

(ACADEMIC YEAR 2021-22)

Subject:- PROJECT EVALUATION

Topic:

**DESIGN , ANALYSIS AND OPTIMIZATION OF
UNIVERSAL PADDOCK STAND FOR BIKES**

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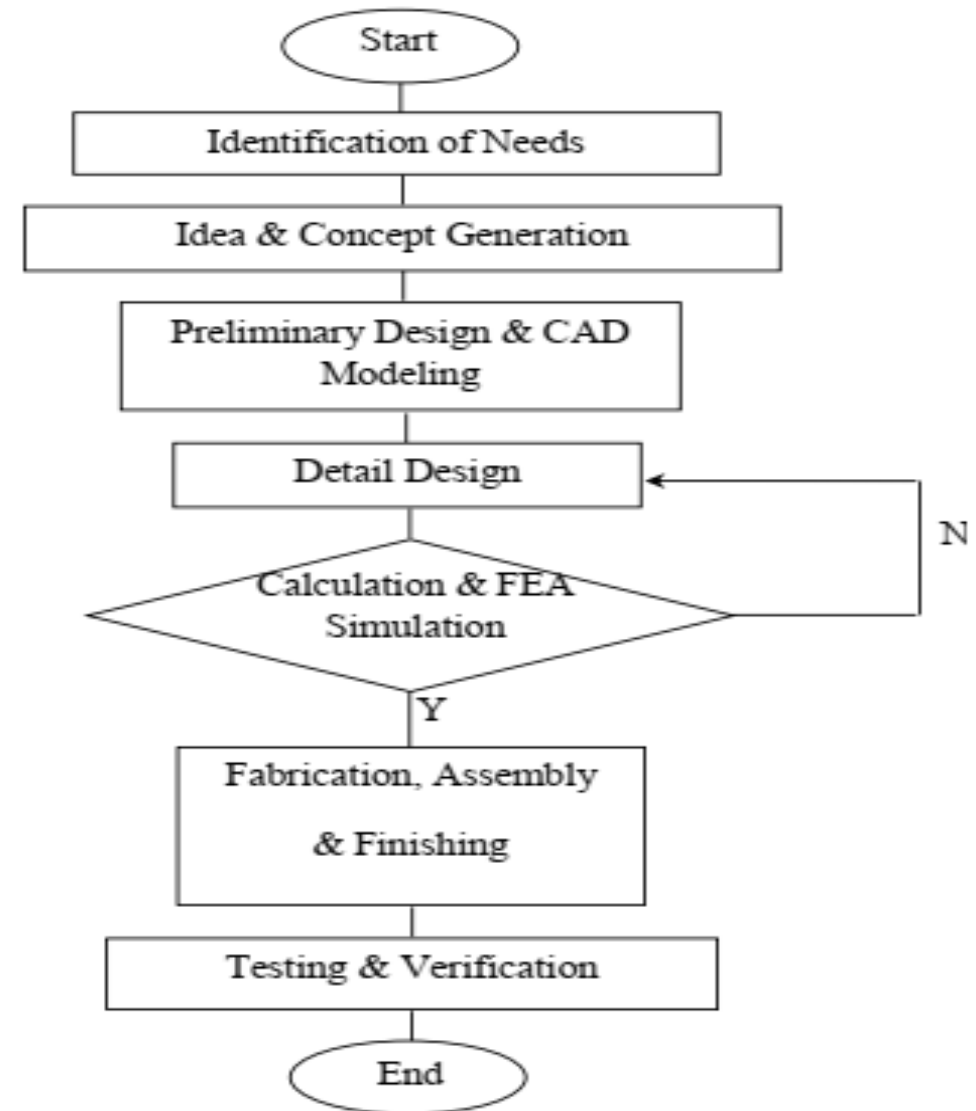
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Introduction

Bikes having dry weight of more than 100 kg, are very difficult for one person to move in a service center. They rarely come with a double-stand, such as is commonly found on much lighter lower CC motorcycles. This double-stand functions as a temporary stand that places the motorcycle in a vertical standing position, which facilitates the ease of either periodic or ad-hoc maintenance work. The side-stand provided on superbikes, places the bike in a slanting position, which gives limited access for users to do maintenance work. In addition, maintenance work on superbikes usually requires the bike to be lifted off the ground, allowing the superbike's tyres (front or rear tyre) to turn freely in a vertical position

