

Informatics
Teach Yourself Series
Topic 1: Problem Solving Methodology

Contents

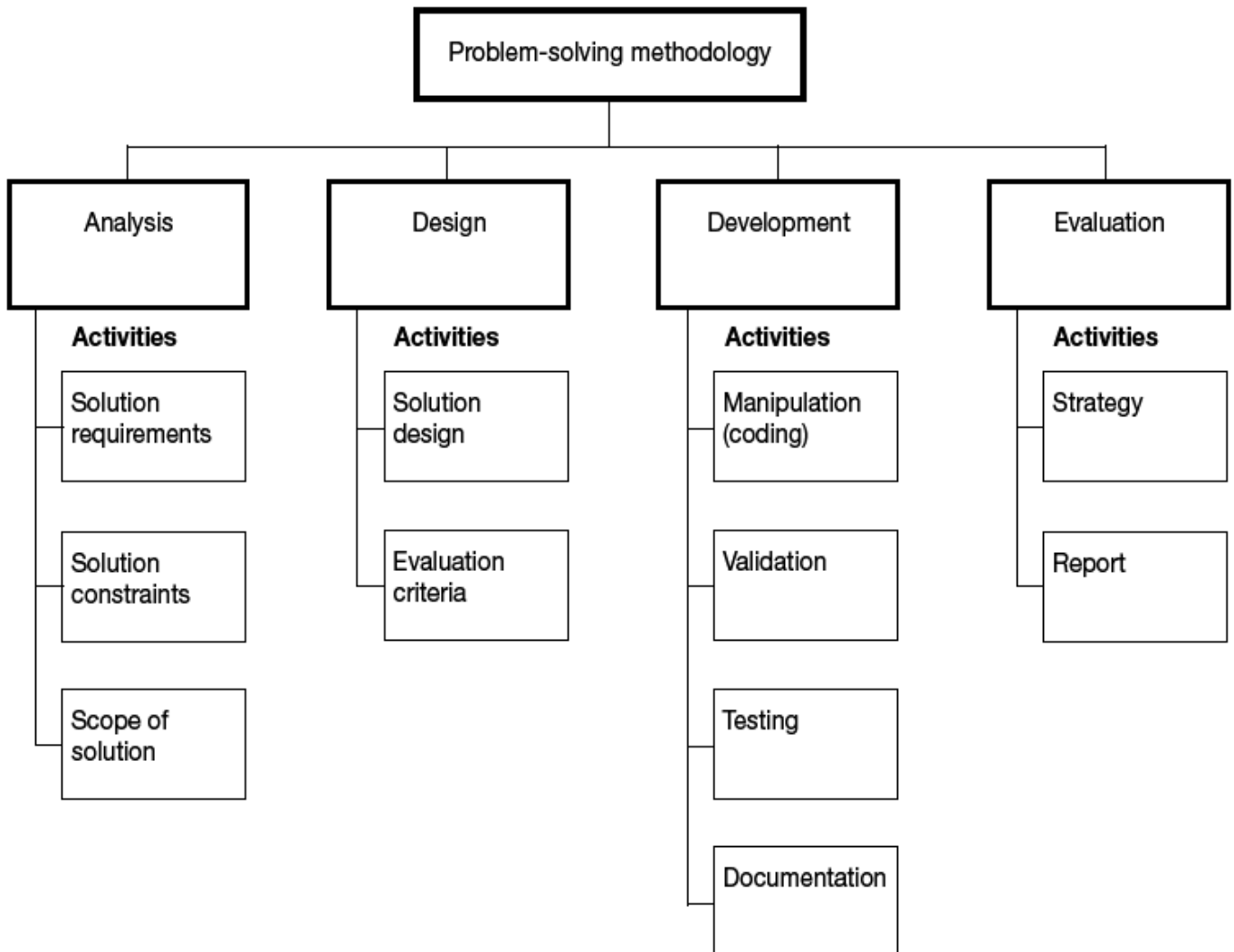
Analysis.....	4
As it appears in Units 1-4.....	4
Solutions to Review Questions	6

SAMPLE

Problem Solving Methodology

The problem solving methodology is used throughout the Computing study design. It refers to the steps taken to solve an information problem.

There are four parts of the problem solving methodology. Each of these will be looked at in detail.



Source: VCAA Information Technology Study Design

Analysis

As it appears in Units 1-4

Analysis is the first stage of the problem solving methodology. Analysis involves the investigation that must be completed before an information problem can be resolved. This stage usually focuses on the 'what' questions:

- What will solve a problem?
- What benefits will the solution provide the user?

This stage involves examining what the problem is, why it exists, determining how the current system works and whether the problem will be able to be solved. During this stage, it is also necessary to identify any constraints that will impact the ability to complete the project and developing a logical design describing what the finished product will be able to achieve.

