



SNS COLLEGE OF ENGINEERING

AN AUTONOMOUS INSTITUTION



Department of Mechanical & Mechatronics Engineering (AM)

Smart Load: Real-Time Tilt & Load Optimization

Project Guide

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AP/Mechanical

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CATEGORY

Innovation Industry Vertical

**Automobile
industries**

Innovation Technology

**Robotics &
Automatiion**



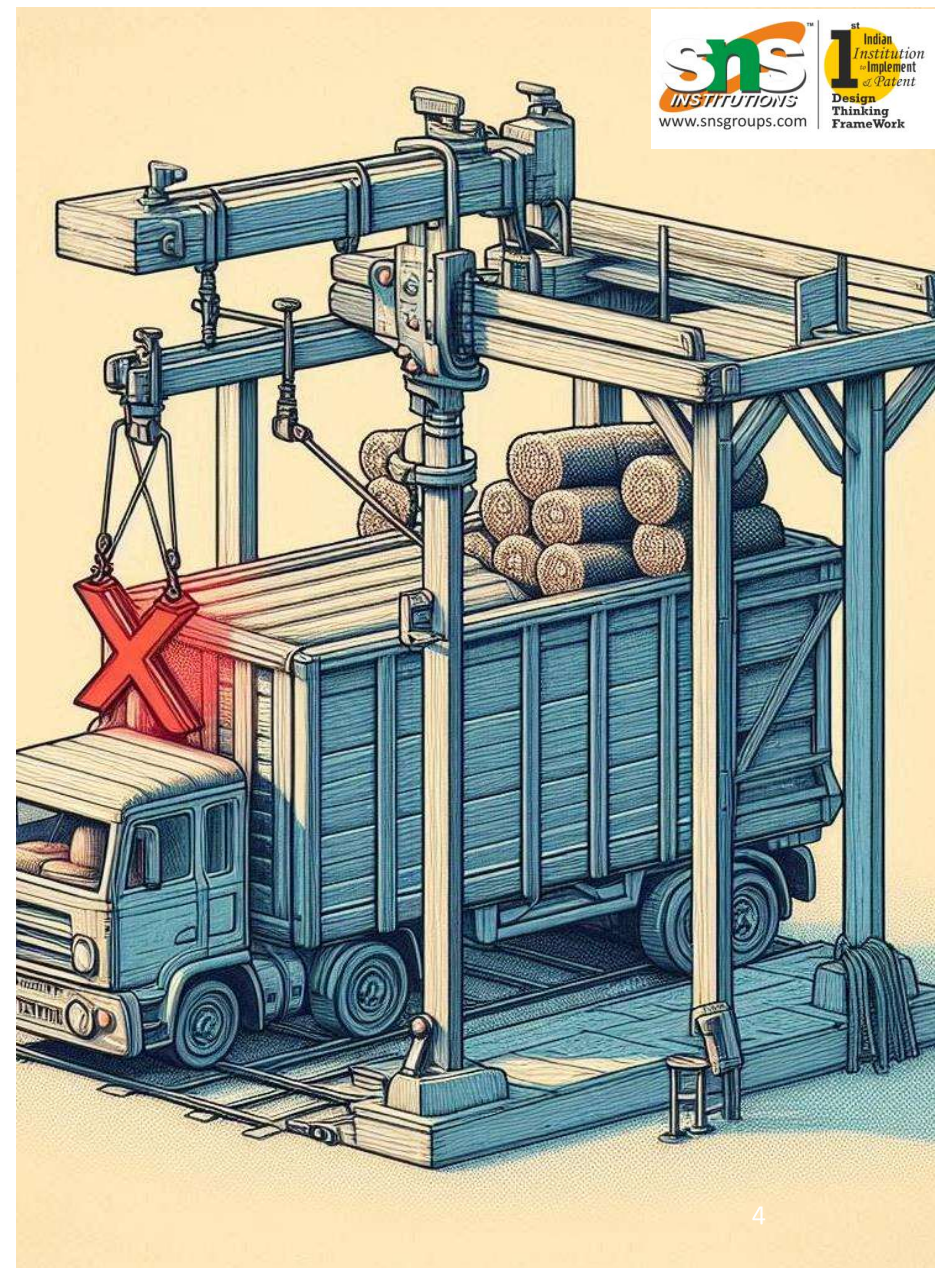
EMPATHY CHART



EMPATHY

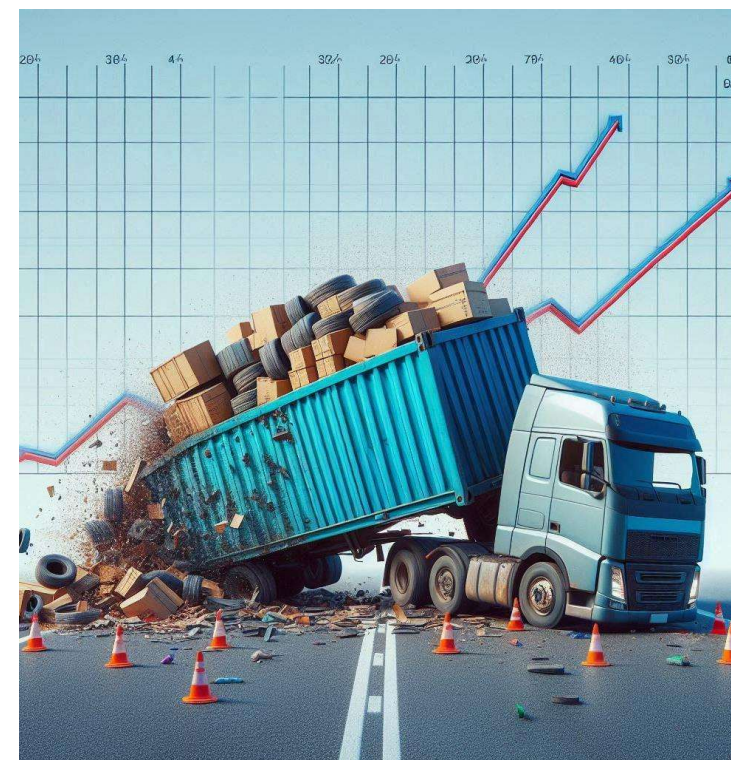
Challenges Faced by Drivers and Loading Personnel

- **Key Challenge:** Non-uniform load distribution often causes vehicle instability.
- **Real-World Impact:** Drivers experience difficulty in controlling the vehicle, especially during turns, sudden stops, or uneven road conditions.
- **Safety Concerns:** Load imbalance increases the risk of accidents, including tipping, wear and tear, and driver fatigue.



EMPATHY

- *Impact of Load Imbalance on Transport Safety*
- **Vehicle Instability:** Uneven load distribution affects the vehicle's center of gravity, leading to dangerous swerving and tipping.
- **Increased Risk of Accidents:** Imbalanced loads contribute to higher accident rates, especially in adverse weather or when the driver is fatigued.
- **Damage to Goods:** Irregularly loaded goods are more likely to be damaged during transit.



