



From Lab to Scale

Designing with Manufacturing in Mind

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#SEMI_FLEX

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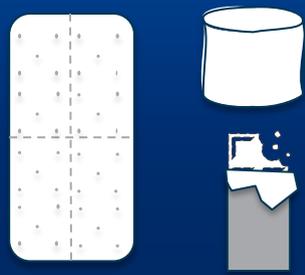
Note:

In the context of this presentation, the word “Design” is the combination of Product Design and Process Design

**Raise your hand if you've made
a S'more within the past year.**

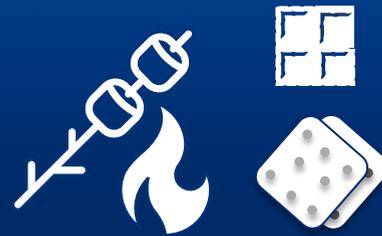


Let's Talk About Your Design.



Ingredients:

1. Graham Cracker
2. Marshmallow
3. Chocolate



Processing:

1. Toasted the Marshmallow
2. Broke the Graham Cracker, Chocolate



Assembly:

1. Put chocolate on Graham Cracker
2. Put Marshmallow on Chocolate
3. Sandwich Graham Cracker

What if I asked you to make 1,000 S'mores?

- How fast can you make them?
- Can you guarantee repeatable results?
- Can you customize to my preferences?
- Can you meet my price point?
- What if I asked for 10k, 50k, or more?



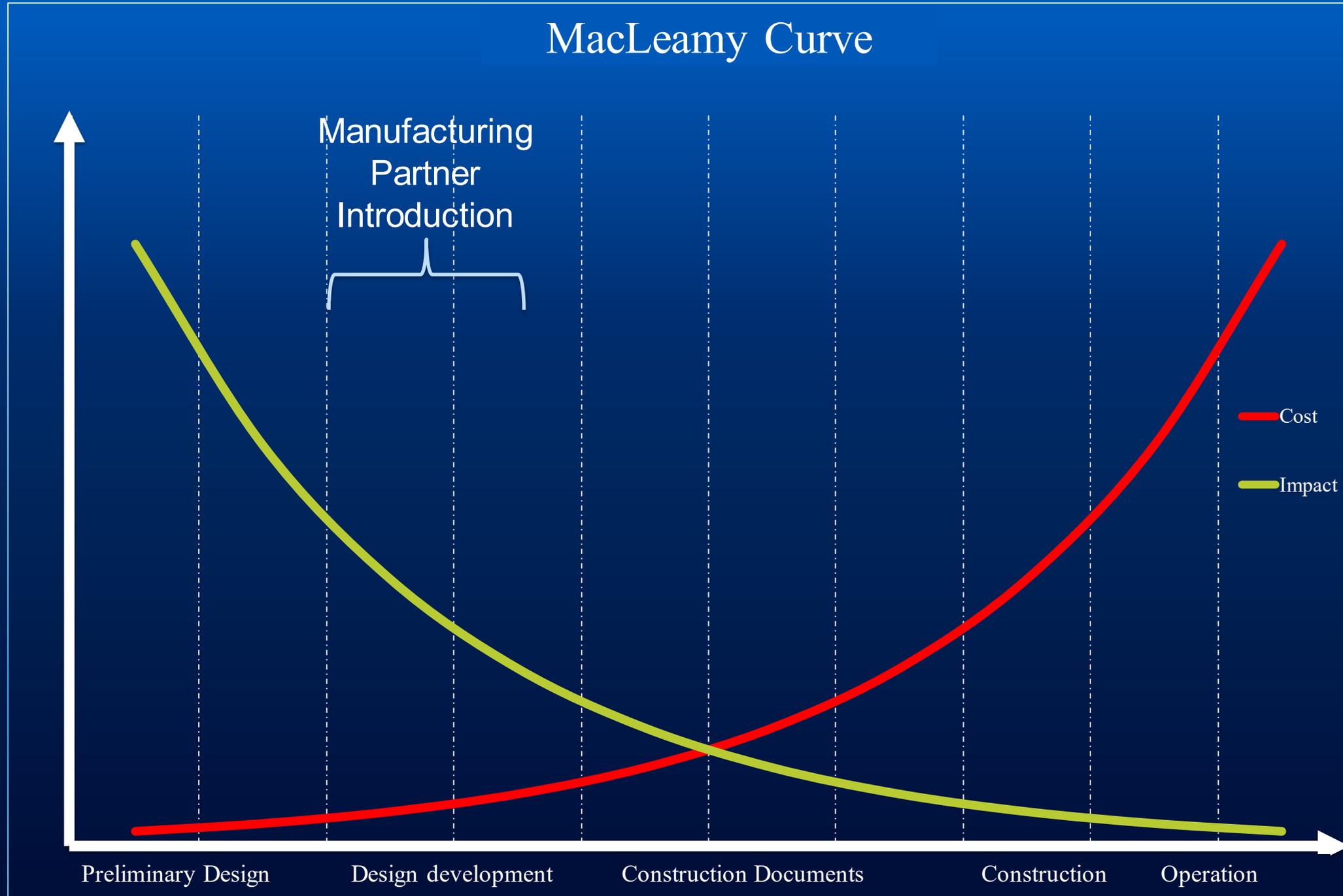
What if I asked you to make 1,000 S'mores?

Would your design change?

