Value Engineering in Medical Device Enclosure

Scope: Value Engineering

Application: Medical

The current medical enclosure in provide features such as cooling, ventilation to work well. But, to make them better, we want to figure out how to make them cost less without making them worse. We can do this by finding smarter ways to make them, choosing materials wisely, and using new technologies. So, by making them cheaper, we make it easier for more people to get the healthcare equipment they need.

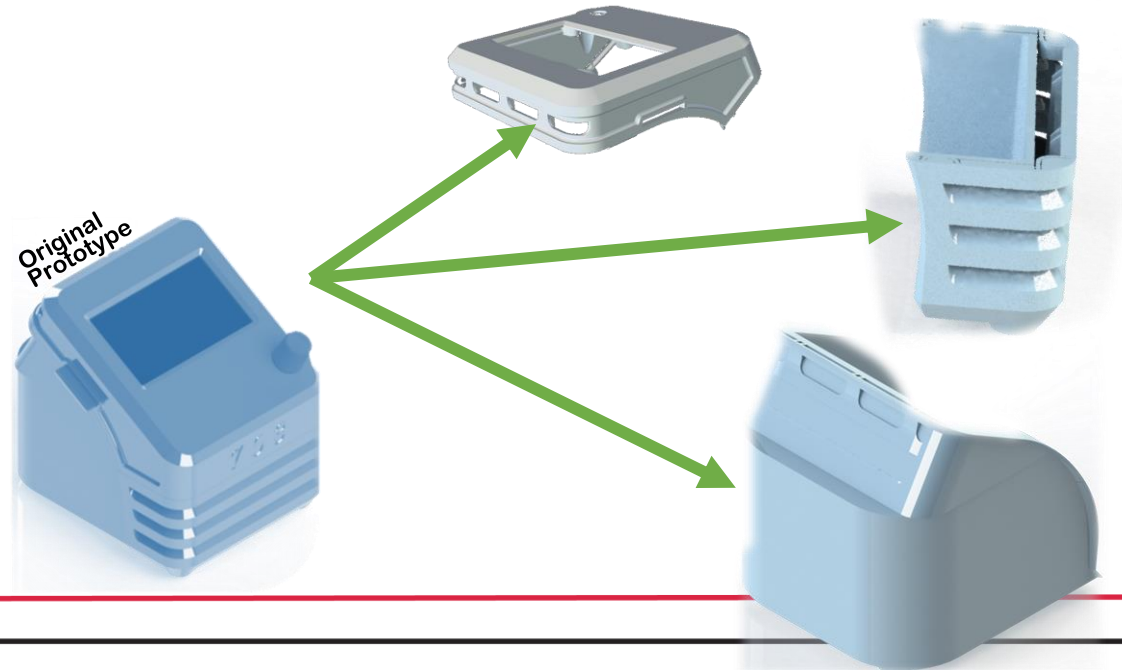
MCAD – Challenge

Challenge:

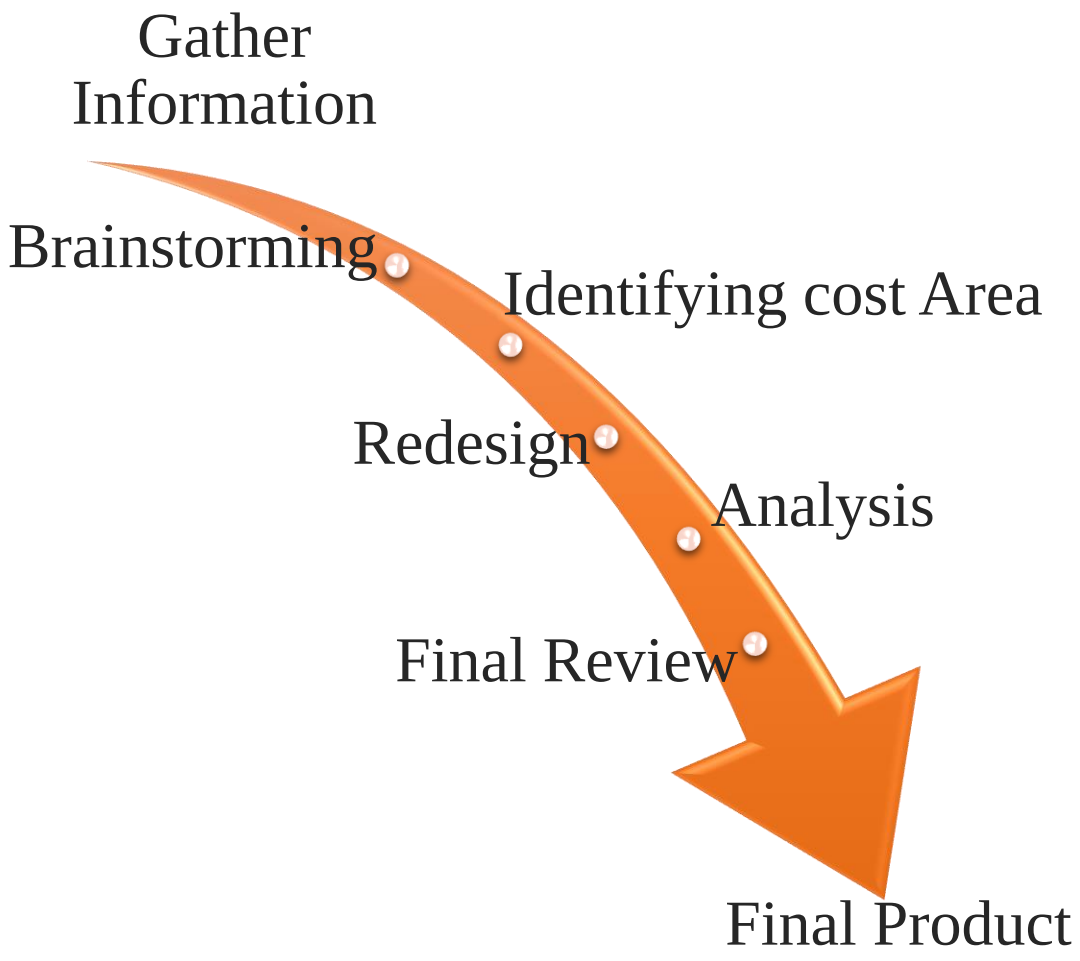
- Alternative methods for cost reduction
- Evaluating best practices versus reasonable cost to arrive at acceptable substitutions for existing manufacturing process
- Design needs to be done in short time
- Reduce material
- Increased surface finish

What's in Existing Design?

- Current design has lots of undercuts which can't be cost effectively manufactured other than 3D Printing.
- 385$ cost per unit to produce.
- 0.4 mm accuracy with DMLS 3D printing machines



MCAD – SoW


Gather Information
Brainstorming
Identifying cost Area
Redesign
Analysis
Final Review
Final Product

How We Executed?

Gather Information

- Value engineering begins by analyzing the product lifecycle which includes a forecast of all the spending and processes related to manufacturing, selling, and distributing a product.

Identing cost Area

- Through this process we find 3D printing they used is much costly and time taking process (Takes 7hrs and 385$ to produce single part).

Brainstorming

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- The Brainstorm makes the possibility to decrease the cost by following suggestions:
- Manufacturing process – changed to Injection molding
- Eliminate most undercuts
- Get rid of unnecessary features
- Use a core cavity approach
- Pay attention to DFM analysis

How We Executed?