Understand the problem

In order to solve an information problem, it is helpful to understand why the problem has occurred. This could be due to:

- Inefficiencies
- Incorrect data or information
- Old technology

Determine the solution requirements

Now that the problem is understood, you must determine what needs to be done to solve the problem. Determining the solution requirements includes:

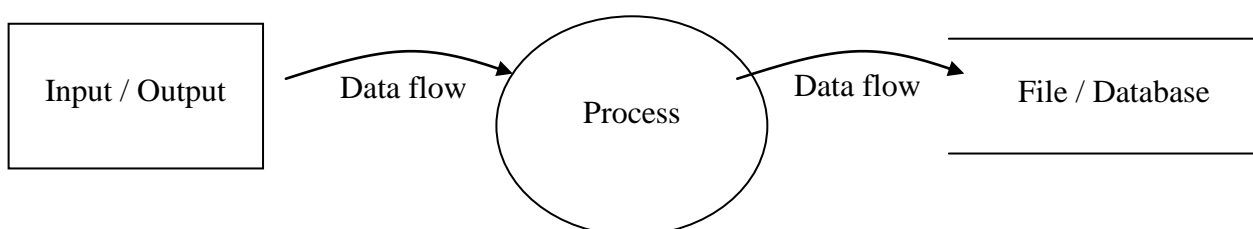
- Understanding the information the solution must provide
- The data that is needed to produce the information
- The functions that the solution requires

The requirements may be functional or non functional.

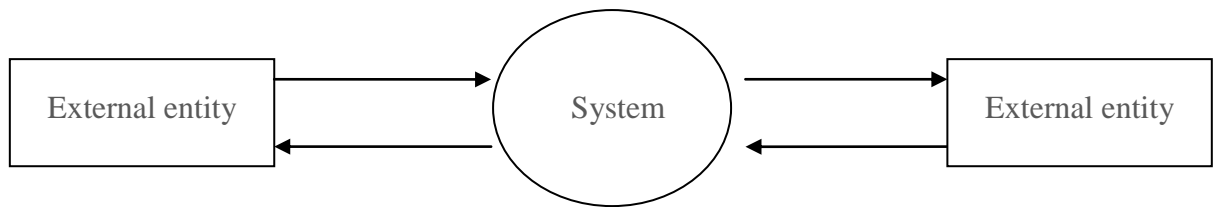
- Functional: what the solution is required to do
- Non functional: the attributes of the solution such as user friendly, reliable, portable, robust, maintainable.

Tools that can be used to help determine the solution requirements include:

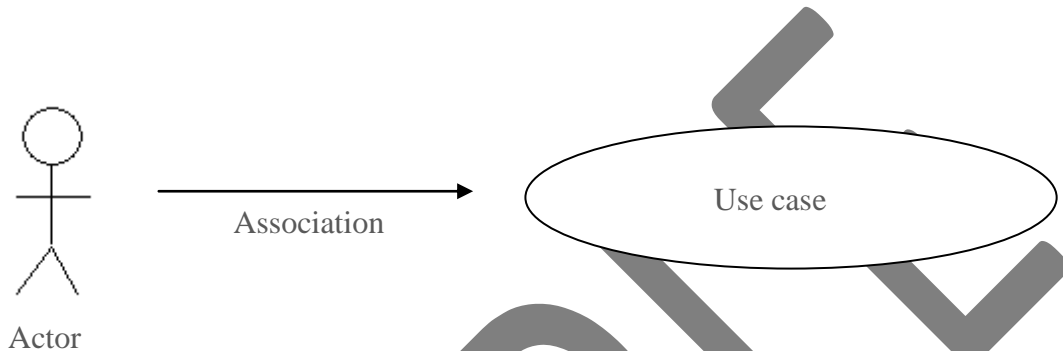
- **Data flow diagrams:** used to show the content and direction of data in an information system.



- **Context diagrams:** high level view of the entire system and how it relates to the external systems.



- **Use cases:** plans to help visualise the system's functional requirements. These are some of the symbols used.



Identify the constraints on the solution

Constraints refer to the restrictions that need to be considered when designing a solution. Constraints may include:

- Cost
- Speed of processing
- Requirements of users
- Legal requirements
- Security
- Compatibility
- Level of expertise
- Capacity
- Availability of equipment

Determining the scope of the solution

Scope refers to the boundaries or parameters of the solution. Scope should consider:

- What the solution can do
- What the solution cannot do
- What the benefits for the user are. This is in terms of both efficiency and effectiveness.

Solutions to Review Questions

1. The correct answer is: B

The reason for this problem is not wasting time, effort or money (A), it is not because of equipment failure (C) and orientation (D) is a design element, not a reason information problems occur. Data about the customers must be incorrect (B).

2. The correct answer is: C

Functional requirements focus on what the solution needs to do (C). The other options refer to non functional requirements: user friendly (A), maintainability (B) and reliability (D).

3. The correct answer is: D

Constraints are the conditions to be considered when creating the solution. The constraints that are listed refer to cost (A), level of expertise (B) and availability of equipment (C). D is something that needs to be taken into account during the project, however, it does not place a restriction as to the solution that is being developed.

4. The correct answer is: C

Entity relationship diagrams (A) are used to show the relationships between tables in a database. Flowchart (B) shows the process being followed in a spreadsheet. Storyboard (D) is used for webpages and does show links to other pages, however, a sitemap (C) is the most appropriate as it is a high level view which shows all pages in one diagram.

5. The correct answer is: A

A rectangle represents a process, which rules out options B and D. A diamond represents a decision, which rules out C and D. The only valid answer is A.

6. The correct answer is: B

Pseudocode is written independent of the programming language. It shows the process the program will follow without having to consider the syntax of the language that will be used to develop the program.