DRIVE TO PERFORMANCE (D2P) HUB

&

D2P BRAND ANALYTICS REPORT

BY

AOEC

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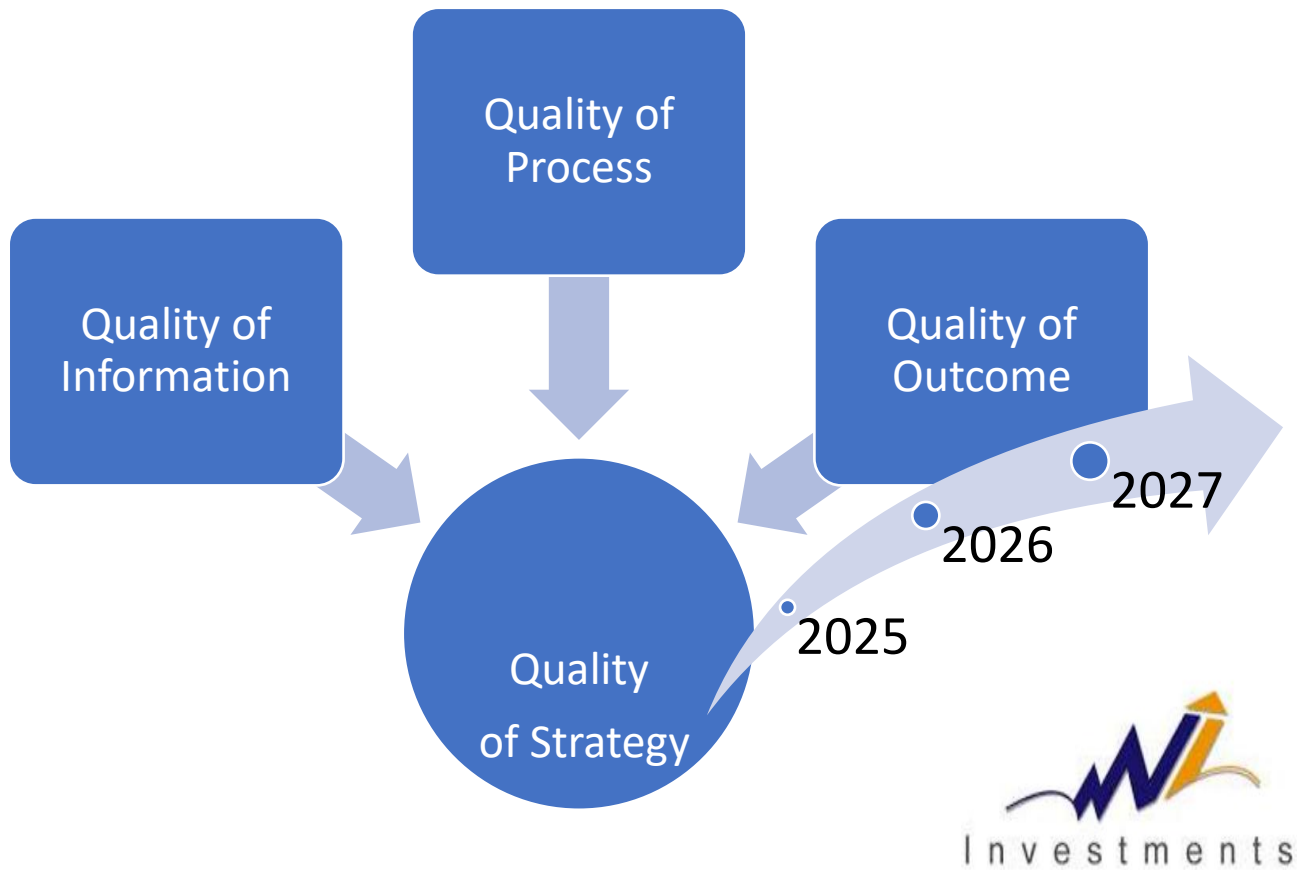**Status: Brand Experience Analysis (Template without explanations)**

DATE: 26th NOVEMBER 2025   Revised: 30th NOVEMBER 2025…

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3. EXECUTIVE SUMMARY

The Case Study focuses on Brand Experience Analytics Via Project Centric forms, questionnaires, surveys and assessments for Drive to Performance (D2P) podium finishes such as

(1) 360-degree Analysis (refer CASE STUDY- APPENDIX I)

(2) Touch Point Analysis (refer CASE STUDY-APPENDIX II)

(3) More QoS Analysis (refer CASE STUDY-APPENDIX III)

For a brand and its need to enter, penetrate and grow in the amateur or professional rally or racing market, Accentuated Drive to Perform (D2P) Brand Analytics is a solution finding that grades or selects vehicles to designs strategies, performance transformations and synergetic performance in this ecosystem.

The steps in Accentuated D2P Brand Analytics are to analyze performance of the brand's vehicles in closed-loop race engineering network and/or independent Analytics Projects/Channelizing networks for factors such as

☐ Vision to identify and address dynamics in the closed loop race engineering network

☐ Excellent `Drive to Perform (Race engineering)` Brand, Vehicle and strategy

☐ Demand and Supply planning strategy for the closed loop race engineering network

☐ Differentiation strategy (for inter-city/state/country racing networks and intra-city/state/country racing networks)

☐ Accentuated D2P Dashboards and `the` Gear-up for the track strategy

☐ Accentuated D2P Dashboards and Race Engineering Process Improvement (REPI) strategy

☐ Sourcing strategy

☐ Gear-up-for-the-track resources or parts management strategy

☐ Accountability for Sustainable racing strategies (SD & G)

