

SIMULATION USE ACROSS THE DESIGN CYCLE

Simulation is for more than validating your designs at the end of a project. It can, and should, be used throughout the development project to improve performance and manufacturability at every step along the way.

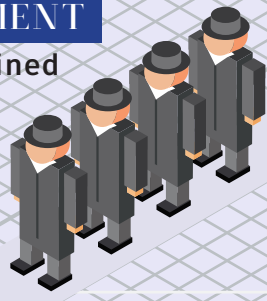
CONCEPT



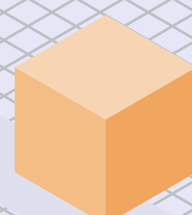
DESIGN

DEVELOPMENT

has not yet gained financial or resource commitment.



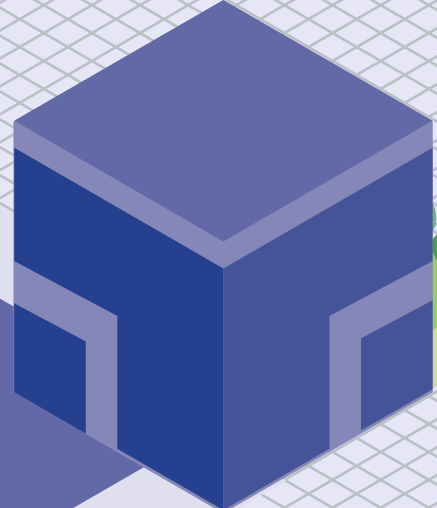
Design is still a concept, from a **2D sketch** to a simplified **3D model**.



OBJECTIVE: UNDERSTAND FEASIBILITY

- ▶ Test the feasibility of many different ideas and concepts. **Eliminate unnecessary alternatives.**
- ▶ **Compare the functionality** of simple or complex ideas and concepts.
- ▶ Understand the boundaries of **what is possible** and **test the viability** of requirements.

OUTCOME:
The best, or at least a feasible, approach to the design solution. With validation of all requirements and constraints as being obtainable objectives.



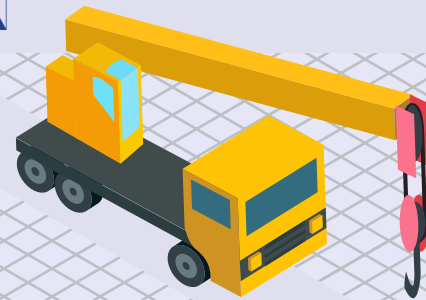
DETAILED



DESIGN

Design has been funded with **FINANCIAL** commitment or allocation of engineering resources.

As project becomes more detailed, **A FLESHED OUT** design is documented.



More informed decisions should result in **BETTER DESIGN OUTCOMES.**

OBJECTIVE:

Guide decisions based on performance and manufacturability.

IN PRACTICE,

This takes the form of making a modification to a design and simulating its performance. This lets you compare your design before and after the change.

DOES IT PERFORM BETTER OR WORSE?
This guidance along the way allows engineers to make the right decision at the right time.

SIMULATION can be applied in detailed design in many different ways.



- Compare different **detailed** design options.
- Parametrically size **specific aspects** of design.
- Select appropriately sized off the **shelf components.**

OUTCOME:
A right-sized design that meets requirements without being over-engineered.

VERIFICATION AND VALIDATION

Final phase before moving to prototyping and testing, **where real money is spent.**



In its fully defined form, **DESIGN** is ready to be realized.

OBJECTIVE:
Ensure design meets all investments before made.

OUTCOME:
A design that will pass through prototyping and testing without failure.

Accuracy is critically important. Test the design in which it will operate.

Correlate simulation results to real-world testing to ensure accuracy.