Redesign

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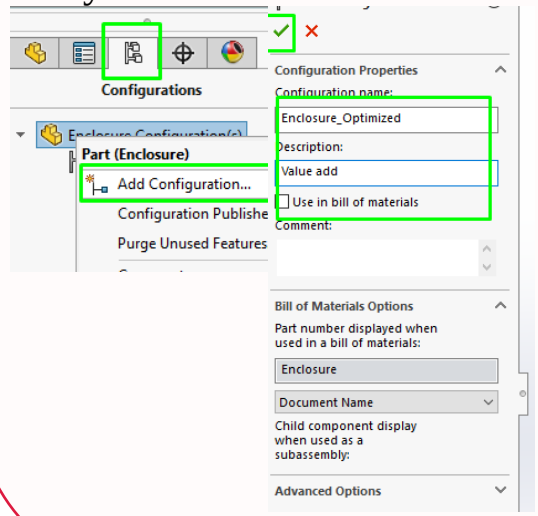
Configuration in Solidworks

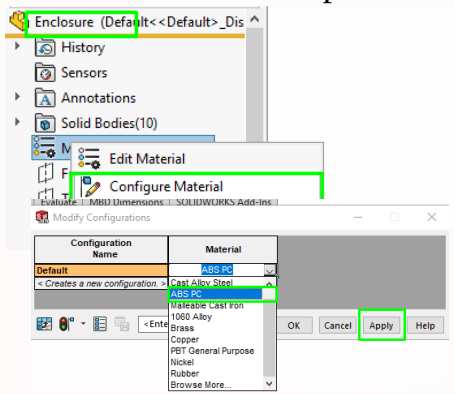
Creating configuration makes the design process easy



Adding material properties

Add same material as the Existing design in the configure material

Select **ABS PC** for plastic



Modify Design

Change some parameters to further reduce the mass

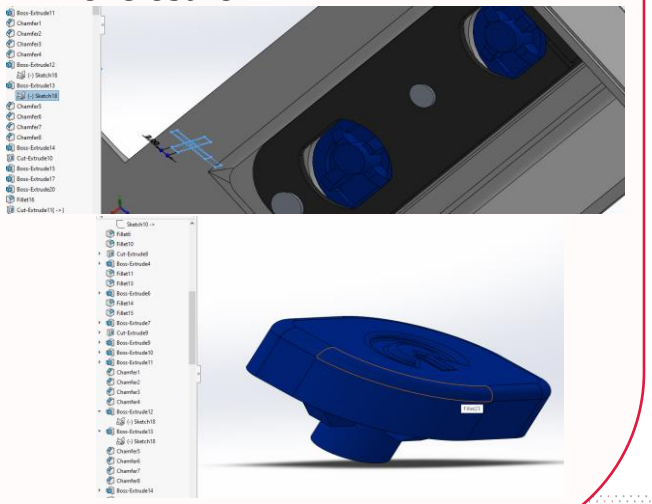
Remove unwanted undercuts

Add draft to design

Additional inputs

Add two buttons to design

Make them hold on top enclosure



How We Executed?

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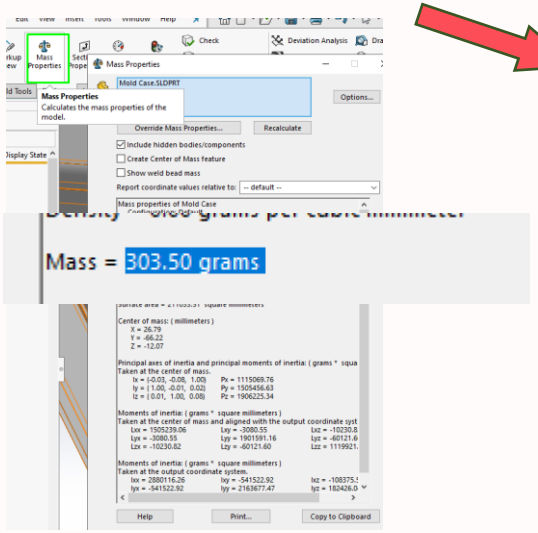
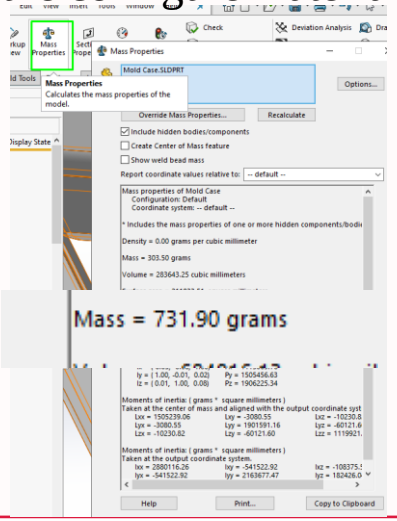
Analysis → **Final Review** → **Documentation**