☐ Accountability for climate change mitigation

☐ Accentuated Value analysis of the Quality loss function (related to (1) deteriorating QOS, QOO for ESNHG intelligence, (2) aging or not accentuated race engineering infrastructure, resources, assisting vehicles, electronics, systems incorporations, (3) degradation in processes, experiences, rationalization of race engineering costs, performance, safety and responsive accountability etc)

☐ Environmental, Social and National health goals (ESNHG) specific products/services

☐ Transfer of Drive to Perform / REPI Learning products/services based on an emerging "**Accentuate to Enable to Engage**" (A2E-Analytics) strategy for being Global, Mutually Quality accountable and safe

☐ Business model support for closed loop race engineering Tie-ups, Mergers and Acquisitions

4. A NOTE FOR Toyota Gazoo Racing

Name:

Nature of the race engineering network:

5. OBJECTIVES OF THE CASE STUDY
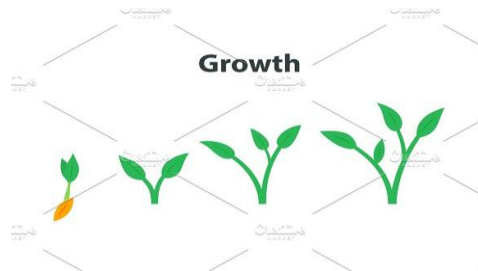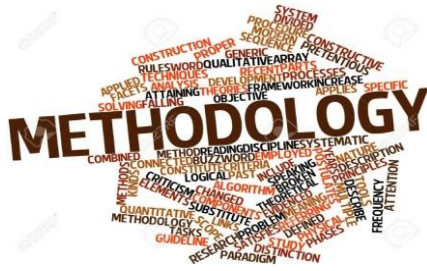
AOEC proposes a D2P Brand Accentuated Dashboard solution that helps accentuate D2P Project Centric rally or race experiences, where control influencers are developed for Hack the Track/race engineering teams of different considerations

o Techno-savvy / Generation NEXT Amateurs
o Amateurs
o Growing in experience Professionals
o Experienced / Skilled up Professionals
o Veteran Categories if applicable

The D2P Brand Accentuated Dashboard incorporates the following Top 5 sustainably strategies or control influencers for the race engineering network and teams

o Timeliness in Manufactured/ CBU/Engineering or Assembled products
o Trusted practices for race-engineering
o SMART Self-organization for Drive to Perform / REPI Learning products/services
o Analytics Projects/Channelizing networks, Surveys and Assessments
o Cognition and Quality for D2P Accentuation

Analytics Projects/Channelizing networks, Surveys and Assessments as an open "Accentuate to Enable to Engage" influencer

Check listed Project Centric forms, questionnaires, surveys and assessments can help understand the perspectives of the race engineering teams and proactive networks

Though the above is vital and being expert-driven, the Cognition and Quality to improve the **"Accentuate to Enable to Engage" influencers** for different Time Motion Scale considerations for Drive performance dimensioning is still pending

The insight being proposed is to design and develop a D2P Accentuated Dashboard to account for

o   A Gear-up-for-the track strategy in terms of the D2P Accentuator Lifecycle
o   A Race Engineering Process Improvement (REPI) strategy for the Critical Interaction Determiners and the SMART resolution of the issues associated with the Drive Performance Dimensioning for the rally/race/track
o   Accentuated Value Analysis for the Drive Performance Dimensioning and
o   The universal expectation to adhere to SMART Environmental, Social and National health goals (ESNHG)

The details for the solution finding is centric to the hackathon or global challenge and is work in progress for factors such as the following

1. Geo-linked Race Engineering: stands for geographical locations with specific Environmental, Social and National health goals

2. Hybridization foundation specific for Race Engineering: stands for SMARTER/Accentuated control of brand specific/universal and project centric practices for race engineering with the needed self-organization for being

3. SMART concept specific for Race Engineering: stands for Specific, Measurable, Achievable. Relevant, and Time oriented geo-linked Cognition and Quality for intelligent solution finding

OR

SPECIFIC CRITICAL INTERACTION FOR MEETING NEED WITH APPLICABLE INSIGHT RESPONSE AND TEMPERAMENT

4. "Accentuate to Enable to Engage" accountability:

Empower a race engineering team via newer ticketing

Enable newer safety engineering for the network/participants/expected teams

Engage newer mitigation, adaptation, and considerations via the newer safety engineering for the race engineering network/ participants/expected teams

6. THE CASE STUDY REPORT

The Case Study report includes ==Key Opinion focus== (or ==Key Opinion Leadership abbreviated as KOL==) for D2P Brand Experience such as

1. Growth areas for the brand and GR vehicles (Refer Chapter 9)
2. Pain points for the brand's closed-loop ecosystem for race engineering (Refer Chapter 9)
3. Pain points for Pit Stop Window/PSW Enabling Workshop (Refer Chapter 9)
4. D2P Brand / Vehicle Responsiveness (Refer Chapter 11)
5. D2P Scorecard Dashboards (Refer Chapter 14)
6. Management methodology furtherance (Refer Chapter 17)
7. Process Improvement steps and PDCA cycles (Refer Chapter 11)
8. Management Accounting Planner (Refer Chapter 16)
9. REPI Cost Control Profiles (Refer Chapter 16)
10. D2P Hub Analytics (Refer Chapter 10*)
11. Vehicle system and sub-system Analytics (Refer Chapter 18*)
12. Optimal PSW Maintenance Scheduling Analysis (Refer Chapter 18)
13. Brand/Vehicle Maintenance System Trend Analysis for the PSW (Refer Chapter 18)
14. Automotive Parts and Lean Waste Analysis (Refer Chapter 13)
15. Dataset Creation (Refer Chapter 14)

7. KEY OPINION FOCUS FOR D2P MISSIONS

We at AOEC envision that developing KOL methodologies for race engineering networks, operating climate engineering solutions and drive performance dimension (DPD) management systems are involvements of conviction that help our automobile industries.

