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EMBEDDED SYSTEM DESIGN PROCESS

Design goals

- **D** Performance.
 - Overall speed, deadlines.
- □ Functionality and user interface.
- □ Manufacturing cost.
- Power consumption.
- Other requirements (physical size, etc.)









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LEVELS OF ABSTRACTION

requirements

specification

architecture

component design

system integration





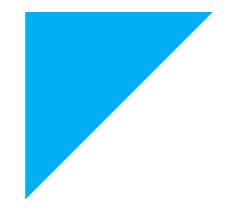




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TOP-DOWN VS. BOTTOM-UP

- **Top-down design:**
 - start from most abstract description;
 - work to most detailed.
- Bottom-up design:
 - work from small components to big system.
- Real design uses both techniques.









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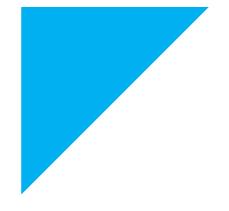


STEPWISE REFINEMENT

□ At each level of abstraction,

we must:

- analyze the design to determine characteristics of the current state of the design;
- refine the design to add detail.









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REQUIREMENTS

- Plain language description of what the user wants and expects to get.
- □ May be developed in several ways:
 - talking directly to customers;
 - talking to marketing representatives;
 - providing prototypes to users for comment.









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FUNCTIONAL VS NON-FUNCTIONAL REQUIREMENTS

- Functional requirements:
 - output as a function of input.
- Non-functional requirements:
 - time required to computeoutput;
 - size, weight, etc.;
 - power consumption;
 - reliability;
 - Performance -Speed
 - Cost Manufacturing Cost and Nonrecurring Engineering cost









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OUR REQUIREMENTS FORM

- name
- purpose
- inputs
- outputs
- functions
- performance
- manufacturing cost
- power
- physical size/weight





