

Information Technology

Top-Down problem solving and Structure Charts

1. **Top down approach problem solving** [The top-down analysis methodology]

If the system/problem being analysed is relatively large and complex, a "divide and conquer" analysis methodology is often used to break the system/problem down into smaller components.

A top-level function or procedure is identified, analysed,.. and then broken down (or "decomposed") into a series of second-level components (each of which may also be further reduced into still lower-level components). A hierarchy of understandable sub functions may be the result of this top-down analysis methodology.

Unfortunately, there is no single formula which will decompose a complex program into individual tasks. The strategy, however, is one of top-down reduction of the processing until a level is reached where each of the individual processes consists of one self-contained task which is understandable and relatively easy to perform.

- Advantages of the Top-Down approach
- Disadvantages of the Top-Down approach
- What is the Bottom-Up approach

The bottom-up approach focuses on the out put required and works upwards from there, through each process needed to produce the solution. When they get to each stage they identify the resources and cost involved in the output. They just keep on working at it until the final output is created.

- What is the Middle-Out approach

This process is always very tempting to use. It works on the idea of having no planing. This usually has 4 broad stages.

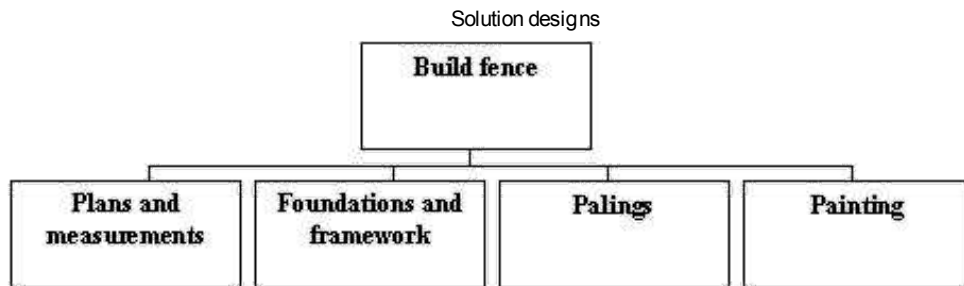
- a. Identifying the information needed and starting production
- b. Bringing in the equipment required
- c. Checking the product and modifying where necessary.
- d. Calculating the cost at the end of it all

2. **Structured Charts** [Overall planning]

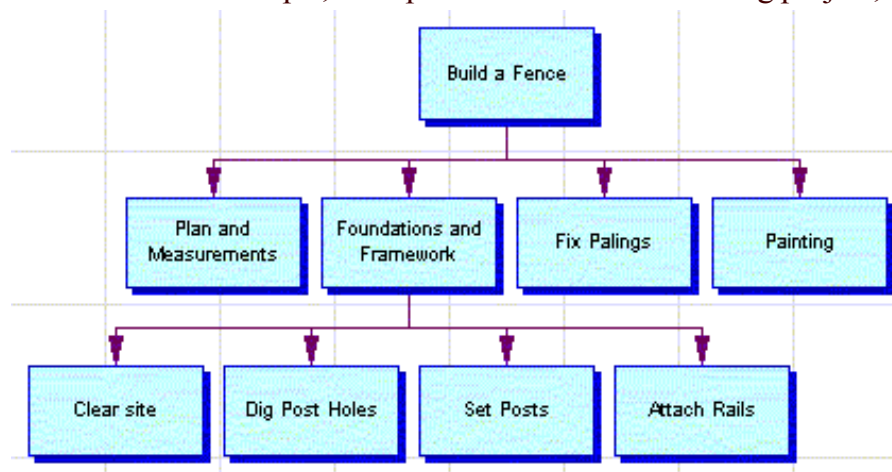
The structure chart shows the main tasks to be completed in the solution. If we were planning for the creation of a computer program, each of the modules would be executed from the main program. The sequence of modules is followed from left to right, reading each layer from top to bottom. The structure chart helps you to visualise the problem and identify the structure of the solution without considering the specifics. A structured chart is like an essay plan.

A structured chart is simply a diagram showing the relationship between all the modules which together make up the solution to the problem.