The world is stepping forward in its vision for sustainable development and growth. Today we have different types of demand/supply networks, and operating cycles all working to fulfil different objectives.

A KOL architect today does need to not only better today's planning, design, implementation and management of QCDES (Quality, Cost, Delivery, Environmental friendliness and Safety) relationships & KPI(s) but also needs to look at making them SMART for Global and Mutually Beneficial REPI Objectives / Assurance.

REPI is an abbreviation for Race Engineering Process Improvement for Key Opinion Focus

KPI is an abbreviation for Key Performance Indicators

REGULAR AUTOMOTIVE DEALERS VERSUS DEALERS WHO ARE TGMB HUB MEMBERS

Functions of a Regular Dealer

Sales	Workshop	Spares and Inventory
Test Drive Program	Service Centre network	Road side assistance
System enabled Responsiveness	Technology enabled Responsiveness	
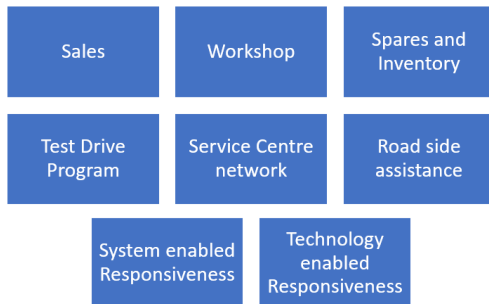
Functions of a TGMB Hub-enabled Dealer

- BPI Codification and Responsiveness
- Sales network enabled assistance
- Service Centre network enabled assistance
- Service Centre/Workshop & assistance
- Spares and Inventory
- Vehicle Quotient Report (A Vehicle Analytic report via Business Intelligence and Machine Learning tools)

AUTOMOTIVE DEALER VERSUS TGMB BPI-ENABLED AUTOMOTIVE BUSINESS

Focus for Regular Automotive Dealer

Sales and Revenue   Operations and Services   Finance management   Business model

Business network   Business development and growth   Business Responsiveness

Focus for a TGMB BPI-enabled Business

- Key Opinion and KPI Leadership
- Choice Rating
- Asset Plan
- Contingency Plan
- PESTLE assistance
- STRIDE Codification and Responsiveness
- Business intelligence and Machine Learning Dashboard & Analytics
- Business intelligence and Machine Learning Reports

AOEC feels that D2P Hubs need to include Do-it-as projects (DIP) frameworks for the following ownership interests of race engineering networks or ecosystems

✓ Nature of ownership for Sustainable development and growth (SD & G) in engineering systems
✓ Nature of ownership for climate change mitigation to limit deterrent to safety and performance

Proof of concept URL for *Futuristic Management Resource Centres*:

https://venkataoec.wixsite.com/resourcecentre

Proof of concept URL for *Green Building Resource Centres*:

https://venkataoec.wixsite.com/gbrc

Proof of concept URL for *Safer Commuting*:

https://venkataoec.wixsite.com/roadsafety-coe

Proof of concept URL for *Business development and growth*:

https://venkataoec.wixsite.com/d2bs

8. Our Online References

AOEC's D2P Hub framework solution can also provide scope for Global and Mutually Beneficial research, competition, acclimatization, and progressive problem evaluations for drive performance dimensioning where process improvements are done keeping in mind sustainable development and growth.

Contents: Some previews of DIY frameworks to help nurture the brand or organization's unique tagline and accelerate towards a unique "Global and Mutually Beneficial" (TGMB) experience.

Work in progress

Proof of concept URL for *Business Tableau (or Tab or Showcase)*:

https://aakkashkvautoengg.wixsite.com/businesstab

Proof of concept URL for changes to vehicles/systems/products:

https://aakkashkvautoengg.wixsite.com/transformviability

Additionally

Please ask for the proof-of-concept URL(s) for automotive brands that we have identified

9. D2P Brand Experience Highlight

GR Brand's tagline:

REPI organization's tagline:

AOEC's tagline for D2P Brand equity:
Accentuate to Enable to Engage for being Global and Mutually Beneficial via a sustainable approach for Key DPD/D2P/REPI objectives such as
1. Brand reliability
2. Brand safety
3. Brand quality
4. Brand's DPD supportive proposition
5. Brand's D2P centricity and department/team satisfaction

==**Growth areas for the business on the basis of the Porters forces and SWOT Analysis**==

A. Analysis of the influences of the Porters forces

1. Threat of new entrants for GR / Rallies/ Racing
Response (tick as applicable)
- o Positive effect
- o Negative effect
- o Mixed effect
- o Not applicable
Key opinion:

2. Bargaining power of REPI businesses or suppliers
Response (tick as applicable)
- o Positive effect
- o Negative effect
- o Mixed effect
- o Not applicable
Key opinion:

3. Bargaining power of REPI manufacturers for Race Engineering Network (REN) buyers
Response (tick as applicable)
- o Positive effect
- o Negative effect
- o Mixed effect
- o Not applicable
Key opinion:

4. Level of competitive rivalry in the REN
Response (tick as applicable)
- o Positive effect
- o Negative effect
- o Mixed effect
- o Not applicable

Key opinion:

5. Threat of substitutes in the REN
Response (tick as applicable)
- o Positive effect
- o Negative effect
- o Mixed effect
- o Not applicable

Key opinion:

B. Analysis of the SWOT implications
The report highlights <mark>Opportunities specific inferences</mark>
1. Future related REN opportunities
Response (tick as applicable)
- o Positive effect
- o Negative effect
- o Mixed effect
- o Not applicable

Key opinion:

2. Sourcing related REN opportunities
Response (tick as applicable)
- o Positive effect
- o Negative effect
- o Mixed effect
- o Not applicable

Key opinion:

3. Forecasted trends related REN opportunities
Response (tick as applicable)
- o Positive effect
- o Negative effect
- o Mixed effect
- o Not applicable

Key opinion:

4. Brand's models or variants specific REN opportunities
Response (tick as applicable)
- o   Positive effect
- o   Negative effect
- o   Mixed effect
- o   Not applicable

Key opinion:

5. Governmental policy and benefits related REN opportunities
Response (tick as applicable)
- o   Positive effect
- o   Negative effect
- o   Mixed effect
- o   Not applicable

Key opinion:

6. Regulatory policy related REN opportunities
Response (tick as applicable)
- o   Positive effect
- o   Negative effect
- o   Mixed effect
- o   Not applicable

Key opinion:

7. Interest in rallies/races/REN shown by amateurs/professionals
Response (tick as applicable)
- o   Positive effect
- o   Negative effect
- o   Mixed effect
- o   Not applicable

Key opinion:

8. Interest in rallies/races shown by targeted REN segments
Response (tick as applicable)
- o   Positive effect
- o   Negative effect
- o   Mixed effect
- o   Not applicable

Key opinion:

9. Profiling of professional or amateur demand for planning of sales and marketing, production etc
Response (tick as applicable)
- o Positive effect
- o Negative effect
- o Mixed effect
- o Not applicable

Key opinion:

10. Events planning for increased REN market share or brand awareness
Response (tick as applicable)

10.1 Events Planning at the Brand-choice-level
- o Positive effect
- o Negative effect
- o Mixed effect
- o Not applicable

Key opinion:

10.2 Events Planning at the Vehicle-level
- o Positive effect
- o Negative effect
- o Mixed effect
- o Not applicable

Key opinion:

10.3 Events Planning at the REN-level
- o Positive effect
- o Negative effect
- o Mixed effect
- o Not applicable

Key opinion:

10.4 Events Planning at the PSW/Workshop level
- o Positive effect
- o Negative effect
- o Mixed effect
- o Not applicable

Key opinion:

10.5 Events Planning at the Rally/Race/REN Relationship level
- o Positive effect
- o Negative effect
- o Mixed effect
- o Not applicable

Key opinion:

<mark>Pain points for the </mark>manufacturer

1. Brand Experience specific
Models:

Variants:

Improved Race Engineering Network (REN) centricity:

2. Investment or costs specific
Models:

Variants:

Improved D2P centricity:

3. REPI Resources specific
Models:

Variants:

Improved D2P centricity:

4. PSW Services specific
Models:

Variants:

Improved D2P centricity:

5. REN specific
Models:

Variants:

Improved D2P centricity:

6. Future prospects
Models:

Variants:

Improved D2P centricity:

1. QCDES compliance of the PSW repairs/replacements/maintenance, that is Quality, Cost, Delivery, Environmental friendliness and Safety
Models:

Variants:

2. PSW Experience specific
Models:

Variants:

3. Vehicle performance specific
Models:

Variants:

4. Vehicle Maintenance specific.
Models:

Variants:

5. Vehicle Spare parts specific
Models:

Variants:

6. Lean Waste specific
Models:

Variants:

7. Future prospects specific
Models:

Variants:

The case study's inferences rely on the following D2P Engagement cycle and its phases
- ❖ Awareness
- ❖ Acquisition
- ❖ Satisfaction
- ❖ Conversion or brand focus
- ❖ Retention
- ❖ Referral

The inferences highlight the effectiveness of the following touch-points (as included in the Case Study – APPENDIX II)

1. Assessment of D2P Interests
Tick as applicable
- ☐ Completely incorporated
- ☐ Partially incorporated
- ☐ Not incorporated
- ☐ Not applicable
Details:

2. Incorporation of D2P need from the manufacturer
Tick as applicable
- ☐ Completely incorporated
- ☐ Partially incorporated
- ☐ Not incorporated
- ☐ Not applicable
Details:

3. Incorporation of DPD/SP-E-P-PI parameters
Tick as applicable
- ☐ Completely incorporated
- ☐ Partially incorporated
- ☐ Not incorporated
- ☐ Not applicable
Details:

4. Incorporation of Processes and/or Analytics to improve REN team's vehicle/DPD/SP-E-P-PI awareness
Tick as applicable
- ☐ Completely incorporated
- ☐ Partially incorporated
- ☐ Not incorporated
- ☐ Not applicable
Details:
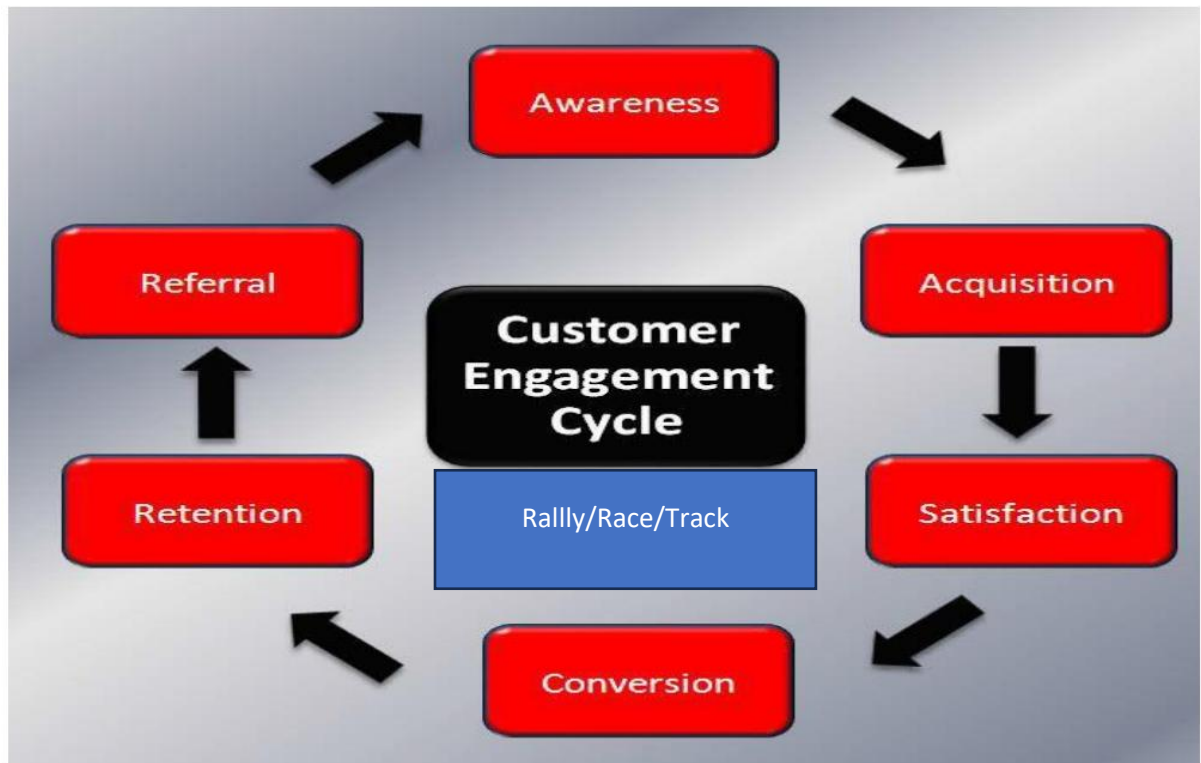
Keeping an eye on different rally/race/track demands, DPD needs and driver & co-driver wants, as well as engage to understand competitive behaviour

Whittington Evolutional school of thought: Marketing communications are for short term survival. Communication decisions are short-term. Intense focus on short-run sales and not long-term brand building.

Whittington Systemic school of thought: Understand consumer behaviour and attitude to develop a better strategy for the future. Consumer behaviour and attitude are confined to social systems involving Norms, Values, Roles, Culture, and Ethics. Marketing communications are for customer sentiments, cultural values and professional pride.

The model involves 4 schools of thought to take this insight forward.

Rational loop where there is rational thought for decision-making.

Overt politics loop where there is the use of influence and connections to assert strategic ideas.

Culture & Cognition loop where strategy is based on the culture of the country and place.

Covert politics loop where there is the use of secretive intent to influence decisions and make strategies for business development and growth.

Vehicles or products/parts/components used in GR/rallying/racing need to incorporate a **drive performance dimensioning (DPD) and competitive insight loop**

DPD/SP-E-P-PI/D2P satisfaction KPI(s)/ Performance metrics and expectations from the organization (Table 6)

This could relate to broad expectations such as

1	Management knowledge for REN
2	Management attitude for REN
3	Discipline for REN
4	Human Relationship in REN
5	Responsibility in REN
6	Positiveness and Stress Management for REN
7	Cost consciousness in REN
8	Job Competency and/or Technical knowledge in REN
9	Communication in REN
10	Creativity for REN
11	Leadership for REN
12	Team building (for driver & co-drive teams, race engineering teams, DPD analytics teams and assisting staff)

Standard Operating Procedures followed (SOP)

To help improve the D2P Brand Experience, a SOP handbook divided into following sections can help

1. Rally/Race/Event Relationship Management (CRM) SOP
2. REN Relationship Management (SRM) SOP
3. Strategic Planning-Engagement- SOP
4. Manufacturer SOP
5. Driver and Co-driver SOP
6. Race engineering team SOP
7. Pit Stop Window (PSW) SOP
8. Workshop SOP
9. DPDs SOP
10. Accounting for **DPD/SP-E-P-PI/D2P** SOP
11. REN Systems management SOP
12. REN Back-office SOP
13. REN Stores and Spares SOP
14. REN Warehouse SOP
15. REN Front-office SOP
16. REN HR SOP

The case study recommends incorporation of the following Key DPD/D2P/REPI KPIs

Tick as applicable

- ❑ **DPD/SP-E-P-PI/D2P satisfaction (based on Key DPD/D2P/REPI objectives)**

- ❑ **Timing and frequency of need**

- ❑ **Complaints and redressal**

- ❑ **Needs-understanding trends**

- ❑ **Demand-fulfilment trends**

- ❑ **Defection trends**

Details:

10. S D & G Profile Highlight

Year: 2025-2026   **Review period(s): Q1/Q2/Q3/Q4/Schedule based**

Sl No	Planning element	Details (Tick as applicable)
1	Business Development and Growth Goals from Event	Available / Not Available
2	Risk Profile for Event	Available / Not Available
3	Return of Investment / Brand Value from /Event	Available / Not Available
4	Liquidity for Event	Available / Not Available
5	Asset Plan for Event	Available / Not Available
6	Contingency Plan for Event	Available / Not Available
7	PESTLE implications for Event	Available / Not Available
8	Public Welfare / CSR for Event	Available / Not Available

Year: 2025-2026   **Review period(s): Q1/Q2/Q3/Q4/Schedule based**

Sl No	Financial Position element	Details (Tick as applicable)
1	Funding components for Event	Available / Not Available
2	Expenses components for Event	Available / Not Available
3	Assets and components for Event	Available / Not Available
4	Liabilities and components for Event	Available / Not Available
5	Insurance (and components) for Event	Available / Not Available
6	Emergency Corpus (and components) for Event	Available / Not Available
7	Net Worth for Event	Available / Not Available

