

PROGRAMMING FOR THE INTERNET OF THINGS PROJECT

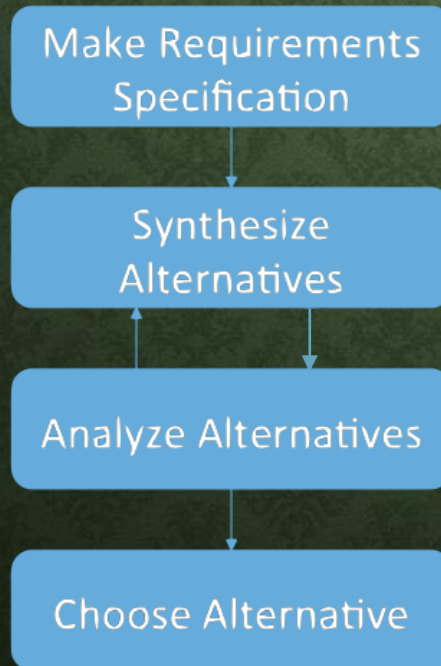
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CAPSTONE DESIGN PROJECT

→ Design and build a more complex system

- Complexity of a design = Sum of complexities of individual components + Complexity of their integration together

- Design process:



REQUIREMENTS SPECIFICATION

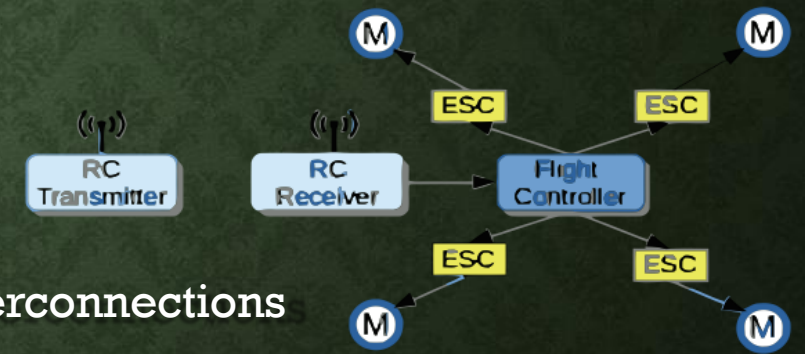
- Behavior of the systems: How the system acts (not implementation)
- Must be understandable by the user:
 - Describe how to use the device
- Must be understandable by the designer:
 - Describe behavior **completely**
 - **Describe rare cases and common cases**
- Real world constraints:
 - ✓ Existing expertise (knowledge)
 - ✓ Competing designs and patents (creativity)
 - ✓ Financial limitations
 - ✓ Legal restrictions

PS: Don't assume background knowledge

DESIGN PROCESS

- System design:

- System-level design, large-scale design → For bigger decisions
- Design based to satisfy all constraints
- Evaluate all possible options and alternatives:
 1. Enumerate
 2. Evaluate
- PS: System block diagram → Show components and basic interconnections



- System decision:

- How will the behavior be divided into HW/SW components?
- Will components be pre-fabricated or built from scratch?
- Do component interfaces match?
- Decision based on constraints

TESTING

- Component testing:

- Testing individual components

- 1. Apply test data

- 2. Observe test results

- PS:** Test data should be complete → Cover all possibilities (+ rare cases)

- Integration testing:

- Test groups of connected components together

- Perform integration incrementally (one piece at a time, individually)