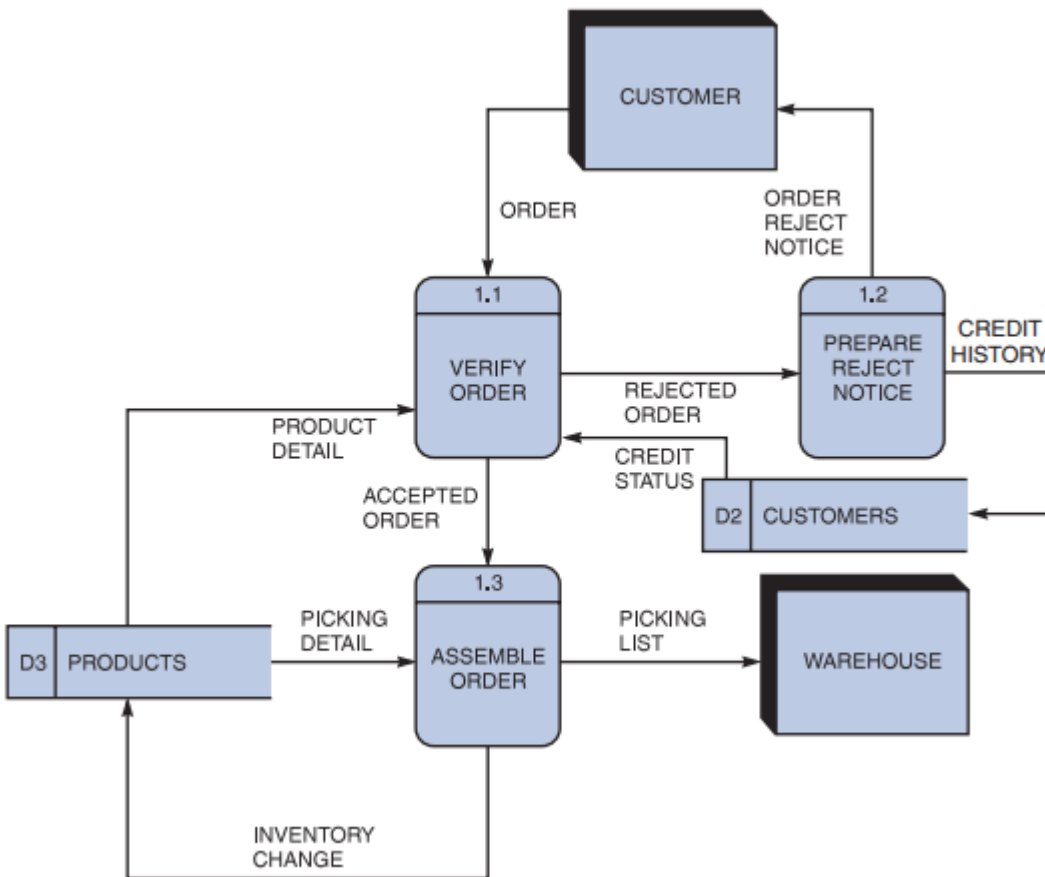


Question 1 [28]

1.1 Name the four main symbols used to draw data flow diagrams (DFDs). (4)

- i. Process Symbol
- ii. Data Flow Symbol
- iii. Data Store Symbol
- iv. Entity Symbol

1.2 Draw Diagram 1 DFD that shows the details of the FILL ORDER process in the ORDER SYSTEM (of Figure 5-13 on page 155) found on page 156 in Figure 5-14 of your prescribed book. NB: Only draw figure 5-14. (4)



1.3 Define each of the symbols you named in 1.1 and give any two names of examples of each using the diagram you drew in 1.2. Use a table, such as the one below to present your answer. (8)

Symbol name	Definition	Examples
Process Symbol	A process receives input data and produces output that has a different content, form, or both.	1. Verify order 2. Assemble Order
Data Flow Symbol	A data flow is a path for data to move from one part of the information system to another.	1. Order 2. Accepted order
Data Store Symbol	A data store is used in a DFD to represent data that the system stores because one or more processes need to use the data at a later time.	1. Customers 2. Products
Entity Symbol	A DFD shows only external entities that provide data to the system or receive output from the system.	1. Customer 2. Warehouse

1.4 Describe, in some details, what Levelling is in terms drawing DFDs. Then use Figures 5-13 and 5-14 on pages 155 and 156 respectively, to give an example of how this technique can be done. Do not draw the two figures. (5)

