

1. Ladre is a small scaled family business found in 2000s which selling computers' hardware and software. Recently the shop owner plans to improve the business by selling the products online. He has contacted your company as a suitable software house to handle this project.

Discuss the 3 main activities that your team would perform for the architectural design of the above project.

### 1. System organization

System is structured into by number of sub-systems and communications between sub-systems in share data how they are distributed and interface with each other

### 2. Modular decomposition

The decomposition of sub-systems into modules by using (object-oriented decomposition/ function-oriented decomposition)

### 3. Control modeling

Sub-systems must be controlled so that their services are delivered to the right place at the right time by using (centralized control)

2. You, as a project manager have been assigned to lead project team e-learning system for a college. The main functions of the e-learning system include programme registration and payment, on-line assessment, assignment submission, uploading and downloading course materials. The main campus of the college is located at Penang and the other branch campuses are located in Melaka, Kelantan and Sarawak.

Recommend and draw an appropriate *system organization* model for the above project. Explain the model and justify your recommendation.

Client-server (more heavy transaction) with repository model

Client server - to avoid overloaded situations due to heavy transactions, example make payment, submit assignment periods.

Repository - need to store and share large data like student detail, staff detail, course detail etc.

3. Differentiate the following pairs of *control model*:
  - a. Call-return model and manager model

#### Call return model

- a top down subroutine model
- applicable for sequential systems

#### Manager model

- a system component is designed as system manager
- applicable for concurrent systems

- b. Interrupt-driven model and broadcast model

**Interrupt driven model**

- Used in real-time systems
- Interrupts are detected by an interrupt handler, it will be passed to some other component for processing

**Broadcast model**

- an event is broadcast to all sub-systems. Any sub-system which can handle the event may respond to it.
- effective in integrating sub-systems distributed across different computers on a network

4. Giving reasons for your answer, suggest an appropriate system organization model for the following systems:

- a. An automated ticket issuing system used by customers at a cinema.

**Repository model**

- need store and share movie details, showing time details, cinema detail

- b. A Sales and Inventory System used by Sales Staff and Inventory Staff in an organization

**Repository model (sharing huge number of data)**

Client server (when have lot of transaction)

Client server with repository

5. A Sales Invoicing System will firstly take the customer order transactions and itemize unit price from the database, followed by totaling up all the items ordered prices to calculate the invoice amount. The system will then deduct the invoice amount with a discounted rate (if any) and this will produce the final invoice amount. Then the system will update the customer account and finally print the invoice for each customer.

Giving reasons for your answer suggest a suitable control model for the above system. You may state any assumptions to support your answer.

**Call return model**

- sequential systems where firstly customer order transactions and itemize unit price from database, totaling up all the items ordered prices to calculate the invoice amount

6. XinJin Press is a newspaper company which started its first printed newspaper in 1960s. Recently, you were invited to attend a discussion meeting with XinJin Company's IT department. The main agenda of the meeting is to decide on the maintenance of some of their legacy systems. One of their legacy systems is a text file storage server which stores large amounts of the newspaper draft contents (original story from the interview, news draft, supporting images or news, and et cetera). The file storage system has no documentation and no proper module design. The draft contents might be useful in the future to trace the original story.

Assuming that XinJin IT department decided to re-engineer the legacy system. Propose 1 system organization/structuring design model. Explain and justify your answer.

#### **Repository model**

- Need to store and share a large amount of data which is a text file storage server which stores large amounts of the newspaper draft contents(original story from the interview, news draft, supporting images or news, and et cetera).
  - The company has a large pool of data because the first printed newspaper was in the 1960s.
7. Easy2Study.com is a global marketplace for teaching and learning online where students are mastering their skills. The system allows the students to search, view available courses, purchase, make payment, and join the courses. An access to start the course will be given once the payment is confirmed. Easy2Study.com is planning to extend their online system on mobile platforms to attract more customers as mobile users are increasing extremely.

Suggest and explain 1 suitable system organization model and 1 control modeling model for the Easy2Study.com mobile application. Discuss your answers.

#### **Client-server with repository**

##### **Manager model**

- concurrent system
- where one sub-system acts as system manager and has overall responsibility for control and starts and stops other subsystems which handle searching, to view available courses, to purchase, make payment , and join the courses. Subsystems can be concurrent systems.