

System Analysis and Design Task

The main focus of this task is on systems analysis and design: **process modeling, conceptual data modeling, interface and dialogue design**. Process modeling involves graphically representing the processes, or actions, that capture, manipulate, store, and distribute data between a system and its environment, or among components within a system. A common form of a process model is a data flow diagram. A data flow diagram is a graphical representation that illustrates the movement of data between external entities and the processes and data stores within a system. Data flow diagramming is one of several structured analysis techniques used to increase software development productivity and it is commonly used today for process modeling. A conceptual data model is a graphical description of organizational data while being independent of any data base management system or other implementation considerations. Entity-relationship (E-R) diagrams are used to show how data are represented in the information system. Interface design focuses on how information is provided to and captured from the users. Dialogue design focuses on the sequencing of interface displays.

Objectives of the task

- 1. To learn the logical modeling of processes using data flow diagrams,**
- 2. To follow certain rules that lead to accurate and well-structured process diagrams,**
- 3. To understand the decomposition of data flow diagrams into lower-level diagrams that helps to strengthen semantics of the diagrams,**
- 4. To control the balance between higher-level and lower-level of data flow diagrams,**
- 5. To check completeness and consistence of the diagrams,**
- 6. To create accurate E-R diagrams for common business situation,**
- 7. To transform E-R diagrams into database relations,**
- 8. To design interface layouts,**
- 9. To design dialog scenarios - the sequence in which information is displayed to and obtained from a user**

FLOWER System Reengineering

Task Description

Your project team was hired to redesign an old fashion data processing system to a new web-based electronic commerce system.

Nursery FLOWER offers a wide range of lawn and garden products to its customers. Nursery FLOWER conducts both wholesale and retail operations. The company is situated in a big area and wholesales its bulbs, perennials, roses, trees, shrubs, and planting accessory products. FLOWER accessories include a variety of fertilizers, plant foods, pesticides and gardens supplies. In the past five years, the company has seen a phenomenal sales growth. Unfortunately, its information systems have been left behind. Although many of FLOWER processing activities are computerized, these activities require reengineering. You are part of the project team hired by the company to renovate wholesale division.

During the requirements determination activity, you discovered that there are three main external entities to FLOWER web-based system: **customers, sales representatives and sales managers**. Customers apply electronically to get access as FLOWER customers **for placing their orders**. Sales representatives may grant permission for trustworthy customers (this process might involve checking customers credit at the bank) to access the system. Customers are using Internet based system **for placing orders** and receiving electronic bills. Sales manager takes control of the products in stock and receives management reports.

One way of sequencing events in this project is as follows:

- 1) A person or company applies for permission to become a customer of FLOWER.
- 2) Sales representative approves customer data and enters customer identification data and password to the system. When customer record is created in the system, a customer electronically receives his/her identification number and password.
- 3) Only FLOWER customers have right to **select** and **order** the products.
- 4) Customers may choose any number of products, which have sufficient amount of items in FLOWER warehouse. If product is ordered, then the manual order processing and electronic invoicing should begin.
- 5) Ordering information is available to customers. If order is not shipped, it can be cancelled or changed. Once the order is shipped, the product inventory is adjusted and order items are pulled from stock in product warehouse.
- 6) Ordered items are manually packed and shipped to the customer.
- 7) The sales and product item in stock reports are created for the sales manager.

Note: you are free to change the sequence of the actions in the system. You are also allowed to enlarge or decrease the number of processes and data flows.

Final Report

A report must be presented in written form with a short description of each diagram and overall purpose of the system-reengineering task (MS Word can be used for this purpose). All diagrams should be documented by using Microsoft Visio (or any other drawing) tool. Final reports are delivered to the teacher before the examination on the announced date.

The final report must contain the following documentation:

- a. A context data flow diagram, illustrating FLOWER nursery's web-based wholesale system.
- b. A level-0 diagram for FLOWER Nursery wholesale system.
- c. A level-1 diagram for all or 2-3 processes of level-0 diagram.
- d. Entity-relationship (E-R) diagrams (please examine the data flows from the DFD as possible sources for entities. This analysis results and helps to identify general information needs). Construct a logical detailed representation of data. It includes entities, relationships with cardinalities and attributes.
- e. Database design. Transform E-R diagram into relational representations.
- f. Design necessary Screen layout forms and dialogue scenarios for customer.

Creating a data flow and E-R diagrams with MS Visio

For **data flow diagramming** you should use Gane and Sarson DFD symbol sets that you can find in the following way:

- Start Microsoft Visio
- Choose 'New page'
- Go to icon 'stencils'
- In the list choose 'Software'
- Choose Gane and Sarson (click)

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- Draw!

To draw **E-R diagram** go to Block Diagram stencil and choose 'Basic Shapes'. You can also use another stencils to find appropriate notations.

For **interface screen layouts** you can use Software stencil and choose 'Window User Interface'.

For drawing dialogues you can use Database stencil and choose 'Entity Relationships'.

More information about the project tasks and about assessment of diagramming quality you will get during the course. Skype meetings are available with a teacher. You can get feedback sending diagrams to the teacher if you have questions.

Good luck!
Prima