A Structure Chart example

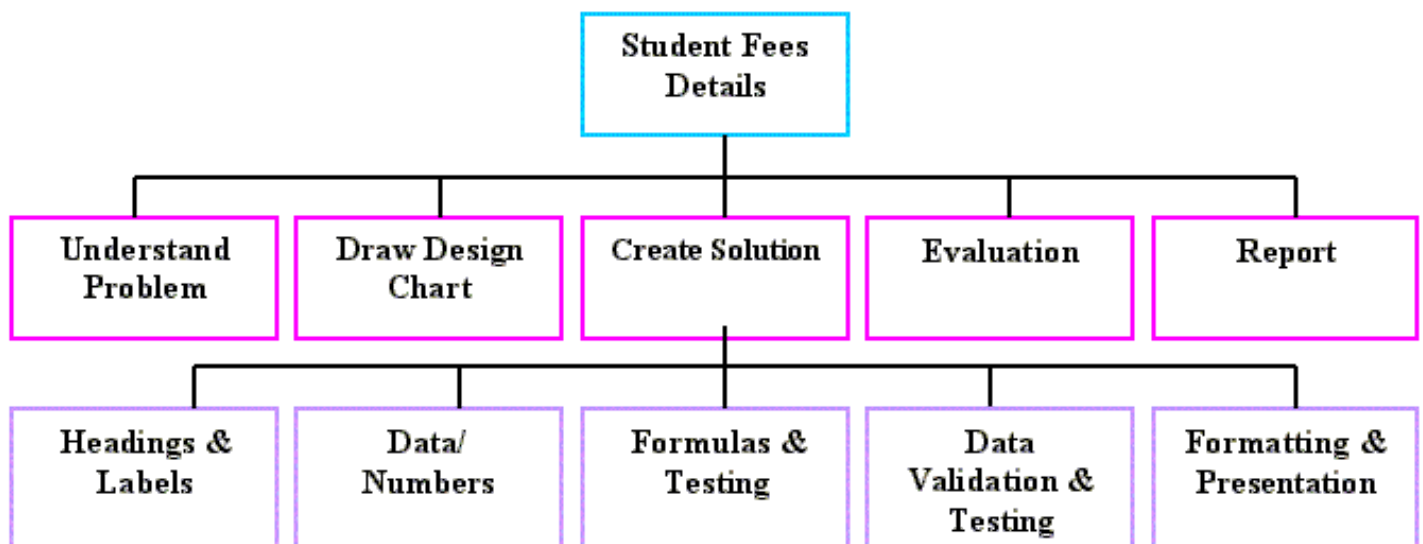


In designing an overall solution, Structured Charts are useful to show what main tasks (modules) need to be done to solve the problem. The drawing must give some idea of the order in which the modules are to be performed and which modules depend on others. It is normal to read a structured chart from top to bottom and from left to right, following the flow lines drawn. Whatever size box you choose, it is important you then be consistent. ALL boxes must be of then same size. For example; an expansion on the fence building project;

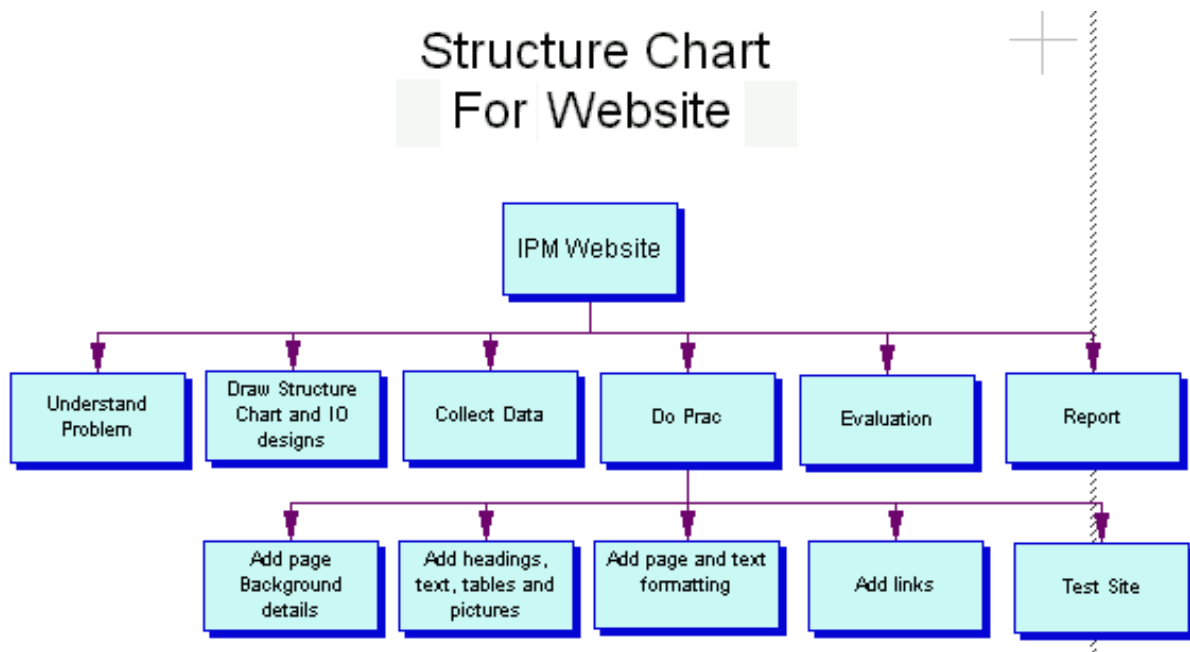


For example; Structure chart representing the processing steps to complete the average **Spreadsheet** information problem in this course (Please note the use of a heading above the chart, marks will be lost without such a heading);

STRUCTURE CHART



For example, structure chart representing the processing steps to complete the average message information problem in this course (Please note the use of a heading above the chart, marks will be lost without such a heading);



Other Structured chart demonstration material: Warning, these are scanned digital images and each may take some time to load up; [Example 1](#), [Example 2](#), [Example 3](#).

3. . Exercises: [Click here view exercises based on these notes](#)