UNIVERSITI TEKNOLOGI MARA

CAWANGAN TERENGGANU

MEC299

Structural Analysis
Simulation Of A Component
In Automotive Engineering

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ABSTRACT

The final year project involved the analysis and simulation of an automobile engineering component. The major aim of completing the project is to answer difficulties with the calculation and identification of the impacts of loads and internal forces on a structure, building, or object. This project should create a simulation to show the actual effects of various conditions and activities. The final solution should be able to meet the goal of analyzing the simulation of a specified component in automobile engineering, which is the knuckle in a Formula One car. One of the stages involved in the building of this project will be the analysis and simulation process. Throughout the process, the product will be tested until it complies with all objectives and meets project expectations. Several research processes will be done for the success of this project which involves the materials that should be used, the data collection methods that will be used, and the types of data variables that should be used. Throughout the process, the product will be tested to ensure that it satisfies all objectives and project expectations. Several research processes will be carried out to ensure the success of this project, including the materials to be utilized, the data collection methods to be employed, and the sorts of data variables to be used.

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INTRODUCTION

1.1 Introduction

This project essentially brings predictive simulation into the early stages of design. The advantages of impacting design sooner, decreasing design cycles, and eliminating much physical testing are widely established. Target project timelines from concept to prototype definition are extremely aggressive in the business, with timeframes of the order of 18 months being discussed. Given the tendency of expanding vehicle ranges to provide a diverse product portfolio, this is a remarkable feat.

Vehicle crash analysis is perhaps the most well-known simulation in automotive design, serving as a model for other disciplines in the industry. The emphasis here is now on predicting vehicle response to validate design ideas and allow change well before actual test articles are available. Most other simulation processes are being used earlier in the design loop as well. However, the limitations of current simulation technology need a classic forensic and redesign approach in some areas. Advanced research and collaboration with academic institutions are the way ahead in such circumstances.

1.1 Background of Study

This project is primarily concerned with engineering design research. The goal of engineering design research is to help the industry by providing information, methods, and tools that can increase the likelihood of delivering a successful product. This project will create a simulation, which means less testing and more product knowledge by manipulating a model describing the product with computer assistance. A model is a simplified depiction of a system (or process or theory) that is designed to improve our understanding, prediction, and possibly control of the system's behaviour.