Year: 2025-2026   **Review period(s): Q1/Q2/Q3/Q4/Schedule based**

Sl No	Projection element	Details (Tick as applicable)
1	**Business Development and Growth projections (Rally/Race wise) for Event**	**Available / Not Available**
2	**Business Development and Growth projections (Location wise) for Event**	**Available / Not Available**
3	**Business Development and Growth projections (Racing category wise) for Event**	**Available / Not Available**
4	**Business Development and Growth projections (Global brand wise) for Event**	**Available / Not Available**
5	**Technology Cost projections for Event**	**Available / Not Available**
6	**REPI projections for Event**	**Available / Not Available**
7	**DPD/SP-E-P-PI/D2P R&D Investment projections for Event**	**Available / Not Available**

Year: 2025-2026   **Review period(s): Q1/Q2/Q3/Q4/Schedule based**

Sl No	Physical Assets element	Details (Tick as applicable)
1	REN Rally/Race/Track Simulation Infrastructure	Available / Not Available
2	REN Plant and machinery	Available / Not Available
3	REN Equipment	Available / Not Available
4	REN Associated Facility / Facilities	Available / Not Available
5	REN Systems infrastructure and endpoint management solutions	Available / Not Available
6	D2P Hub-integrated facility	Available / Not Available
7	REN Foreign offices/business sites	Available / Not Available
8	REN Associated NavSite landscape (pincode based Transition index and Risk Quotient)	Available / Not Available

Year: 2025-2026   **Review period(s): Q1/Q2/Q3/Q4/Schedule based**

Sl No	Physical Products element	Details (Tick as applicable)
1	REN specific Bank Account policies	Available / Not Available
2	REN specific Foreign Bank Account policies	Available / Not Available
3	REN specific Credit policies	Available / Not Available
4	REN specific Foreign Exchange policies	Available / Not Available
5	REN Infrastructure related Insurance policies	Available / Not Available
6	REN Field level interaction related Insurance policies	Available / Not Available
7	REN Equity share policies	Available / Not Available
8	REN Equity mutual fund policies	Available / Not Available

Year: 2025-2026   **Review period(s): Q1/Q2/Q3/Q4/Schedule based**

Sl No	Products /Services element	Details (Tick as applicable)
1	Manufactured/CBU/Assembled products/services policies	Available / Not Available
2	Brand specific products/services policies	Available / Not Available
3	Environmental, Social and National health goals (ERNHG) specific products/services policies	Available / Not Available
4	Transfer of Learning products/services policies based on the "Accentuate to Enable to Engage" A2E-Analytics strategy	Available / Not Available

<mark>Incorporating D2P Hub responsiveness</mark>

Year: 2025-2026   **Review period(s): Q1/Q2/Q3/Q4/Schedule based**

Sl No	Programming elements	Details (Tick as applicable)
1	Analytics management for REPI	Available / Not Available
2	Sustainable development and growth for REPI	Available / Not Available
3	NavSite Energy management for REPI	Available / Not Available
4	NavSite Environmental management for REPI	Available / Not Available
5	NavSite Risk mitigation / Contingency management for REPI	Available / Not Available
6	NavSite Disaster management for REPI	Available / Not Available
7	NavSite Bulletin board system for REPI	Available / Not Available
(*)	Fast Track Analytics for REPI	Available / Not Available

Incorporating Fast Track responsiveness

Year: 2025-2026   **Review period(s): Q1/Q2/Q3/Q4/Schedule based**

Sl No	Fast Track Analytics incorporated	Details (Tick as applicable)
1	**Operating Climate Engineering policies**	**Available / Not Available**
2	**Demand and Supply Balancing policies**	**Available / Not Available**
3	**Recombinant Synergy for SD & G/REPI policies**	**Available / Not Available**
4	*Deeper Analytics and parameters for REPI policies*	**Available / Not Available**
5	*Synergetic Safety compliance for REPI policies*	**Available / Not Available**
6	**Accelerating REPI Technology/Systems/Products/Services adoption**	**Available / Not Available**

D2P Hub Member Analytics (using BI/ML Tools)

Year: 2025-2026   **Review period(s): Q1/Q2/Q3/Q4/Schedule based**

Sl No	Analytics incorporated	Details (Tick as applicable)
1	D2P Business Intelligence policies	Available / Not Available
2	D2P NavSite hypotheses testing policies	Available / Not Available
3	D2P PESTLE hypotheses testing policies	Available / Not Available
4	D2P Hub synergy testing policies	Available / Not Available
5	D2P Time-Motion-Scale study systems policies	Available / Not Available

REPI is an abbreviation for Race Experience Process Improvement or Intelligence

ML is an abbreviation for Machine Learning

11. Race Engineering Process Improvement (REPI) Highlight

<mark>**Recommended Race Engineering Process Improvements (REPI(s)) in**</mark>

<mark>**Name of the Race Engineering Process:**</mark>

<u>Tick where applicable:</u>

o SP-E-P-PI Assistance
o DPD Assistance
o D2P Assistance
o PSW/Workshop Assistance
o Accidental Repair Assistance
o Road-side/On-track Assistance

<u>Recommendations:</u>

❑ **Focus on how a task is being performed by measuring performance and as applicable how goals are being achieved**

❑ **Identify deviations and other compliance issues**

❑ **Develop or Validate automated actions to improve process performance via metrics, learning & mining, via**

  ❑ **Manage-Improve-Automate REPI programs (practically seen to result in productivity improvement of about 30%)**

