e-Bus Fleet, Battery & Charging Infra
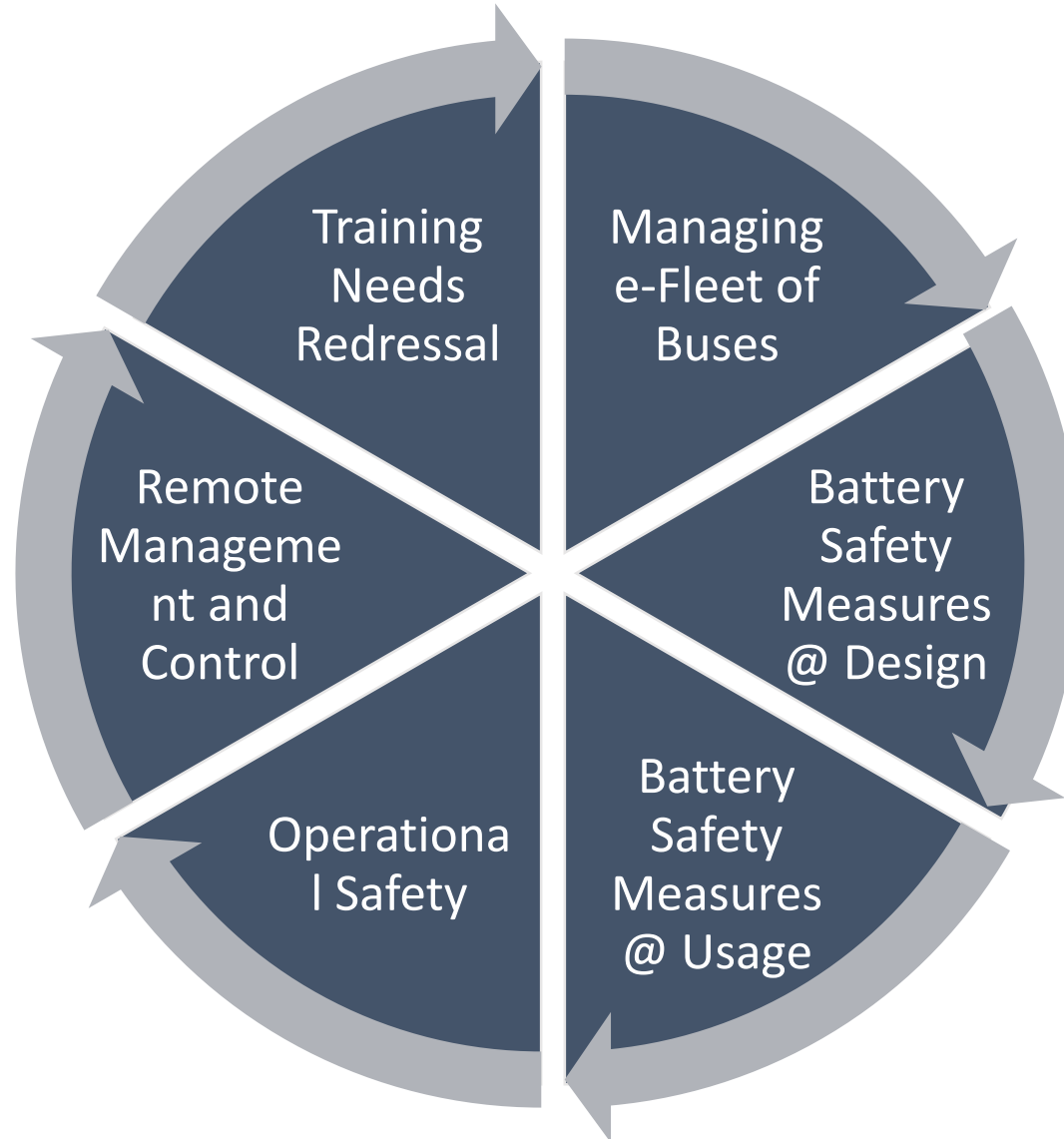

Planning, Management & Optimization
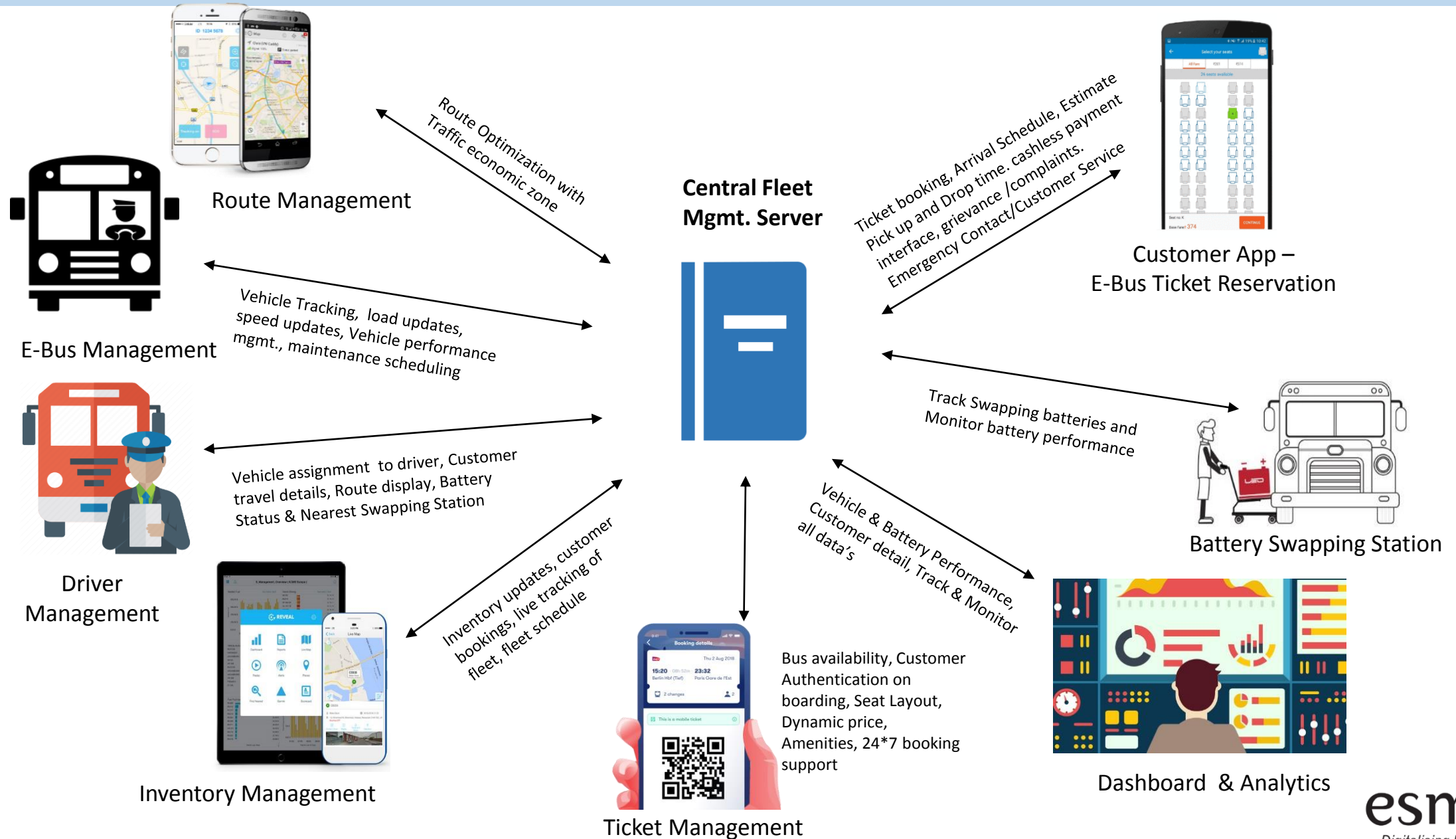
Prabhjot Kaur, PhD
Co-Founder and CEO

