# Charcha Manch Series



### 8<sup>th</sup> Panel Discussion with Experts From ALTAIR

(A global leader in Computer Aided Engineering Solutions to sector like Automotive, Aerospace, and Consumer Durables)



#### **Online Panel Discussion with Industry Expert**



#### **Electrical Vehicle Technology - Trends and Career Opportunities**

Patron

**Prof. O R S Rao, Vice-Chancellor** 

Sri Pradeep Kumar Head Channel Sales Sri Madeshwar S K Technical Manager

Sri Manoj Menghrajani BDM, Electromagnetic Solution Sri Pandu Ranga Rao VP- Technical Operation



## **KEY DISCUSSION POINTS**

- Altair Engineering is a Computer Aided Engg Solutions provider to Industries like Aeropspace, Automotive, Consumer Durables etc
- Altair solutions cover concept development, development partner, weight management, optimization center, design and validation and chassis development.
- Briefly discusses about various Challenges of EVs in India and challenges for EVs development phases (or R&D challenges).
- EVs push our existing society towards zero emission society through EVs home charging, zero emission urban areas, zero emission road lanes, park & ride and smart community.
- Modern technique such as 3D printing & simulation of product & processes makes revolution in both 2 and 4 wheeler market.
- Automatic light weighting strategies like material light weighting, shape light weighting, production light weighting, concept light weighting and integrated light weighting

**University Ambassador Program** 

 Altair organizes formula SAE, baja SAE etc. to gain experience in project handling, team work .

In 'University Ambassador Program', Altair selected top students from department and put them in a coordinating role between Altair and University.

 Helps in recruiting & tie up with their collaborators or industries.



#### 🛆 Altair 🛛 University











#### **Global Overview of EVs Market**

- Deliver glimpse of global overview of EVs market, how EVs are came into picture in last decades,
- EVs were started a century back in 1902 but not became popular due to low fuel prices and huge charging time of batteries.
- Texla is the game charger now in automotive sector.
   By 2022 EVs will cost the same as IC engines because of huge R&D throughout the world Nowadays,
- Most of the popular companies shifting towards production of new Evs or retrofit EVs





Sri Pandu Ranga Rao V. P. Altair India

#### **Modern Technique Such as 3D Printing**

- In future (till 2030), EVs will requires Electrification, Network connectivity, Autonomous vehicles and Diverse mobility.
- People's mindset changes continuously with time, nowadays, safety and environmental concerns are more important. They want to travel in their own vehicle or car due to COVID 19.
- Challenges of EVs are range anxiety, vehicle integration, safety and performance

Modern technique such as 3D printing makes revolution in both 2 and 4 wheeler market. Using this, it is possible to manufacture a EV bike having 35 Kg weight and 80 Km/hr mileage.



#### **Challenges for EVs in India**



FEKC

One Proo Multiple

Sri Manoj Menghrajani



Various Challenges for EVs in India:

Market Constraints
 Technological Constraints
 Infrastructure Constraints
 Policy making Constraints

#### **Challenges for EVs in India**





#### **Key Challenges in EVs Development**



R & D challenges of EVs are range anxiety, miles per charge, safety and durability and performance engineering.



#### **Altair Role of R&D in EVs**



- Concept Development: Designers working directly alongside engineers, consumer design research, ideation leadership, styling and physical prototyping
- Development partner: Established OEM-level processes, supplier development, CAD, Design & release.
- Weight Management: Re-thinking the traditional late in cycle approach to mass management attributes mass management and component optimization.
- Optimization Center: In-house centers focused on weight reduction, optimized motors and antennas.
- Design & validation: Development process with risk and shorter cycle time, safety and thermal analysis.
- Chassis Development: Program proven development methodology, subjective evaluation, simulation from Kinematics & parameter models to fles-bodies.

#### **Altair Role of R&D in EVs**





Altair steps in at conceptualization stage of the new EVs and stays till the production stage.

Hypermesh solvers could be used to durability, noise, vibration and harshness, crash and impact, battery and thermal management, ride and handling as well as light handling.

#### **Challenges for e-Mobility**



Challenges of e- Mobility like light weighting, noise and vibration, crash and safety, ride handling/durability, energy efficiency and simulation driven design.

New key systems:
Traction motor,
Battery,
Power electronics-inverter
System modeling and control

**Challenges:** 

Packaging and weight distribution
 New requirement of materials
 Complex system



#### **Zero Emission Society**



## **Towards a Zero Emission Society**



EV Home Charging (easy and cheap energy)

EV Quick Charging (convenient and fast) Zero Emissions Urban Areas (remove noise & air pollution)

- EVs pushes our existing society towards zero emission society through EVs home charging, zero emission urban areas, zero emission road lanes, park & ride and smart community.
- ✓ Altair's strategic focus towards mobile ecosystem, convergence of technology, global evaluation towards electric smart and connected vehicle

#### **Simulation And Design**

Discussed related to the topic of simulation and design, vehicle range of light weighting in Electric Vehicle.

Evolution of simulation containing product validation and product design (From 1980s to 2020s)Different changes of E- Mobility

- Packaging and weight distributions
- Complex Design
- Noise and vibration
- Ride Handling / Durability
- Crash and safety
- Energy efficiency





Sri Madeshwar S K

#### **ALTAIR Solves Technology for Automotive.**

#### **Solutions for Simulation-Driven Design**





Discussed about the different ALTAIR Solves Technology for Automotive.
 Simulation by using Multi physics (consisted and holistic setup of Multi physics Problem)

#### **Automotive Lightweight Strategies**



**Development Timeline** 



Light weight component materials are main strategies to improve the range of Electric Vehicle. There are different strategies:

- ✓ Material Light weighting and Shape Light weighting (Load optimized shape)
- Production Light weighting (New and special production and joining technology)
- Concept Light weighting (Changes in load carrying strategies)
- ✓ Integrated Light weighting (Technology in an integrated development process)



#### ICFAI UNIVERSITY JHARKHAND

## EVs provide multidisciplinary opportunities

**Electrification** 

Artificial Intelligence

**Machine Learning** 

**Internet Of Things** 

**Block Chain Technology** 

Data Science.

#### **Optimization Techniques During Simulation**





 Discussed various optimization Techniques during simulation alon with cooling of electronics components, thermal management for external aerodynamics based modern styling

#### **Industry Outreach Programs & Student Projects**





4 Wheeler Vehicle Project FEM of Sheet Metal Casting Simulation e-books

- Students projects includes motion analysis of 2 and 4 wheeled vehicles, additive manufacturing simulation, finite element modeling, casting simulation, CFD and sheet metal forming simulation
- Altair academic program provides e-books for faculty, 'University Ambassador Program', and industry outreach Programs



□ B Tech students will get opportunity to work in areas such as CAE software, consulting services, computing, and business analytics.

Computer Science students : Data Scientists & Analysts,
 Designers, Developers, Engineers, Executives, Facility Managers, IT &
 HPC Professionals, and Start-ups.

Management Students: Business development, marketing, resource management, logistic, finance management, engineering, and product devolvement. **Career opportunities for BTech /DIT students** 



Mechanical Students will get career opportunities in :

Consulting jobs in the field of product development, product design, validation & testing.

Tool design and development, manufacturing of jigs, fixture & dies, etc.

Technical maintenance, quality, field services, and documentation for engineering

# Thank You



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