



# Internship Final Review

Product design internship at Bang Design  
for FreeBowler LLC

# Contents

- Introduction
- Constraints
- Timeline
- Results
- Conclusion



# Introduction

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I was selected by Bang Design, an award winning design company based out of Bangalore, to work on a project for the start-up, FreeBowler. During the course of the internship, I have worked on improving upon the original design proposed by the start-up, focusing on improving the functionality and usability of the machine.





# Targets

- Reduce user effort
- Improve safety
- Improve user experience
- Reduce weight of the machine
- Improve foldability
- Optimize design for low volume manufacturing



# Deliverables

- Color choices and graphics
- CAD model with all the details
- 2D Drawings for manufacturing
- Liaison with prototyping and manufacturing partners



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A black and white photograph of a mechanical assembly, possibly a robotic arm or a precision instrument. The image is dark and moody, with strong highlights on the metallic surfaces. The word "Constraints" is overlaid in white text in the center of the image.

# Constraints



# Design

- Use standard steel sections available locally
- Weight limit - 25 kg
- Dimensional constraints
  - length  $\leq 1$  m
  - width  $\leq 14$  in
  - height  $\leq 12$  in
- Low volume manufacturing cost  $\leq 5000$  inr per unit

# Prototyping & Manufacturing



- Commission prototypes locally in Bangalore
- Factor in large inaccuracies in making of prototype
- Prototyping processes limited to machining and welding
- The design has to be optimized for low-volume manufacturing.
- The manufacturer has to be identified and then included in the design process to factor in his production capabilities.

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# Timeline



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A dark, high-contrast photograph of a mechanical assembly, possibly a joint or a part of a machine. The image is mostly black with some metallic highlights. The word "Results" is overlaid in white text in the center. 

# Results

# Design Iterations





# Final Release

- 2-D Drawings -  
<https://drive.google.com/open?id=1bFLClwpmUluWEfy3tTfCkJVEhYmho3nH>
- Assembly Presentation -  
[https://smailitmacin-my.sharepoint.com/:p:/g/personal/ed14b038\\_smail\\_iitm\\_ac\\_in/EaGD53F6Wj9Oji1YWI0FaQcBR2WB49mt\\_BxnU5XReF8zxw?e=scaL4J](https://smailitmacin-my.sharepoint.com/:p:/g/personal/ed14b038_smail_iitm_ac_in/EaGD53F6Wj9Oji1YWI0FaQcBR2WB49mt_BxnU5XReF8zxw?e=scaL4J)

# Future Work



- Review customer feedback from pilots, and modify the design
- Improve fold-ability and assembly for international shipping
- Provide DIY kits for international markets



Thank You!

Any questions?