



Uva Wellassa University, Sri Lanka
Faculty of Science & Technology
Computer Science & Technology Degree Program
1st Semester Examination February/March 2012
CST 324-2 Middleware Architecture



Time Allowed: Two(02) hours

Number of Questions: Four(04)

Number of Pages: Four (04)

Instructions:

Answer All questions

All questions carry equal marks

Q1.

ABC Company has three branches; one in Colombo, one in Galle and one in Kandy. Each branch is having they are own database system. But these three systems cannot sync with each other because database structures are not similar. Therefore they have to maintain their information separately. Finally they have decided to sync these three systems using existing Middleware technologies.

Colombo Brach

Personal_data_table

First_Name	Second_Name	Address_One	Address_Two	City
Amal	Perera	#45	follower road	Colombo 07
Nuwan	Dissanayake	# 35	main street	Nugegoda

Kandy Branch

Personal_data_table

First_Name	Second_Name	Address
Melan	Nimesh	34 , main street , Matara

Galle Branch

personal_data_table:

Name	Address
Dilshan Ekanayake	34 , main street , Galle
Gihan Perera	66, richmond hill road, Galle

Propose a system that would sync all these three database systems without changing the existing databases

Q2.

Service-Oriented Architecture (SOA) is a set of principles and methodologies for designing and developing software in the form of interoperable services. These services are well-defined business functionalities, that are built as software components (discrete pieces of code and/or data structures) or that could be reused for different purposes. SOA design principles are used during the phases of systems development and integration.

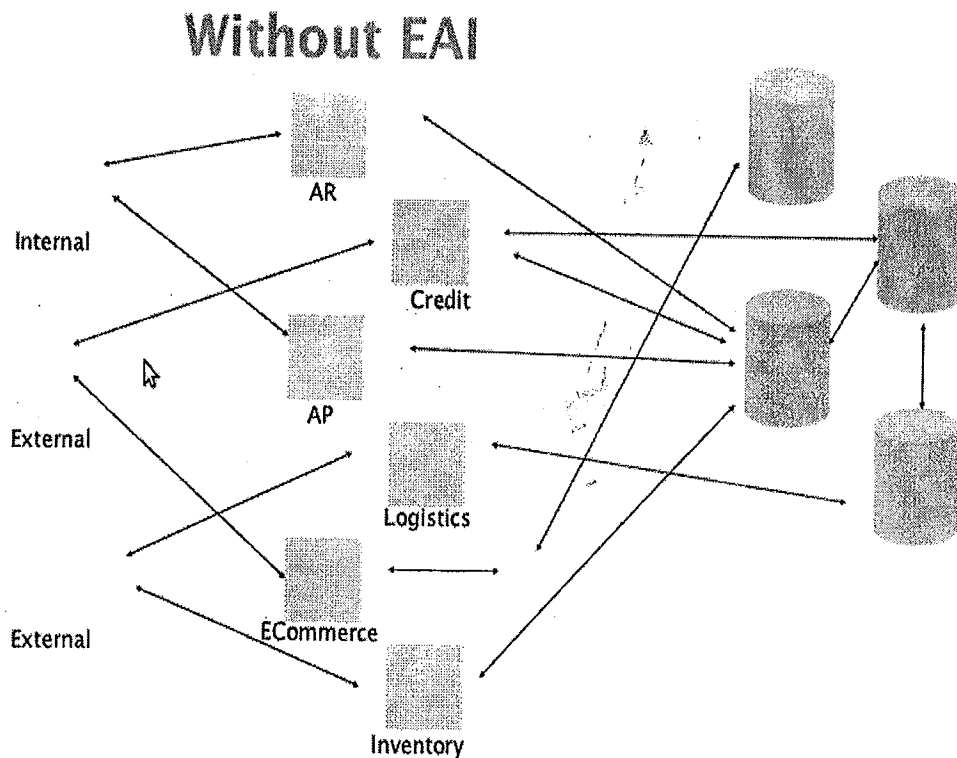
- (a) Describe the characteristic of Service-Oriented Architecture(SOA)
- (b) Describe the anatomy of a web service
- (c) What are the two mechanisms to develop a web service?
- (d) Briefly describe the above mechanisms
- (e) What is SOAP? And what are the main sections in a SOAP message?
- (f) An **Enterprise Service Bus (ESB)** is a software architecture model used for designing and implementing the interaction and communication between mutually interacting software applications in Service Oriented Architecture. "What are the main purposes of having **Enterprise Service Bus (ESB)** in SOA system?"



