

Fields of Application:-

2 main fields of application can be identified for the simulation.

- * Validation of specification
- * Verification of designs,

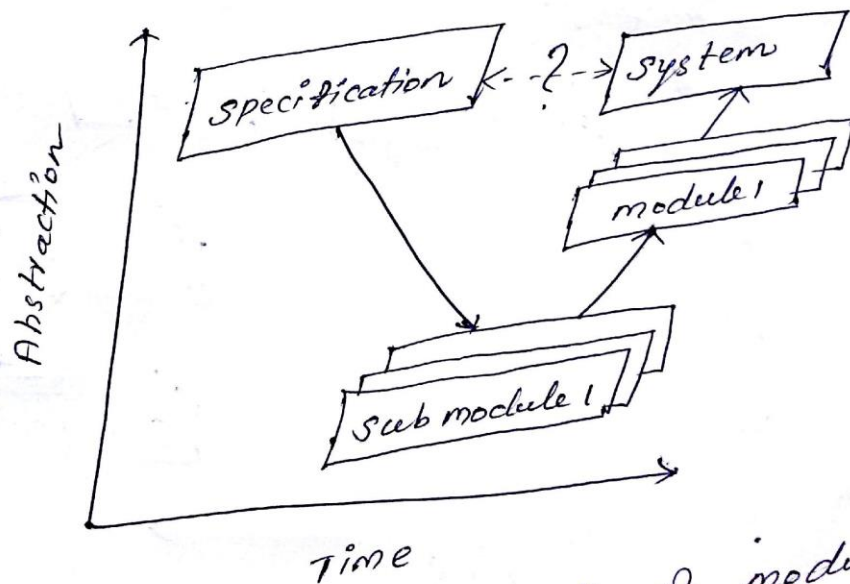
The use of modelling & simulation is closely linked to the underlying design processes. (i.e)

- * Top-down design
- * Bottom-up design.

Bottom-up design:-

- It is the classical method of development of electronic and mechanics.

- Initial point - specification
- Second - Basic components [eg. Transistors, resistors, shock absorbers, joints, etc]
- Combining made in sub modules to form module.



- System formed by combination of modules.

- Advantage of Bottom-up design is that the influences of nonideal implementation is identified at an early stage.

- one problematic aspect is coming upon the specification for the design, after having had to take a 'diversion' via sub modules & modules from the abstract functional description.

- Errors & weaknesses in the system design are not noticed until a late stage, which can bring about considerable costs and delays.

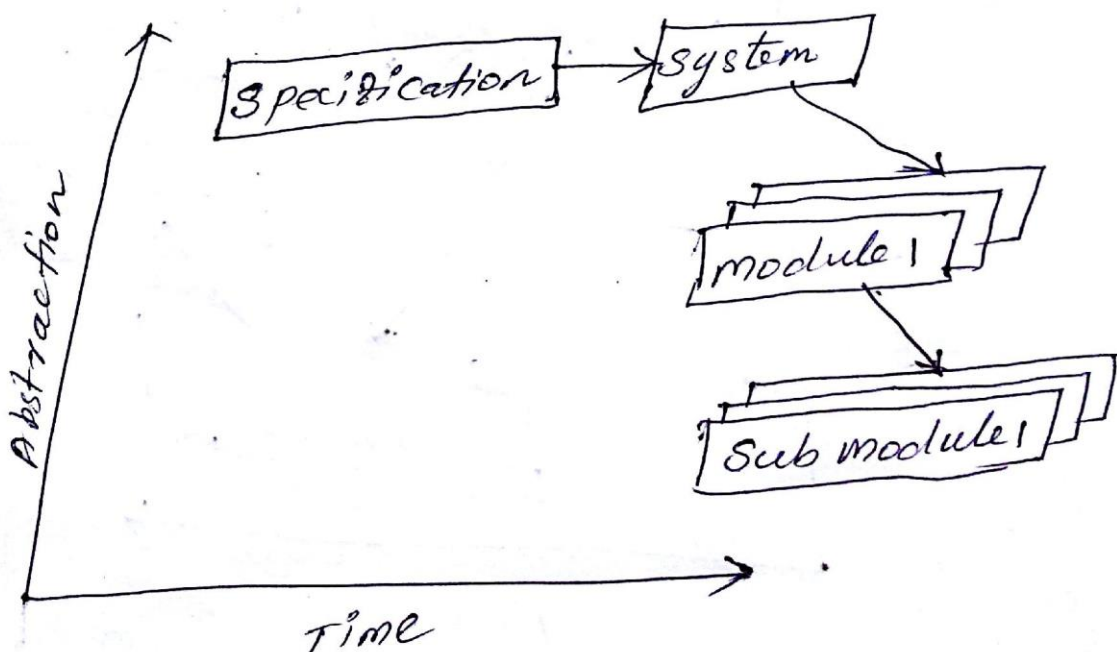
Top-down design:-

- starts from abstract to detailed descriptions

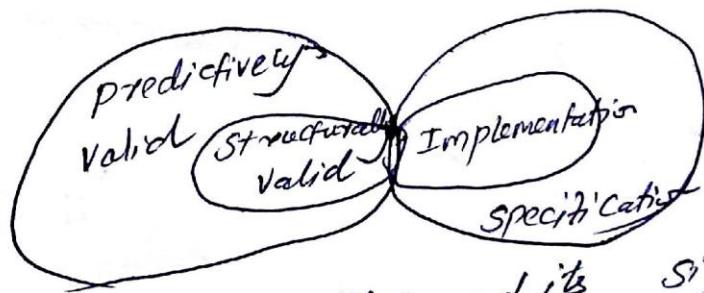
- The starting point is a pure behavioural model, the function of which already covers a good part of the specification.

- The model is successively partitioned & refined until an implementation is obtained.

- using design, ~~the~~ it is directly formulated as a model.



- Errors and weaknesses in the design are noticed early, in contrast to the bottom up approach.
- The implementable part of the specification can be validated by simulations.
- The implementable part of the specification is available as a precisely defined reference for the verification of the design.
- The implementable specification and the models of the individual design stages means that full documentation is available, which however still remains to be supplemented by comprehensive commentary.
- For mechanical, the top-down design sequence is still in the development stage.



Level of validity and its significance.

Relationship of design strategies to modelling:

- In top-down, modelling is used for the specification of the desired behaviour or for the formulation of designs.
- Both case simulation is used for result checking.

modelling for the design:-

- modelling for the checking of technical system designs for each simulation is the classic application case.

Eg. If we consider discretely structured printed circuit boards, then it is slightly less critical than that the circuit is fully checked in advance by simulation.

modelling for the specification:-

- main purpose of a specification is to describe the desired behaviour of a system to be developed and the associated boundary conditions.

- The advantage of this transition lies in the possibility of the verification of the individual design stages against specification. Furthermore, this opens up the opportunity of performing a formal verification against specification.

- modelling for a specification is pure behavioural modelling, which, as is the case for a paper specification, may not anticipate the implementation.