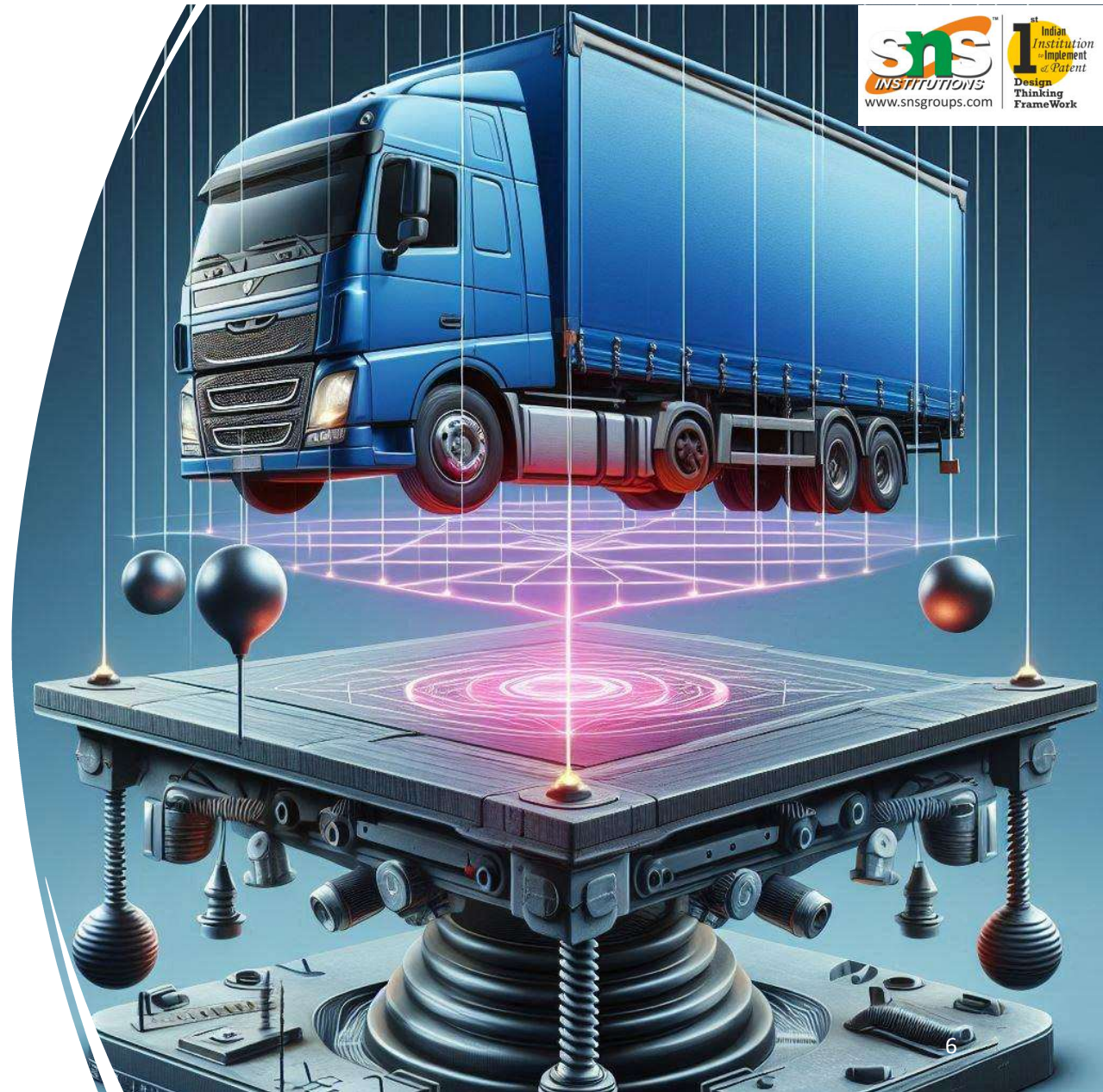


EMPATHY

Current Safety Measures and Their Limitations

- **Existing Tools:** Most drivers rely on basic manual checks or minimal load distribution tools.
- **Ineffectiveness of Current Systems:** Limited real-time feedback on load imbalance and no automation to correct it during transit.
- **Need for Improvement:** A more advanced system is required to ensure safety and optimize load distribution in real-time.

DESIGN THINKING & INNOVATION / FIRST REVIEW / II-Mech&Mct(AM)





DEFINE

- *Challenges of Uneven Load Distribution in Transport*
- **Core Issue:** Transporting non-uniform goods leads to improper load distribution, making the vehicle unstable.
- **Driver Impact:** Drivers struggle with maintaining control, especially during turns or sudden stops, due to shifting cargo.
- **Safety Risk:** Uneven load increases the likelihood of accidents, cargo damage, and vehicle wear and tear.



IDEATE

Innovative Ideas to Address Load Imbalance

- **Smart Load Balancing System:** Utilize sensors and actuators to adjust load distribution in real-time, ensuring stability during transit.
- **Automated Loading Technology:** Develop a system that automates the loading process, ensuring even and secure distribution of goods.
- **Load Monitoring System:** Continuously monitor load distribution with sensors, alerting the driver if an imbalance is detected.



IDEATE

Enhancing Safety and Efficiency Through Technology

- **Training Programs:** Establish comprehensive training for drivers and loading personnel to teach proper loading techniques and the importance of balanced distribution.
- **Automated Tilt Switch:** A device that detects and alerts the driver when the vehicle tilts beyond a safe angle due to load imbalance.
- **Collaboration with Industry Partners:** Partner with vehicle manufacturers to integrate these technologies into new models for enhanced safety and efficiency.



WORK CHART

Work Description		
	01.12.2023	16.12.2023
	-	-
	15.12.2023	31.12.2023
Zeroth Review	4.12.2023	-
Empathy & Define	-	17.12.2023
Ideate	-	18.12.2023
First Review	-	19.12.2023
Prototype	-	-
Second Review	-	-
Test		-
Third Review		-
Report & PPT		



Thank You