

#startupindia



# Nhanz Systems Pvt Ltd

Battery to wheels

Registered Name of Company	: Nhanz Systems Private Limited
Date of Incorporation	: 22/08/2017
Founders	: Riaz Ahamed NA (riaz@nhanz.in) Nema Fathima(nema@nhanz.in)
Address	: SM89,Industrial Estate, Bommasandra, Bengaluru-560099
Website	: www.nhanz.in

## **Vision:**

To become the best solution provider for electric vehicle systems in India and South East Asian markets

## **Mission:**

To cater the electric vehicle industry with efficient and cost effective Drivetrain solutions across all vehicle segments spanning from 2 wheelers to E-bus

# The team



*Solving OEM concerns from one tier down*



**Riaz Ahmed**

**CEO & Managing Director**

*Packs 23 years experience innovating in machine tools, ICE engine and Electric vehicle drivetrain  
Runs Nhanz from end to end and still eagerly finds time to sit with engineers for design and actively involves whenever team is stuck*



**Abhijith V P**

**Chief Technology Officer**

*9 years of experience in electric drivetrain simulation, power electronics and controls design and testing. Leads the design planning, execution and problem solving.*



**Dr. Shamsuddeen Nalakath**

**Technical Advisor**

*With 12+ years of experience with motors and a Doctorate from same domain, supports Nhanz for topology optimization of motors and control techniques*

**..And around 40 young, agile engineers actively designing, testing and deploying systems to help our collective vision!**

## Mass adoption of EVs in India and South-East Asia are driven by livelihood vehicles!

We understood livelihood vehicle owners need

- low upfront cost for the vehicle
- very low running costs for faster break-even

And..how we address them?

- optimal drivetrain design and value added services to optimize the solution for OEMs. In addition, our high drive cycle efficient drivetrain means you pack a smaller battery!
- focus on high system reliability and localized / low sourcing risk child parts

Zero maintenance cost, systems are designed with high reliability proven by testing

## What makes Nhanz e-motors the perfect solution



Rare earth free IPM design for lower cost and sourcing risk



5% to 40% cost reduction from benchmark IPMs

Mass production friendly design with hairpin winding



Achieve high production volumes

More than thousand hours of iterations in virtual validation



Design meets optimal torque density/ripple and drive-cycle efficiency

High speed operation



Power density meeting similar rare-earth geometry

Design is scalable across wide power range



Tooling cost amortized across platforms





## And what about our power electronics?

High performance thermal system design



'No-cutback' operation for vehicle

'One-assembly-suits-all' design philosophy



Achieve high production volumes

Virtual validation focussing on thermal, EMC and functional operation



Except initial platform, all designs met EMC, thermal and functional targets first time right

