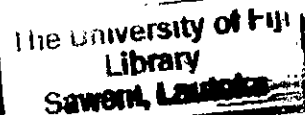




The University of Fiji

School of Science and Technology

Department of IT and Computer Science



ITC415

Advanced Database and Data Warehousing

Semester I, 2011

FINAL EXAMINATION PAPER

Time Allowed: 3 hours [10 minutes extra allowed for Reading the Paper]

Total Marks: 60

Instructions

- There is 8 Questions, all of which are compulsory. Answer all questions in the Answer Booklet.
- For these questions write your answer on the answer sheets provided by the instructor. The marks allocated for each of the questions are written in brackets.
- Marks will be given for working. Write your statements and working clearly in to gain maximum marks.
- You may ask for extra sheets from the supervisors.
- Do not forget to write your name and ID number on this page.
- This booklet contains 6 pages including this page. Hand in both the question paper and your answers sheets.

Student Name:

Student Id:

GOOD LUCK!

Questions:

1. Introduction to Data Warehouse

[2+2+4 = 8 marks]

- a) What is the key difference between a data warehouse and a front-office transactional system?
- b) In your own words, answer the question "Why do I need to get the data from the source system into the DDS and then query the DDS? Why don't I query the source system directly?"

..

2. Data Warehouse Architecture

[3+2+8 = 13 marks]

- a) What is a dimensional data mart?
- b) Explain the main difference in the following data warehouse architectures: Single DDS, NDS + DDS, ODS+DDS, Federated Data Warehouse?

3. Data Warehouse Development Methodology

[3+3 = 6 marks]

- a) Describe the waterfall methodology for data warehouse development and sketch the waterfall methodology with infrastructure setup and project management?
- b) Describe the iteration methodology for data warehouse development and its advantage over the waterfall method?

4. Functional and Nonfunctional Requirements

[2+2+3 = 7 marks]

- a) What are Functional and Nonfunctional Requirements, give an example?
- b) In regards to business operations, what is an event, status, level and role?

5. Data Modeling

[5+7 = 12 marks]

- a) What are the steps in dimensional modeling?
- b) An online order wine company requires the designing of a datawarehouse to record the quantity and sales of its wines to its customers. Part of the original database is composed by the following tables:

CUSTOMER (Code, Name, Address, Phone, BDay, Gender)
WINE (Code, Name, Type, Vintage, BottlePrice, CasePrice, Class)
CLASS (Code, Name, Region)
TIME (TimeStamp, Date, Year)
ORDER (Customer, Wine, Time, nrBottles, nrCases)

Note that the tables represent the main entities of the ER schema, thus it is necessary to derive the significant relationships among them in order to correctly design the data warehouse.

Goal:

Using Dimensional Modeling techniques, design a data warehouse for the wine company

Questions:

1. Design a conceptual schema for the DW.
2. What facts and dimensions do you consider?
3. Design a Star Schema or Snowflake Schema for the DW.

6. Assuring Data Quality

[4+3+4+4+3 = 18 marks]

- a) Why is data quality important in data warehousing?
- b) What are the three choices of what to do when a data quality rule is violated?

7. Metadata and Building Reports

[3+3+3 = 9 marks]

- a) In data warehousing terms, what does metadata contain? State atleast four out of the seven types of DW metadata.
- b) Why do we need metadata?

8. Multidimensional Database

[4+4+4+2 = 14 marks]

- a) What is a multidimensional database, and explain its structure?
- b) Draw a MDB with three dimensions, customer, product and sales and the cell stores: cost, revenue, and profit?

The End