Levelling is the process of drawing a series of increasingly detailed diagrams, until all functional primitives are identified. A context diagram gives an overview therefore it should be split into major processes which give greater detail. Each major process is further split to give more detail. If a DFD is too detailed it will have too many data flows and will be large and difficult to understand. Therefore, start from a broad overview. Expand the details - Idea similar to using procedures and linking these with a main program. Each DFD must deal with one aspect of a big system

Figure 5-13 shows diagram 0 for an order system, with the FILL ORDER process labelled as process 1. Figure 5-14, which provides an exploded view of the FILL ORDER process. FILL ORDER (process 1) consists of three processes:

- i. VERIFY ORDER (process 1.1)
- ii. PREPARE REJECT NOTICE (process 1.2)
- iii. ASSEMBLE ORDER (process 1.3)

Figure 5-14 shows that all processes are numbered using a decimal notation consisting of the parent's reference number, a decimal point, and a sequence number within the new diagram. In Figure 5-14, the parent process of diagram 1 is process 1, so the processes in diagram 1 have reference numbers of 1.1, 1.2, and 1.3.

1.5 Describe in some details what Balancing is in terms drawing DFDs. Then use Figures 5-13 and 5-14 on pages 155 and 156 respectively, to give an example of how this technique can be done. Do not draw the two figures. It is intentional that you do not use Figures 5-15 or 5-16 to answer this question though the textbook uses these to explain the concept. (3)

A process used to maintain consistency among an entire series of diagrams, including input and output data flow, data definitions and process descriptions.

Example: In Figure 5-16, the FILL ORDER process receives an ORDER from the CUSTOMER entity and returns the ORDER REJECT NOTICE. It also produces a PICKING LIST which is sent to the WAREHOUSE entity.

Balancing means that even when the process, in this case FILL ORDER, is expanded in detail, the inputs and outputs of the more detailed diagram, in this case Figure 5-17 should remain the same.

This is the case in this situation – just like Figure 5-16, Figure 5-17 receives an ORDER from the CUSTOMER entity and returns the ORDER REJECT NOTICE. It also produces a PICKING LIST which is sent to the WAREHOUSE entity.

1.6 Briefly describe the following with respect to DFDs:

1.6.1 Structured English (2)

Structured English is a subset of standard English that describes logical processes clearly and accurately.

1.6.2 Decision tree (2)

A decision tree is a graphical representation of the conditions, actions and rules found in a decision table.

Question 2 [22]

2.1 The goal of system design is to build systems that are effective, reliable and maintainable. Briefly explain each of these three factors. (6)

- i. A system is reliable if it handles input errors, processing errors, hardware failures or human mistakes.
- ii. A system is maintainable if it is flexible, scalable and easily modifiable.
- iii. A system is effective if it supports business requirements and meets user needs.

2.2 What is Human-Computer Interaction (HCI)? (2)

HCI describes the relationship between computers and the people who use them to perform (business-related) tasks.

2.3 What are the seven habits of successful interface designers? (4)

- i. Understand the business
- ii. Maximize graphical effectiveness
- iii. Think like a user
- iv. Use models and prototypes
- v. Focus on usability
- vi. Invite feedback
- vii. Document everything

2.4 Use the internet to find the ISO 9241-11 standard definition of usability with respect to computer interfaces. (1)

Usability is the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use.

2.5 Why is prototyping important for users during system design? (1)

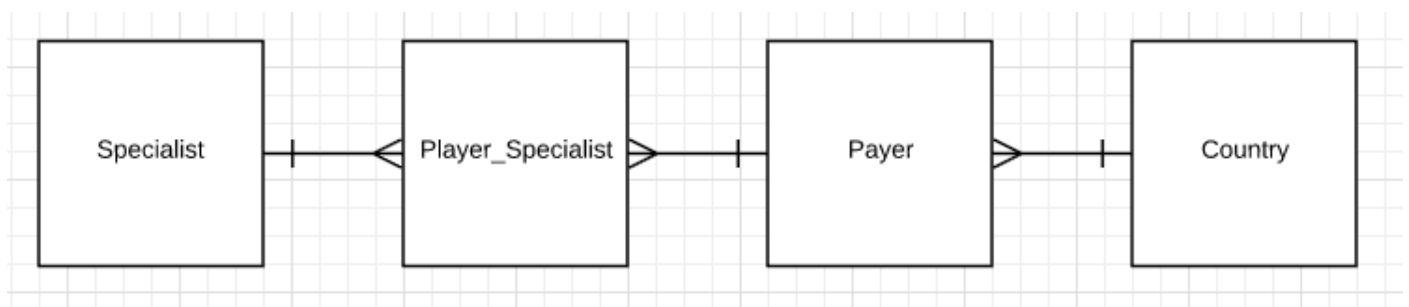
Prototyping allows the users to examine a model that accurately represents system inputs, outputs, interfaces, and processes.