Mass in Solidworks



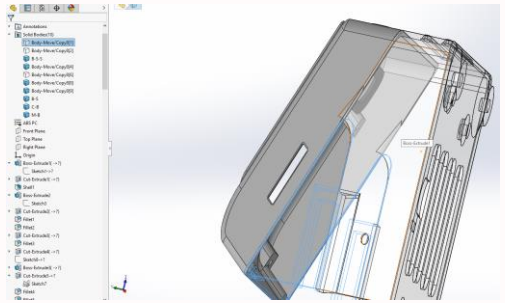
Compare with Existing

Add same material as the Existing design in the configure material

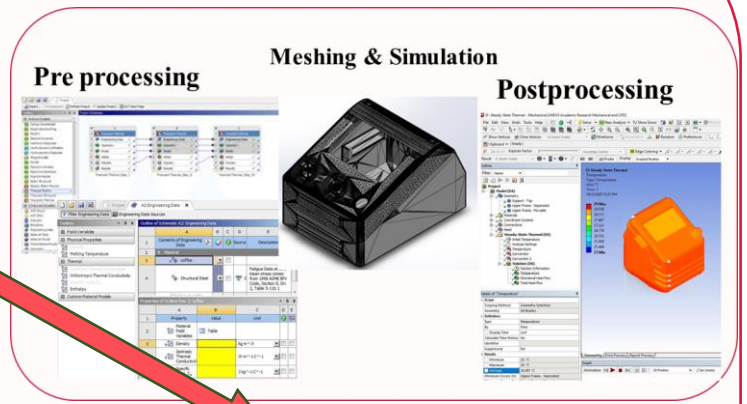


Modify Design

Change some parameters to maintain rigidity



Analysis



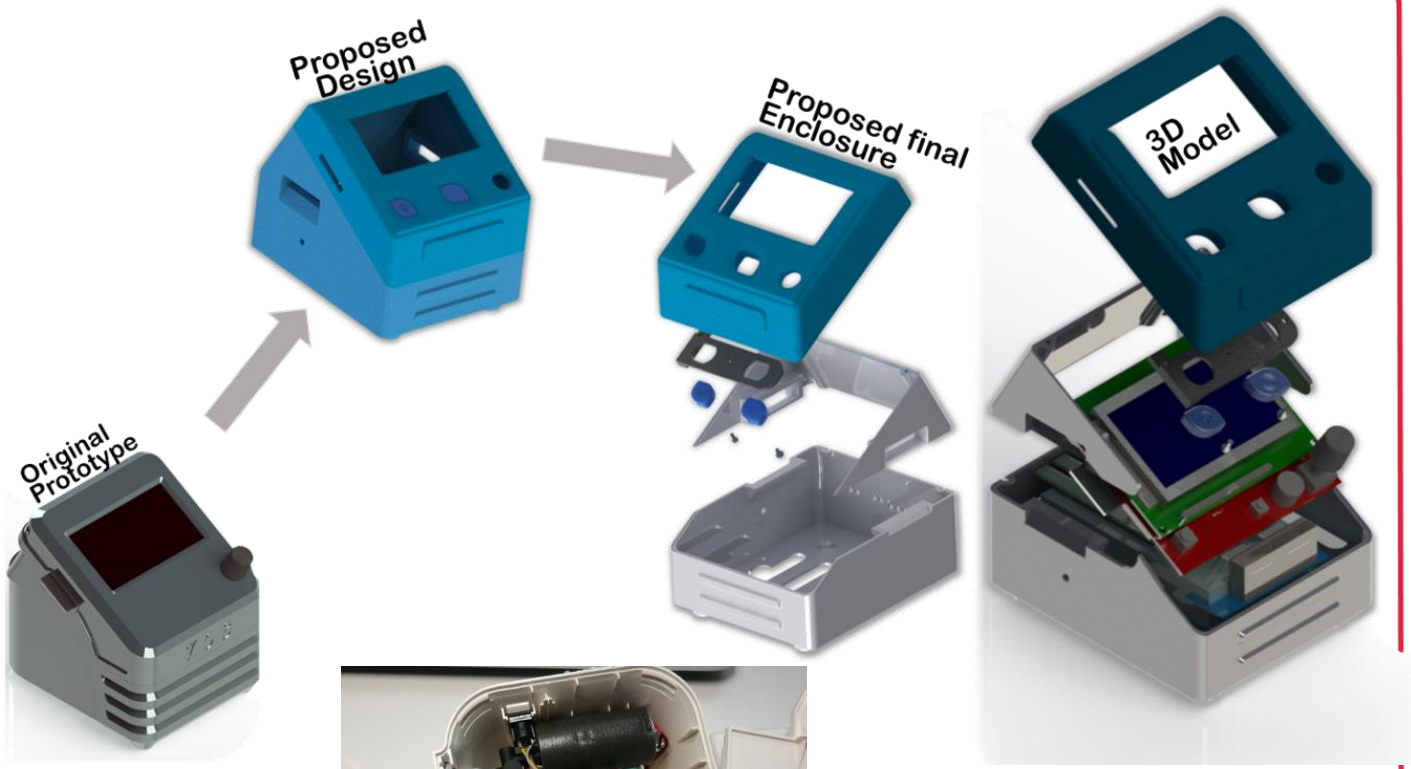
Result

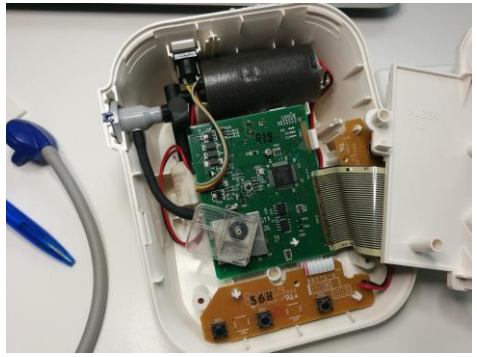
Proposed design

- After evaluating multiple manufacturing processes, we chose injection molding to simplify production, reduce complexity, good repeatability and has the accuracy of 0.07mm (comparatively greater).
- Utilizing value engineering approach, we successfully lowered the final unit cost by 52% with the decrease in production time to 8 parts per hour, achieved through a substantial mass reduction of 58% and removal of undercuts.

Value Add's

- 62% of thermal performance was increased in comparison with Existing design.





GigHz
A Global Engineering partner

An ISO-27001 ISMS Certified Company

A Heartfelt Customer's Voice

I want to give a big shoutout to GigHz for their awesome work! They helped us make our Medical Product cheaper and better in just 3 days. They changed how we make it, using a smart idea called Injection Molding instead of 3D Printing. This saved us a lot of money 52% less to make each one! They were super smart about finding ways to make it simpler and cheaper without losing quality. I totally recommend GigHz for anyone who wants great ideas to be executed in the short time with technical expertise. Thanks a bunch for making our product better and cheaper!

Conclusion

- In summary, our team successfully reduced the Medical Product prototype cost by 52% within a tight 3-day deadline.
- Shifting from 3D Printing to Injection Molding was key, and strategic changes in design contributed to the significant cost cut.
- Despite an initial investment in mold tooling, we project recovery after producing 600 pieces.
- This outcome underscores our commitment to efficient solutions without compromising quality, showcasing the company's agility and innovation in meeting tight deadlines.