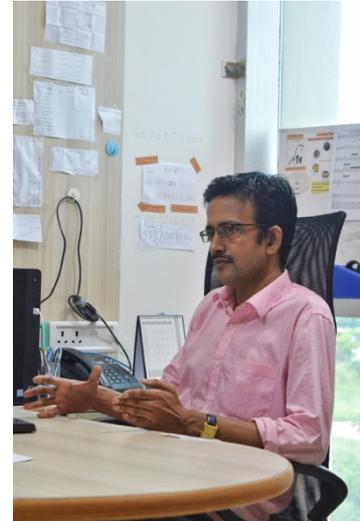


## **IoT Enabled Hydraulic Controlled Multi-Directional Lifting & Dropping Dumper: The First Patent Filed in IIITDM History**

Chennai

Dr. Shahul Hamid Khan, Faculty of Mechanical Engineering at IIITDM Kancheepuram, having done his PhD at NIT Trichy and specializing in Manufacturing Systems as well as Logistics and Supply Chain Management, has conceptually developed an "IoT Enabled Hydraulic Controlled Multi-Directional Lifting & Dropping Dumper" which is the first patent filed at IIITDM Kancheepuram.

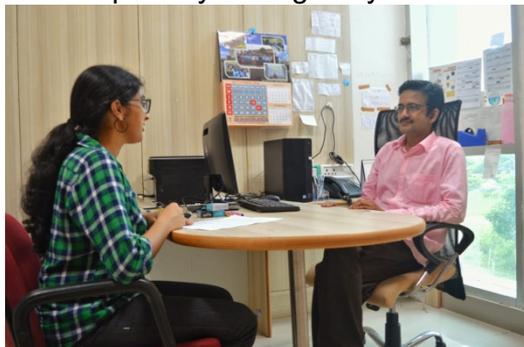
Dumpers are the most common cause of accidents in plants and construction sites. A typical dump truck is equipped with a pneumatically operated open box dead hinged at the rear. The front of which can be lifted up to allow the contents to be deposited on the ground behind the truck. Nowadays, dumpers with swivel skips can be rotated sideways which is a 3 directional mechanism. But this technology is still insufficient. It is highly inconvenient for vehicles to re-position according to the dumping side in narrow lanes. These models require more space, time and fuel. This difficulty can be overcome by multiple sides dumping mechanism using a single actuator having spherical joints at its end.



Having noticed this industrial issue and also realizing that IoT would greatly improve the efficiency and ease of working of the model, Dr. Shahul conceptualized this product.

The objective of the invention is to fabricate an IoT enabled hydraulic operated multi-directional lifting and dropping dumper which will load and unload the materials in multiple directions, in any constricted or narrow work site. The invention can be entirely controlled through a specially designed mobile app, which can enable the operator to regulate its lifting, lowering, direction of rotation and determining the dumping height, even from distant places. This will drastically reduce the efforts required for unloading the loose material in one side tipper trucks.

It uses a hydraulic jack mechanism which is a powerful lifting tool designed to provide effective lift over greater distance than the basic mechanical jack. Hydraulic jacks use a plunger mechanism and a non-compressible fluid, typically a hydraulic oil, to create the required pressure and thus result in greater lifting capability. A fluid reservoir supplies the hydraulic fluid in required pressurized levels which enables the hydraulic unit to lift and lower the dumper tray. This greatly reduces time and fuel consumption.



The direction of rotation of the dumper tray is determined by the rotation of a hub motor. This motor receives its power from a high storage capacity rechargeable battery and is stored in a separate metal casing just above this battery.

The entire device can be managed remotely using cloud technology and a specially designed mobile app. The exact position of the vehicle can be tracked with the help of sensors. An antenna

receives the signals sent from the mobile app, which will regulate and control the lifting, lowering, direction of rotation and fixing the correct angle of the dumper tray.

This patent signifies the start of a new culture which emboldens our institute's moto of design, innovation and manufacturing. It is one of the first bricks to be laid and so we encourage students and faculty alike and hope to see many more innovations to come.

*by Kruttika Bhat*