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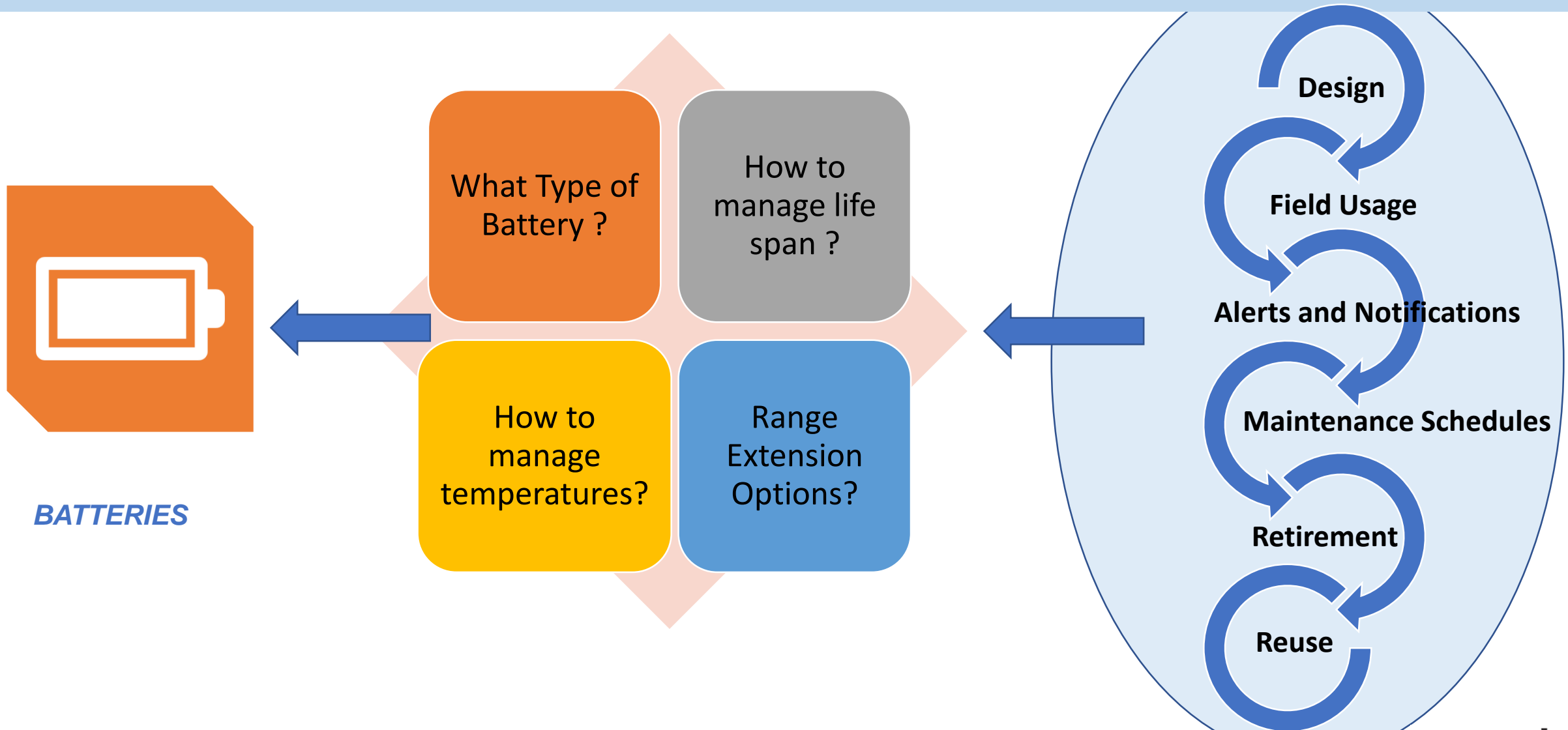