Uses generic footprints for all components

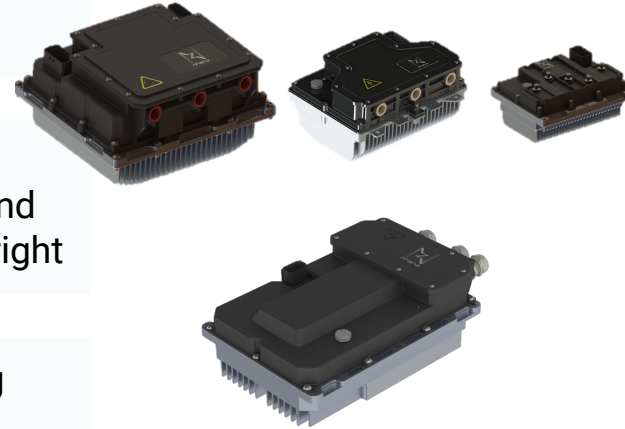


Lower cost and low sourcing risk

One casing is scalable across wide power range



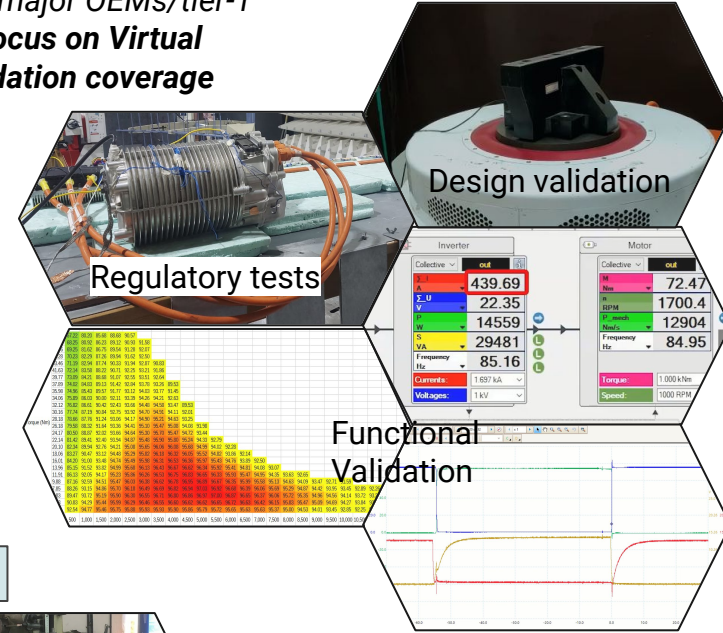
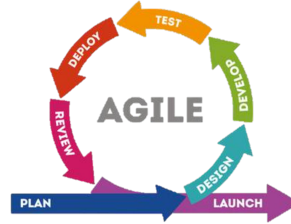
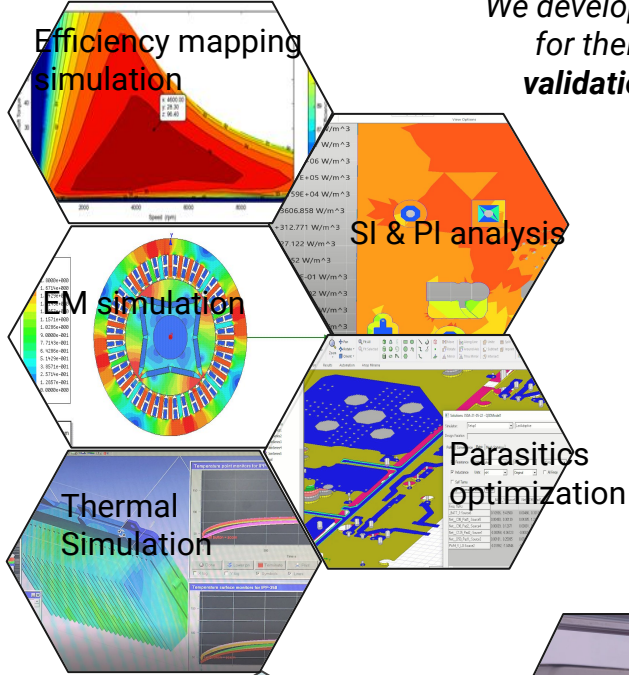
Tooling cost amortized across platforms



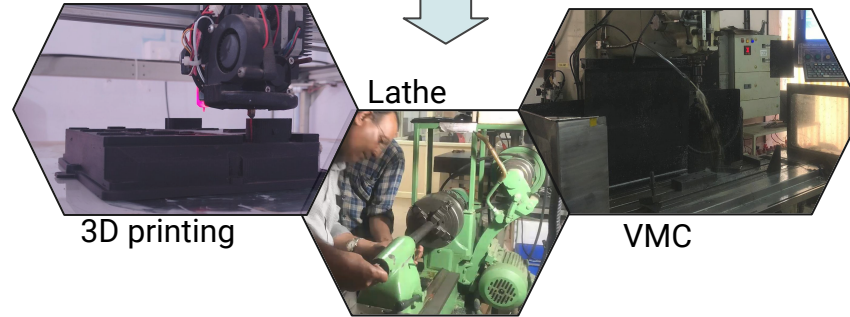
*And there is the optimal control algorithm keeping in mind end-vehicle application!*

# How we design our offerings?

We develop in-house products and also support major OEMs/tier-1 for their internal developments with **strong focus on Virtual validation, fast in house prototyping and validation coverage**



## In house prototyping



Iterative Design for optimal solution

Functional and Product validation

# Product Strategy - Automotive



Intended  
Vehicle  
platforms  
→



Peak power  
Range  
→



Voltage  
Range  
→

Nhanz  
Drivetrain  
Solution  
→



In proto stage

Functional proveout done. Validation and production toolup in progress!