2.6 When designing a user interface you should follow eight basic guidelines suggested by the textbook authors. List these guidelines? (8)

- i. Create an interface that is easy to learn and use
- ii. Enhance user productivity
- iii. Provide users with help and feedback
- iv. Create an attractive layout and design
- v. Enhance the interface, (by including many features such as toolbars, menu bars etc. – optional part)
- vi. Focus on data entry screens
- vii. Use validation rules
- viii. Reduce input volume

Question 3 [16]

3.1 Draw an entity relationship diagram (ERD) for this scenario. The ERD should not contain any many-to-many relationships. Do not include entities that are not in the scope (scenario) provided above. No attributes/fields are required in this section. (8)

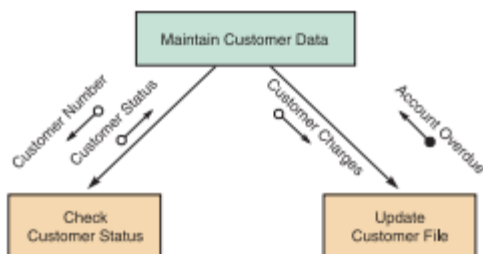


3.2 Create a relational database schema from the ERD in 3.1 showing all tables in 3NF. Each table should include at least three fields. Appropriate primary keys should be used. Primary keys must be underlined and each foreign key should have the letters FK in brackets after it, for instance, xyz (FK). There is no need to show all the steps involved in this process since only the final relational schema will be marked. (8)

- Country (Country_Code, Country_name, County_main-language,)
- Player (Player_ID, Player_first_name, Player_last_name, Player_Age)
- Player_Specialist (Player_ID (FK), Specialist_ID(FK), Player_Specialist_Appointment)
- Specialist (Specialist_ID, Specialist_Area, Specialist_name)

Question 4 [10]

Draw Figure 11-10 found on page 368 of your prescribed book then explain how the main and sub-modules of this structured chart work together, i.e. what each module/sub-module does and how data is interchanged. Note that you are NOT asked to explain this module in terms of a control couple as used in the text book. What is needed is general explanation of how structured charts modules and sub-modules work together and how data is exchanged, using this diagram. (10)



In order to Maintain Customer Data (the main module in this diagram) the Customer Number is input into the Check Customer Status submodule. This submodule outputs the Customer Status Data back to the main module. Customer Charges are input into the Update Customer File submodule which produces the Account Overdue message for the main module.

Question 5 [10]

5.1 System testing (2)

System testing involves the testing of an entire information system and includes all typical processing situations.

5.2 Operational documentation (2)

Operational documentation contains all the information needed for processing and distributing online and printed output.

Explain in some details, each of the following. You may use the internet for more detailed information. Then, show how each can be used to train users of a software package purchased from a vendor.

5.3 Webinar (3)

A webinar (web + Seminar), is an Internet-based training session that provides an interactive experience. A vendor may provide training to a number of users over the internet without a need to bring the trainees in a single venue.

5.4 Tutorial (3)

A tutorial is a series of online interactive lessons that present material and provide a dialogue with users. Vendor may give users access to this tutorial in order to learn how to use or maintain the product.

Question 6 [14]

Briefly describe each of the following with respect to managing system support and security.

6.1 Perfective maintenance (2)

Perfective maintenance involves changing an operational system to make it more reliable, efficient or maintainable.

6.2 Configuration management (2)

Configuration management is a process for controlling changes in system requirements during software development.

6.3 Fault management (2)

Fault management is a timely detection and resolution of operational problems.

6.4 Incremental backup (2)

Incremental back is a fast backup method that backs up only the files that have changed since the last full backup.

6.5 The three interactive tasks of risk management (briefly describe each) (6)

- i. Risk identification: Analyses the organisation's assets threats and vulnerabilities.
- ii. Risk assessment: Measures risk likelihood and impact.
- iii. Risk control: Develops safeguards that reduce risks and their impact.