1. You, as an appointed software engineer are in-charge for designing an online management system for Study Point Tutor center. Currently the tuition center has been using manual way to manage the center and now has decided to automate all their registration, classes scheduling, attendance, and payment processes.

Assuming that you are adopting Component Based Software Engineering. Identify and explain 4 activities that must be carried out in developing the proposed Study Point Tutor online management system.

* **Component Qualification** - Use a process of discovery and analysis to qualify each component’s fit in architecture and requirements. Ensures that a candidate component will perform the function required
* **Component Adaptation** - Components adapted to meet the needs of architecture or to remove architectural mismatches, and be replaced by more suitable components. In reality, qualified component for use may exhibit conflict in one or more of the areas.
* **Component composition** - Assembles qualified, adapted, and engineered components to populate the architecture established for an application. An infrastructure must be established to bind the components into an operational system.
* **Component update** - When requirements for the system change. Update the components if requirements change / new release available

1. Highlight the difference among *black-box wrapping, white-box wrapping* and *grey-box wrapping* technique in Component Adaptation of CBSE.

* **white-box wrapping**

– examines the internal processing details of the component and makes code-level modifications to remove any conflict.

– Not for the case when COTS components are used.

* **gray-box wrapping**

– applied when the component library provides a component extension language or API that enables conflicts to be removed or masked.

* **black-box wrapping**

– requires the introduction of pre- and post-processing at the component interface to remove or mask conflicts.

1. Discuss 2 advantages and 2 obstacles of CBSE approach on software development.

**2 advantages:**

* Improve quality - provides a high-performance & more reliable end product as components have been used many times, each time getting more refined and reliable as they are reused and re-tested
* Increase productivity - reduces the time required for code development, documentation, system modeling, and planning
* Save Cost - reduces development cost from scratch & testing overhead

**2 obstacles**

* Little training is available to help s/w engineers & managers to understand & apply reuse
* Many s/w practitioners continue to believe that reuse is “more trouble than it’s worth”.
* Few s/w companies to provide incentive to reusable components program
* Many companies continue to encourage of s/w development methodologies which do not facilitate reuse

1. Running Boy For You (RuBy4U) is a company that allows users to call in to select food and beverages from a list of twenty-five local restaurants and six fast food restaurants. RuBy4U will deliver the order with minimum charges from RM1 to RM5 depending on the delivery distance. Recently the owner of RuBy4U is planning to market its business online within a month. As a newly recruited software engineer in RuBy4U, you are to handle the system development all by yourself.

Suggest 4 functional categories of computer-aided software engineering (CASE) tools to help you to automate the software engineering process in accelerating the RuBy4U online system development. Explain the tools by giving 1 example for each category.

* Business Process Engineering Tools: e.g. IBM RSA, Microsoft Project
* Process Modeling and Management Tools. E.g.. Microsoft Visio
* Data Modeling Tools: e.g. SQL DBMS
* Project Planning/Management Tools: e.g JIRA, Microsoft Excel
* Risk Analysis Tools e.g. Acumen Risk
* Requirements Tracing Tools: e.g Microsoft Excel
* Metrics & Management Tools: e.g. COQUALMO
* Prototyping Tools: e.g VB
* Editing Toos: e.g. Microsoft Word
* Method Support Tools: e.g IBM RSA
* Language Processing Tools: e.g. DREAMWEAVER
* Debugging Tools: e.g. DREAMWEAVER
* Testing tools: e.g. Scribus
* Web Development Tools: e.g. FrontPage
* Software Configuration Tools: e.g. SQL Server DB change mangement

1. A local television programs production company (Longevity Pte. Ltd.) is planning to develop an online real time system which allows users to watch television programs online (OnlineWatch.com). The website allows users to login and watch three local television channels’ programs archived for one month. You have successfully bid the project for your software organization and will kick start the project in a month time
2. Assume that this project is adopting Computer-Aided Software Engineering (CASE). List and explain 4 appropriate CASE tools that can assist you in this project. You must select the tools from different functional classification of CASE tools.

* Business Process Engineering Tools: e.g. IBM RSA, Microsoft Project
* Process Modeling and Management Tools. E.g.. Microsoft Visio
* Data Modeling Tools: e.g. SQL DBMS
* Project Planning/Management Tools: e.g JIRA, Microsoft Excel
* Risk Analysis Tools e.g. Acumen Risk
* Metrics & Management Tools: e.g. COQUALMO
* Editing Toos: e.g. Microsoft Word
* Method Support Tools: e.g IBM RSA
* Documentation tools: e.g. Scribus
* Software Configuration Tools: e.g. SQL Server DB change mangement

1. Longevity Pte. Ltd. would like to reuse some screens (user interface) from their proprietary system. Briefly explain the 4 activities involved in Component-based Software Engineering (CBSE) to the customer.

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