COMP0022: Database and information systems (PG – Term 1)

Distributed databases exercises

1. Using the 'Shop' database: This database consists of the following tables:
   Customers (custID, firstName, familyName, town, state, [country])
   Items (itemID, description, unitcost, stocklevel)
   Orders (orderID, custID, date, shippingAddr, paymentInfo)
   Lineitems (orderID, itemID, quantity, despatched)
   Supplieritems (supplierID, itemID)
   Suppliers (supplierID, supplierName, supplierAddress, phoneNo)

   We would like to distribute the shopping database.

   a. Assume that, currently, this shopping website is available in 5 different countries. There exist offices in each country for managing the item catalog and customer inquiries for items sold/customers registered in that country. Each office works with suppliers to add/update items in the catalogue. Some suppliers only sell items in one country while others sell an item in multiple countries, but often versions specific to that country (so would be a new entry in the Items table).

      Propose a scheme for fragmentation, allocation, and replication for a distributed Shop database.

   b. Assume instead that this shopping website is only available in one country. All customer purchases go through a central server located at Site 1. Site 2 is an analysis division that looks at all customer, order, and item information and produces reports. Site 3 is a customer service office that needs information on customers and orders to address customer complaints. Site 4 handles information about suppliers and stock.

      Propose a scheme for fragmentation, allocation, and replication for a distributed Shop database in this scenario.

2. How would each of the proposed distributed systems handle the following operations?

   a. Process a new order from a single customer.
   b. Update information about a supplier.
   c. Update item prices to new ones provided by a supplier.