In concept proto stage

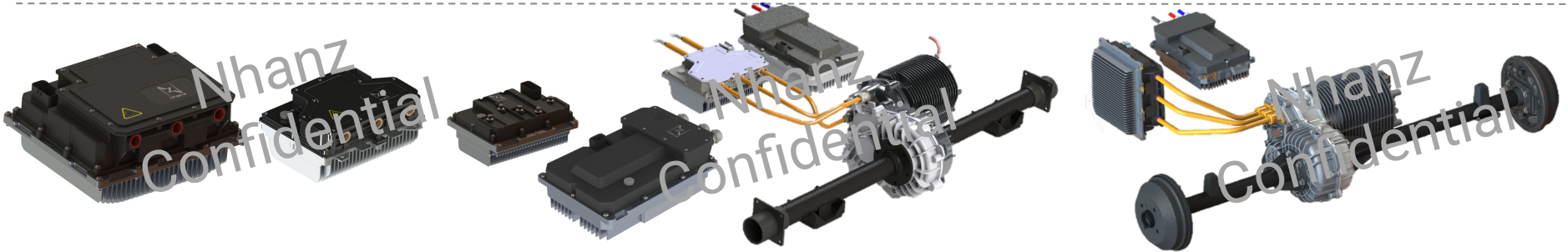


# Product Strategy - Other Industries

## Commercial Segment



## Personal Segment



All low voltage drivetrains will replace various existing imported solutions in construction, farming, generic & airport material handling. These solutions can also cater to certain personal segments not limited to medical mobility, golf carts, intra-SEZ, township transportation, all-terrain transports.

# EDT option : 3 wheeler and NEVs

- Made for Cost sensitive market
- GVW < 1200 kg
- Rare earth free IPM motor with high efficiency
- Integral gear box construction
- Air cooled EPT with 2 minute peak rating after 35 minutes continuous operation
- Power 8kW - 15kW peak
- Axle torque <800Nm
- Transaxle with CVJ or driven axle configuration
- >20-30% gradeability capability with >50kmph max speed



SI No	Component	Details	Type
1	Motor	8kW - 15kW/ 30Nm - 50Nm	Air cooled, IPM
2	Gearbox	Ratio 15.4/12.5/11/9	Integrated
3	MCU	48V/72V/96V - 400A/350A	Air cooled

# EDT option : 2 wheeler

- Cost competitive and low sourcing risk
- Ideal for GVW < 300 kg scooters
- Rare earth free IPM motor with high efficiency
- Integral gear box construction - single stage
- Air cooled EPT with 2 minute peak rating after 35 minutes continuous operation
- Power 4kW - 8kW peak
- Axle torque <200Nm
- Integrated rear brake
- Provision for suspension mounting
- >20% gradeability with >80kmph top speed
- Same components re-used for mid-mount motorcycle solution



SI No	Component	Details	Type
1	Motor	4kW - 8kW/ 25Nm - 40Nm	Air cooled,IPM
2	Gearbox	Ratio 5.2	Integrated
3	MCU	48V/72V - 300A/200A	Air cooled

# Drivetrain Solutions: 4W and Small Commercial Vehicles



- First of a kind **60kW Air cooled IP67** inverter for **350V** systems
- Design protected for **IGBT or SiC** options from multiple manufacturers for sourcing risk reduction and scalable performance
- Except microcontroller, all parts have **alternate make, drop in replacements**
- Hardware design with **ASIL C capability**
- Designed to withstand **ISO 16750, ISO 19453, ISO 7637-4** test standards & Pre regulation inline to **ECE R10 and ECE R85**
- **Support vehicle control functions**

1. Power up power down
2. Drive control (Propulsion control)
3. EPT thermal management
4. Charging coordination
5. ABS/ESC/TCS integration



SI No	Component	Details	Type
1	Motor	35kW - 60kW/ 80Nm - 130Nm	Air cooled,IPM
2	Gearbox	Ratio 8.5-15.6	Integrated
3	MCU	72V/96V/ 450A 320V/220A	Air cooled