Methodology

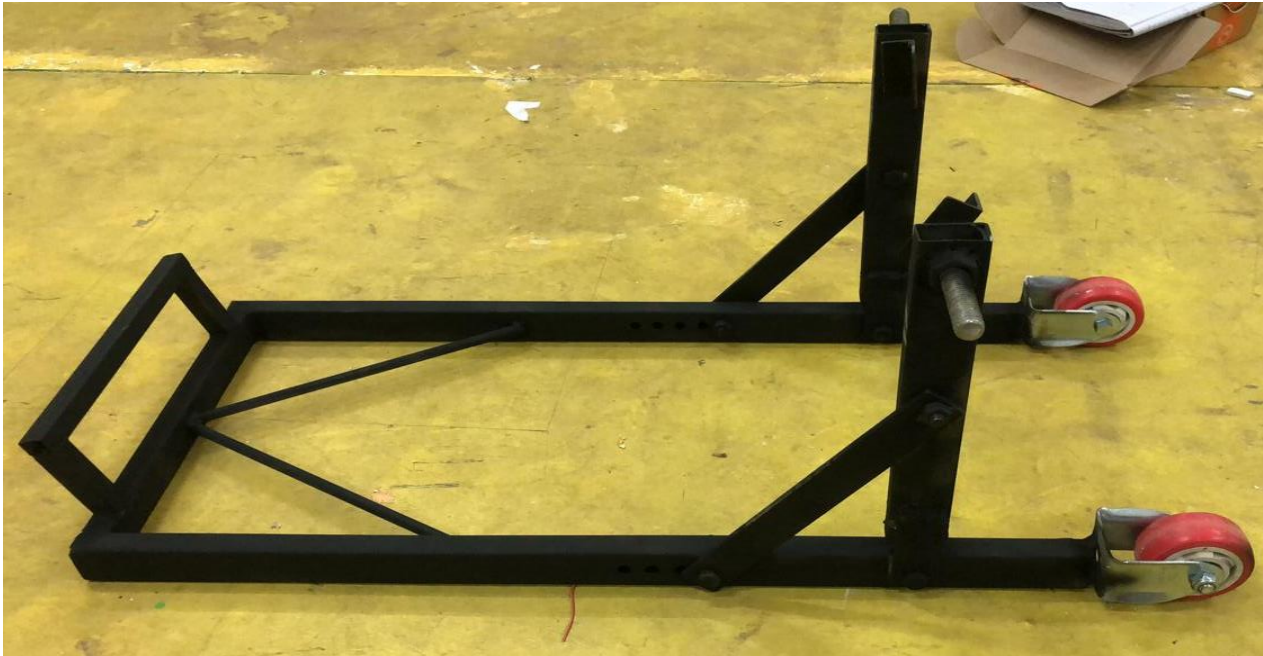
Detailed design of the superbike paddock stand was performed before it was modelled in a 3D CAD model using Solidworks software; Calculations and analysis through finite element analysis using CAE software, was then done on the 3D CAD model to analyze the maximum stresses acting on the new design. To verify that the new design will not fail with the load acting upon it, a prototype was fabricated for testing with an actual superbike.



Construction



MODEL



Result

We have successfully designed and fabricate a paddock stand within the timeframe. The paddock stand was tested by using it with actual bikes. Comparing the handling process, the proposed product is satisfied to be operated by one person only similar to the superbike hydraulic jack. Then, both of these types of paddock stand also offer safety element. The proposed paddock stand as shown in Figures is a favorable option among the available options due to the ability of the product's maneuverability.





Conclusion

This paper focused on designing a paddock stand with prioritized product features based on market research and literature review. The improved paddock stand was produced and its mobility function was validated with real superbikes and a variety of motorcycles. Therefore, it satisfied the requirements as it was practical for use by a single user with space constraints. For future product development, the sharp edges can be cut, and this will require multiple analyses such as stress analysis, deformation analysis, and transitional displacement test analysis. Besides, it is recommended to study the application of lightweight material in the development of the paddock stand.