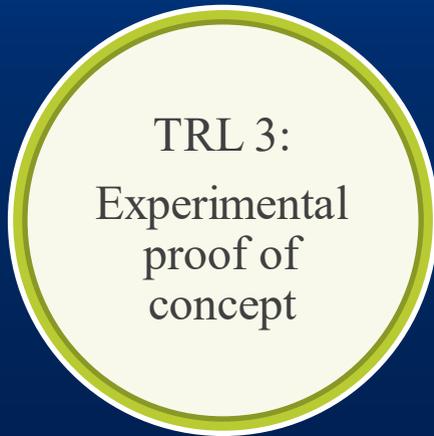
S'mores vs your Technology

1. Overview of Costs design changes
2. When, Why, and how to involve a manufacturing partner
3. Design for Manufacturing Considerations

MacLeamy Curve



When should you get a manufacturing partner?



Advisory Role



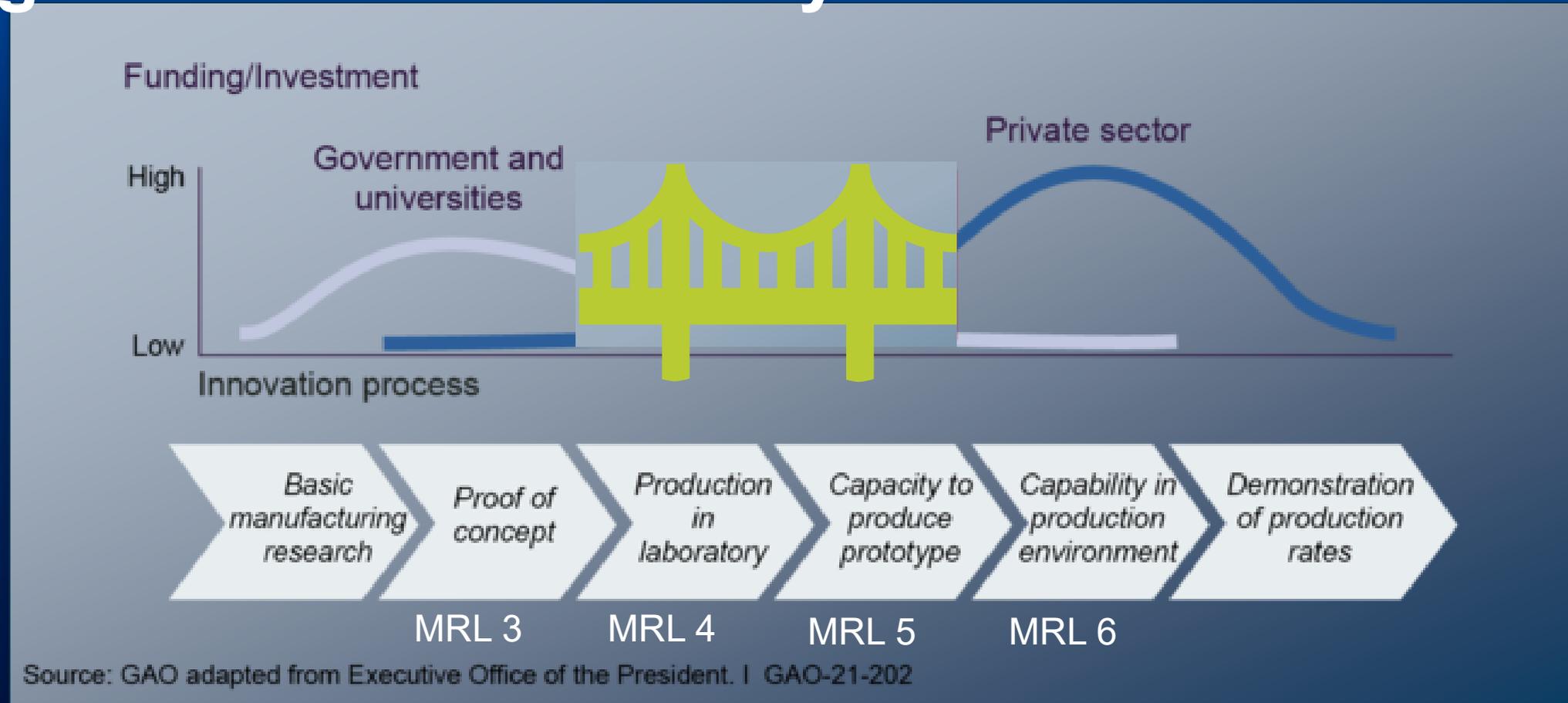
Consultant Role



Manufacturing Role

Why should you get a manufacturing partner early?

1. Bridge the Innovation Valley of Death



Why should you get a manufacturing partner early?

1. Bridge the Innovation Valley of Death
2. Design feasibility for Manufacturing
3. Established Supply Chain
4. Quality Systems in Place



<http://www.segway.cz/products/centaur/index.html>



13485:2016



9001:2015



LISTED

How to get a manufacturing partner?

1. Define your Scope and Manufacturing Needs
2. Research manufacturers within your industry
3. Negotiate terms and agreements

Design for Manufacturing Considerations

- State of the Art vs State of the Practice trade-offs
- Determine specific material requirements, not specific materials
- Make tight tolerances only when necessary
- Do not underestimate the cost of manufacturing
- Know what approvals are necessary in your industry

Back to the S'mores...



Ingredients:

1. Fudge Stripes™
2. Marshmallow



Processing:

1. Toast the Marshmallow



Assembly:

1. Sandwich the toasted marshmallow in between the cookies



Connect



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