in a naturallanguage plus diagrams of the services the system provides and itsoperational constraints.

2. System requirements:

A structured document setting out detaileddescription of the system's functions, services and operational constraints. Define what should be implemented. It may be part of acontract between client and contactor.

3. Functional requirements:

These are the statement of the services thesystem should provide, how the system should react to particular inputand how the system should behave in particular situation.

4. Nonfunctional Requirements:

Constraints on the services orfunctions offered by the system such as timing constraints, constraintson the development process, standards, etc. often these are applied tothe system as a whole rather than individual features or services.

Q.6: Using your knowledge of how an ATM is used, develop a set of use cases that could serve as a basis for understanding the requirements for an ATM system. *(10 marks)*

Answer:

Set of Use cases that are used in this ATM use case diagram to understand the requirements of the ATM are given below:

- Insert ATM card
- Enter pin
- Perform required transaction
  - Withdrawal
  - Deposit

o Transfer

o Change pin

• Exit

Description of ATM Process:

Enter Pin *This step applies only to the user. They will be asked to enter their pin number in the ATM. It will be securely trasnmited to the bank to grant acces to the money in the account.*

Withdrawal Amount - *This applies to both the user and the banker. The user is able to chose how much money they are going to withdrae based off options on the ATM screen. The banker is able to see the Amount of money that the user is attempting to withdraw. Only the user can change the amount that is going to be withdrawn.*

Account Verification: *This Applies to only the banker. They are able to view transaction history and the account credentials and access if the withdrawal that is taking place in the correct customer.*

Receive Money: *This applies only to the user. Once the transaction has been processed, the user will be able to pick up the money from the ATM machine. The Amount withdrawn should be equal to the amount requested on the ATM screen*

Q.7: Suggest how an engineer responsible for drawing up a system requirements specification might keep track of the relationships between functional and non-functional requirements. *(8 marks)*

Answer:

One method to track the relationship between functional and non functional requirements may include a type of flowchart. This chart could go from one functional requirement to the next logical functional requirement with the ability to branch off if there are other similar requirements.

The non -functional requirement could then be written next to which ever functional requirement they are related to. The non- functional requirements may be repeated if they relate to multiple functional requirements.

For example,

The user needs to search for the candidate list for the interview.

- It is a functional requirement.

That the search should return all the list of candidates who are attending the interview.

- It is a non-functional requirement.

End Paper