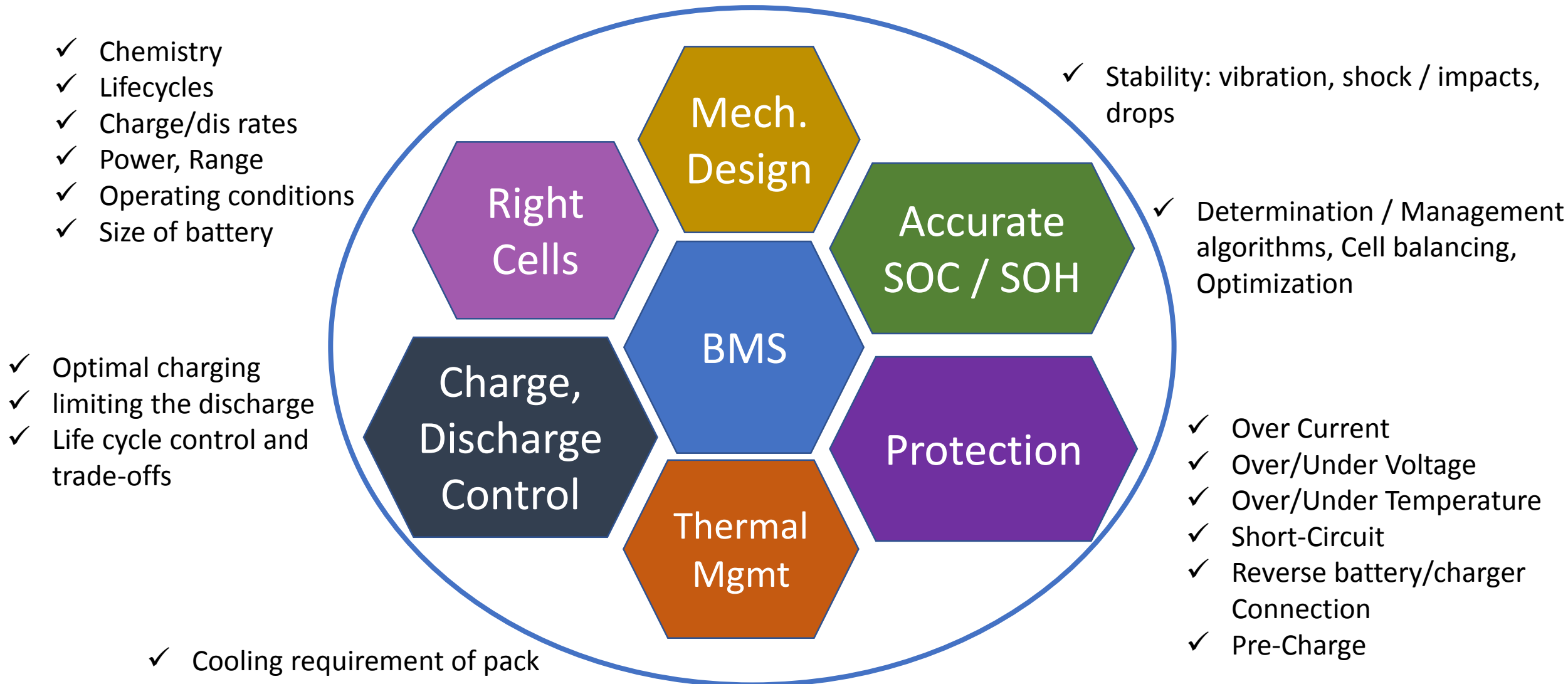
Technology for e-Bus Fleet for STU