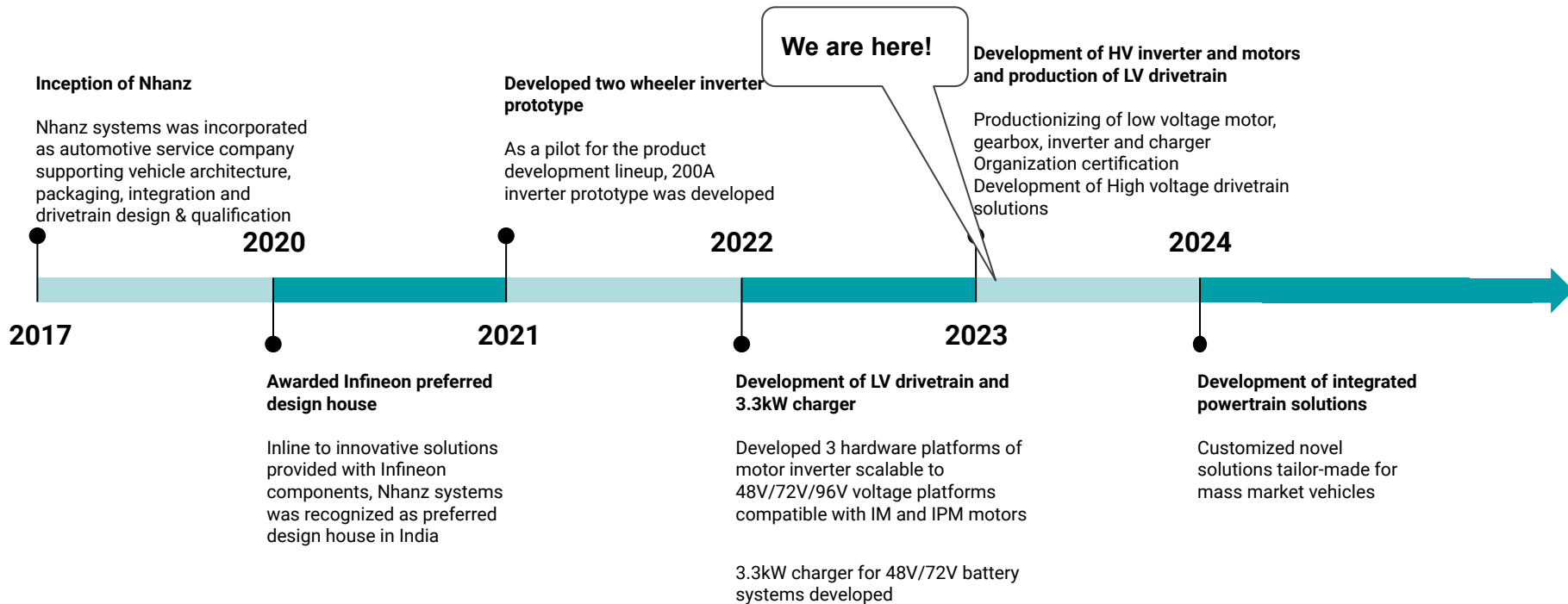
# EDT option : eBus and Trucks

- <40% lower cost than available solution in market
- Ideal for GVW 9T and 16T applications
- Rare earth free IPM motor with high efficiency
- Integral gear box construction - single stage
- Axle torque <3500Nm
- Motor, Motor Controller and Gearbox integrated
- Suitable for retrofitting
- EGW cooled power electronics and oil cooled rotating parts for high power density



SI No	Component	Details	Type
1	Motor	160kW - 230kW/ 500Nm - 720Nm	Air cooled, IPM
2	Gearbox	Ratio 3-5.2	Integrated
3	MCU	400V/650V - 400A	Liquid cooled

# Milestones



## What brings us here

**We are looking at \$125 million revenue by the end of FY2027 and reaching there need a small push..**

**We are looking for investing partners for our next steps as below**

- Additional customer base development
- Pilot Production and ramp-up
- Team ramp up to support production, customer engagement and technical support
- Future product development with added focus on electrical integration specific to the platforms

**Please get in touch with us if you are as excited as we are in this!**

THANK YOU