  ❑ **Needs-understanding trends**

  ❑ **Demand-fulfilment trends**

  ❑ **Quality and Error rate trends**

  ❑ **DPD/SP-E.-P-PI/D2P satisfaction or issues trends**

<u>Details:</u>

<u>Name of the Race Engineering Process:</u>

<u>Tick where applicable:</u>

o SP-E-P-PI Assistance
o DPD Assistance
o D2P Assistance
o PSW/Workshop Assistance
o Accidental Repair Assistance
o Road-side/On-track Assistance

<u>Recommendations:</u>

- ❑ **Focus on how a task is being performed by measuring performance and as applicable how goals are being achieved**

- ❑ **Identify deviations and other compliance issues**

- ❑ **Develop or Validate automated actions to improve process performance via metrics, learning & mining, via**

  - ❑ **Manage-Improve-Automate REPI programs (practically seen to result in productivity improvement of about 30%)**

  - ❑ **Needs-understanding trends**

  - ❑ **Demand-fulfilment trends**

  - ❑ **Quality and Error rate trends**

  - ❑ **DPD/SP-E.-P-PI/D2P satisfaction or issues trends**

<u>Details:</u>

Name of the Race Engineering Process:

Tick where applicable:

o SP-E-P-PI Assistance
o DPD Assistance
o D2P Assistance
o PSW/Workshop Assistance
o Accidental Repair Assistance
o Road-side/On-track Assistance

Recommendations:

❑ **Focus on how a task is being performed by measuring performance and as applicable how goals are being achieved**

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> ❑ **Needs-understanding trends**

> ❑ **Demand-fulfilment trends**

> ❑ **Quality and Error rate trends**

> ❑ **DPD/SP-E.-P-PI/D2P satisfaction or issues trends**

Details:

Tick where applicable:

- o SP-E-P-PI Assistance
- o DPD Assistance
- o D2P Assistance
- o PSW/Workshop Assistance
- o Accidental Repair Assistance
- o Road-side/On-track Assistance

Recommendations:

❑ **Focus on how a task is being performed by measuring performance and as applicable how goals are being achieved**

❑ **Identify deviations and other compliance issues**

❑ **Develop or Validate automated actions to improve process performance via metrics, learning & mining, via**

   ❑ **Manage-Improve-Automate REPI programs (practically seen to result in productivity improvement of about 30%)**

   ❑ **Needs-understanding trends**

   ❑ **Demand-fulfilment trends**

   ❑ **Quality and Error rate trends**

   ❑ **DPD/SP-E.-P-PI/D2P satisfaction or issues trends**

Details:

<mark>Name of the Race Engineering Process:</mark>

Tick where applicable:

o   SP-E-P-PI Assistance
o   DPD Assistance
o   D2P Assistance
o   <mark>PSW/Workshop Assistance</mark>
o   Accidental Repair Assistance
o   Road-side/On-track Assistance

Recommendations:

❑ **Focus on how a task is being performed by measuring performance and as applicable how goals are being achieved**

❑ **Identify deviations and other compliance issues**

❑ **Develop or Validate automated actions to improve process performance via metrics, learning & mining, via**

  ❑ **Manage-Improve-Automate REPI programs (practically seen to result in productivity improvement of about 30%)**

  ❑ **Needs-understanding trends**

  ❑ **Demand-fulfilment trends**

  ❑ **Quality and Error rate trends**

  ❑ **DPD/SP-E.-P-PI/D2P satisfaction or issues trends**

Details:

36

Tick where applicable:

o   SP-E-P-PI Assistance
o   DPD Assistance
o   D2P Assistance
o   PSW/Workshop Assistance
o   Accidental Repair Assistance
o   Road-side/On-track Assistance

Recommendations:

❑ **Focus on how a task is being performed by measuring performance and as applicable how goals are being achieved**

❑ **Identify deviations and other compliance issues**

❑ **Develop or Validate automated actions to improve process performance via metrics, learning & mining, via**

   ❑ **Manage-Improve-Automate REPI programs (practically seen to result in productivity improvement of about 30%)**

   ❑ **Needs-understanding trends**

   ❑ **Demand-fulfilment trends**

   ❑ **Quality and Error rate trends**

   ❑ **DPD/SP-E.-P-PI/D2P satisfaction or issues trends**

Details:

<mark>Name of the Race Engineering Process:</mark>

Tick where applicable:

o   SP-E-P-PI Assistance
o   DPD Assistance
o   D2P Assistance
o   PSW/Workshop Assistance
o   Accidental Repair Assistance
o   <mark>Road-side/On-track Assistance</mark>

Recommendations:

❑ **Focus on how a task is being performed by measuring performance and as applicable how goals are being achieved**

❑ **Identify deviations and other compliance issues**

❑ **Develop or Validate automated actions to improve process performance via metrics, learning & mining, via**

  ❑ **Manage-Improve-Automate REPI programs (practically seen to result in productivity improvement of about 30%)**

  ❑ **Needs-understanding trends**

  ❑ **Demand-fulfilment trends**

  ❑ **Quality and Error rate trends**

  ❑ **DPD/SP-E.-P-PI/D2P satisfaction or issues trends**

Details:

<mark>Recommendation to enable Race Engineering Network (REN) Process Metrics for</mark>

<u>Tick as applicable:</u>

- ❑ **Process effectiveness (Quality, Error rate, DPD/SP-E-P-PI/D2P satisfaction or issues)**

- ❑ **Process efficiency (Cost, Resource efficiency, QCDES compliance)**

- ❑ **Process Cycle time (Total lead time/Throughput time, Value-added time, Turnaround time)**

- ❑ **Process compliance (Risk mitigation timeframe, Mean time to issue resolution, ESG performance via <u>Environmental, social and governance reporting</u>)**