e-Fleet Management Platform for STUs

Route Management

Route Optimization with Traffic economic zone

Central Fleet Mgmt. Server

Ticket booking, Arrival Schedule, Estimate Pick up and Drop time. cashless payment interface, grievance /complaints. Emergency Contact/Customer Service

Customer App – E-Bus Ticket Reservation

E-Bus Management

Vehicle Tracking, load updates, speed updates, Vehicle performance mgmt., maintenance scheduling

Track Swapping batteries and Monitor battery performance

Battery Swapping Station

Driver Management

Vehicle assignment to driver, Customer travel details, Route display, Battery Status & Nearest Swapping Station

Vehicle & Battery Performance, Customer detail, Track & Monitor all data's

Inventory updates, customer bookings, live tracking of fleet, fleet schedule

Bus availability, Customer Authentication on boarding, Seat Layout, Dynamic price, Amenities, 24*7 booking support

Dashboard & Analytics

Inventory Management

Ticket Management

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The Bigger Threat

Battery safety: Designing Stage

✓ Chemistry
✓ Lifecycles
✓ Charge/dis rates
✓ Power, Range
✓ Operating conditions
✓ Size of battery

✓ Stability: vibration, shock / impacts, drops

✓ Determination / Management algorithms, Cell balancing, Optimization

Mech. Design

Right Cells

Accurate SOC / SOH

BMS

Charge, Discharge Control

Protection

Thermal Mgmt

✓ Optimal charging
✓ limiting the discharge
✓ Life cycle control and trade-offs

✓ Over Current
✓ Over/Under Voltage
✓ Over/Under Temperature
✓ Short-Circuit
✓ Reverse battery/charger Connection
✓ Pre-Charge

✓ Cooling requirement of pack

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Battery Safety: While in Operations