Q3.

Enterprise Application Integration (EAI) is an integration framework composed of a collection of technologies and services which form a middleware to enable integration of systems and applications across the enterprise (Wikipedia)

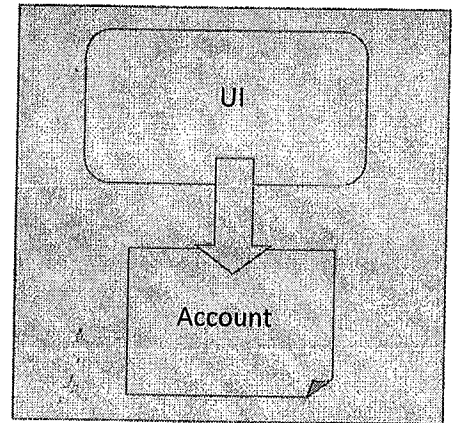
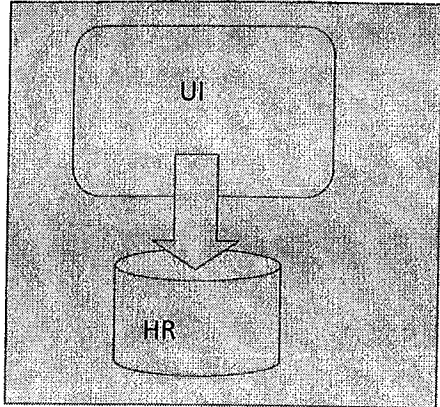
- (a) Describe Enterprise Application Integration in your words
- (b) What benefits can be obtained by introducing an EAI for large scale Enterprise System?
- (c) Introduce an EAI layer to the following system and re-draw the diagram



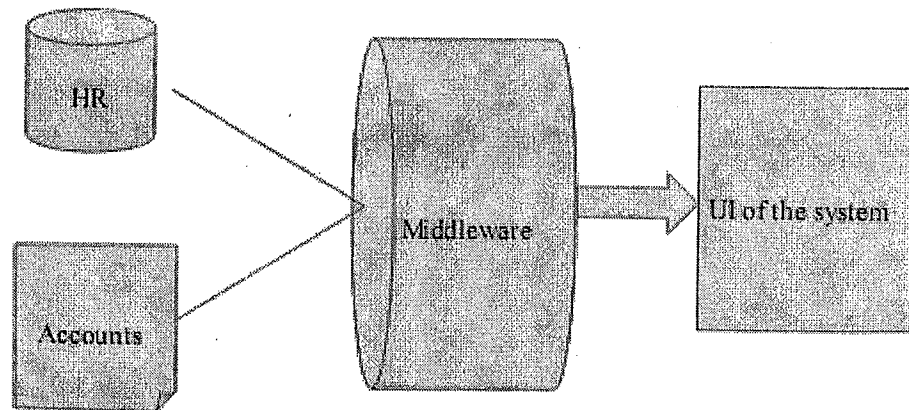
- (d) What is the most suitable software architecture to implement the above system? Give reasons for choosing that software architecture.
- (e) Describe how to use "Service Oriented Architecture"(SOA) to implement the above system

Q4.

The ABC company has a Human Resources (HR) and an Accounting departments; Accounting department saves its data into a file. HR department uses a simple database system to save their data. Top Management took a decision to develop a single system for both departments but they need to use existing data without doing any changes. Propose a middleware layer to achieve this task.



New system should look like the following



Explain how to implement this middleware bus