UTILIZATION OF ASSETS

VEHICLE PERFORMANCE

BATTERIES PERFORMANCE AND SAFETY ALERTS

DRIVING BEHAVIOR AND PATTERN

DRIVER EFFICIENCY

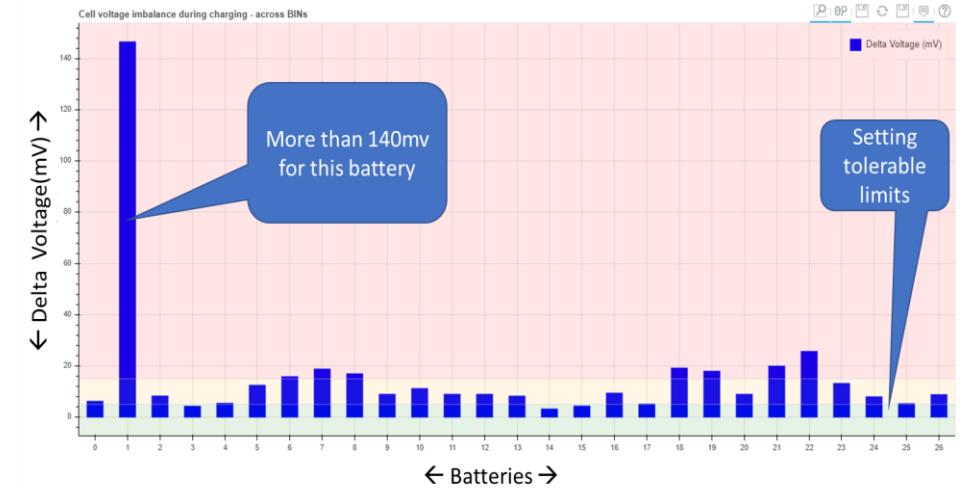**ALERTS ON FAULTS/ERRORS IN ASSETS**
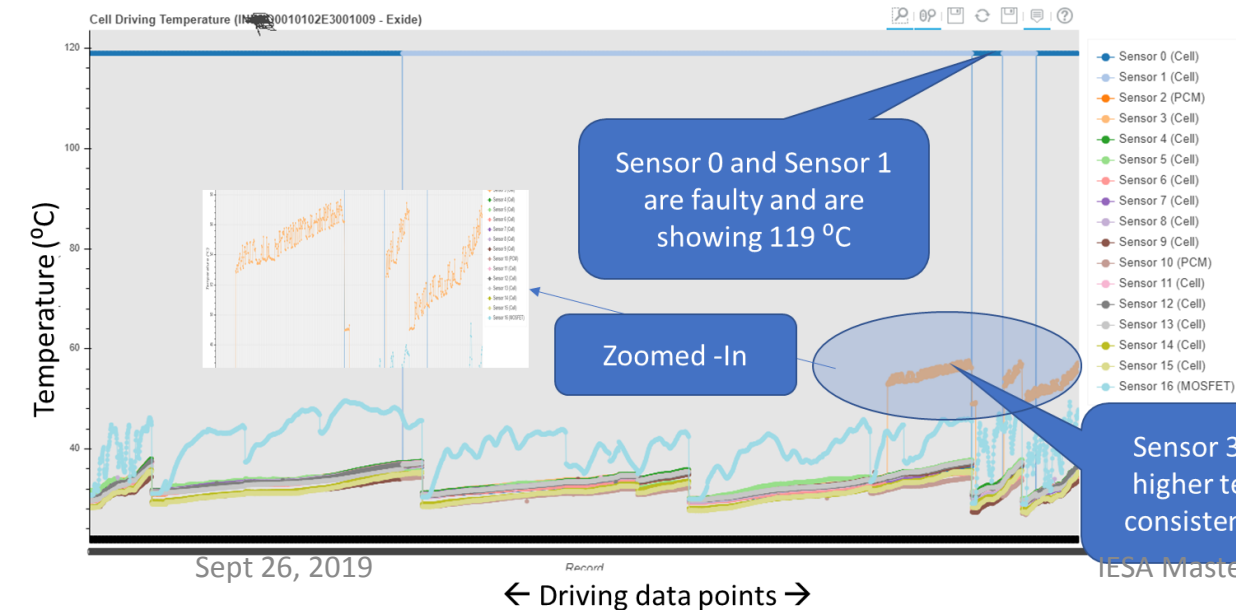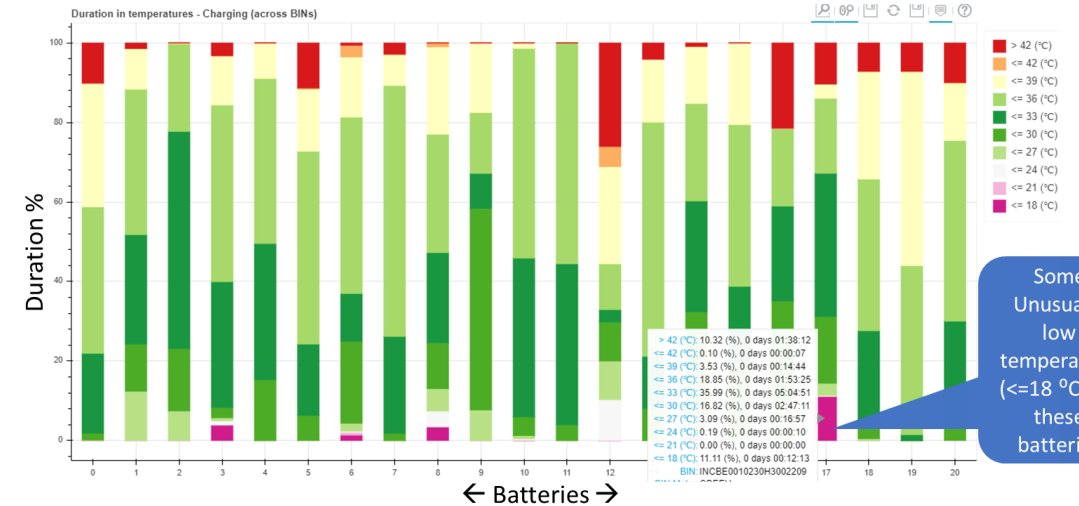
FLEET UTILIZATION ANALYSIS

CUSTOMER FEEDBACK ANALYSIS

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Sample Analytics: Battery

Categories Subsystems

- Predict and Prevent Threats and accidents

- Compare Assets and bring out the best selection

- Aid in Planning and Re-planning of Infra / Network

- Recognise and layout training plans at all levels through data analytics

Batteries
- Filter good batteries from batteries under threat
- Batteries needing maintenance
- Ease in maintenance

Chargers
- Bring out good strategy on type and location of chargers
- A good mix of technology: Swapping and charging
- Re-Planning

Drivers
- Rating of drivers
- Trainings needs recognition with help of data analytics

Vehicles
- Performance comparisons
- Selection and feature selection, packaging of Buses

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