  - ❖ **<u>Environmental, social and governance reporting</u> shows the non-financial impact and compliance level with standard procedures and rules in the regions the firm operates through ESG <u>metrics</u>/Porter's 5 forces culture theory/PESTLE inferences).**

Details:

<mark>Recommendation to enable Race Engineering Process Learning or Mining for</mark>

<u>**Tick as applicable:**</u>

- ❑ **Discovery of Manage-Improve-Automate insights/programs**

- ❑ **Process optimization**

- ❑ **Conformance Validation**

- ❑ **Process synergy/distinctiveness**

- ❑ **Process predictability/simulation**

- ❑ **Organizational performance behavior**

- ❑ **QCDES compliance trends**

- ❑ **Event based cash cycles**

- ❑ **IT Services implementations and/or BI & Data Analytics for (REPI/Process Management with or without Root Cause Analysis/QCDES Auditing & Compliance/Event Relationship Management/D2P/DPD Management/Logistics Management/REN Teamwork Management/PSW Teamwork management)**

Details:

<mark>Recommendation to develop a process improvement plan/project plan to help in</mark>

<u>Tick as applicable:</u>

- ❑ **Identifying D2P challenges early**

- ❑ **Increasing D2P efficiency**

- ❑ **Correcting D2P errors**

- ❑ **Eliminating or reducing D2P process waste**

- ❑ **Managing D2P downtime**

- ❑ **Tracking DPD/SP-E-P-PI/D2P responsiveness**

- ❑ **Tracking D2P value stream connected inventory**

Details:

<mark>Recommendation that the process improvement plans/project plans involve</mark>

<u>Tick as applicable:</u>

- ❑ **Analyzing the current processes for a D2P/SP-E-P-PI/DPD function**

- ❑ **Creating a process management outline for a D2P/SP-E-P-PI/DPD function**

- ❑ **Reviewing, designing, and/or redesigning each process**

- ❑ **Assigning resources & resource roles and implementing the plan**

- ❑ **Reviewing the implementation and progress regularly**

- ❑ **Designing and incorporating quality control & change management**

- ❑ **Using Lean Six Sigma DMAIC or DMDV approaches for process improvement**

- ❑ **Designing Initiation, Planning, Execution, Monitoring, and Completion phases for the process improvement**

- ❑ **Adding Continuous Improvement opportunities**

- ❑ **Selecting and using tools for D2P Process Visualization, Collaboration, Planning & Scheduling, Productivity & Performance Evaluation, Content and Document management & storage**

Details:

12. Logistics Highlight for DPD/SP-E-P-PI/D2P efficiency

Recommended Metrics for Logistics

Tick as applicable:

- o **REN Sourcing metrics**

- o **REN Infrastructure/ REN Facility metrics**

- o **REN Inventory metrics**

- o **REN Information metrics**

- o **REN Pricing metrics**

- o **REN Big data metrics**

Details:

<mark>Recommended KPIs for Logistics</mark> for DPD/SP-E-P-PI/D2P

Tick as applicable:

- o **Supplier KPIs**

- o **Warehouse KPIs**

- o **Transportation KPIs**

- o **DPD/SP-E-P-PI/D2P functions KPIs**

Details:

Data available for D2P Logistics (Tick as applicable)

- Vehicle/Products/Parts/Systems descriptions
- Inventory (Source) volume
- Demand (Sink) volume
- Location information (name, city, country)
- Time period descriptions
- Route descriptions
- Transport modes types and costs

- Details:

Sources of data for D2P Logistics (Tick as applicable)

- DPD/DP-E-P-PI/D2P/REPI systems
- Order management systems
- Material management systems
- Route optimization systems
- IoT systems

- Details:

<mark>Recommendation to improve D2P Logistics via improvement of</mark>

Tick as applicable:

- o **Inventory management**

- o **Warehouse management**

- o **Supplier Risk management**

- o **Maintaining perishable products integrity**

- o **Increased Race Engineering Process satisfaction (based on DPD/SP-E-P-PI/D2P effectiveness)**

- o **Demand forecasting**

- o **Route optimization**

- o **Developing metrics**

- o **KPI Performance management**

Details:

==MARKER==

Recommended incorporation of the following D2P Sourcing metrics

Tick as applicable:

- ❑ **Supplier relationship**
- ❑ **Supply lead time**
- ❑ **Supply quality**
- ❑ **% of on-time deliveries**
- ❑ **Average purchase price**
- ❑ **Range of purchase price**
- ❑ **Average purchase quantity**
- ❑ **% outstanding deliveries**

Details:

<mark>Recommended incorporation of the following Event Related Infrastructure/Warehouse metrics</mark>

Tick as applicable:

- ❑ **Capacity**
- ❑ **Utilization**
- ❑ **Downtime or idle time**
- ❑ **Vehicle/Product/Part Variety**
- ❑ **Average vehicle/product/part size**
- ❑ **D2P service level**
- ❑ **Volume contribution for D2P service level**
- ❑ **QCDES losses**
- ❑ **Cycle specific Setup time or processing time**
- ❑ **Delivery cost per unit**
- ❑ **Theoretical flow or cycle time**
- ❑ **Actual average flow or cycle time**

Details:

<mark>Recommended incorporation of the following D2P Information metrics</mark>

<u>Tick as applicable:</u>

- **C2C cycle time (inventories, management accounting for D2P mission)**

- **Inventory turnover (related to holding for D2P mission)**

- **Average inventory**

- **Average replenishment batch size**

- **Average safety inventory**

- **Seasonal inventory**

- **Supporting inventory**

- **Event specific replenishment rate**

- **Event specific Out of stock**

Details:

Tick as applicable:

- ❑ **Brand Equity margin**

- ❑ **Average event specific price**

- ❑ **Average range of D2P/SP-E-P-PI/DPD functions price**

- ❑ **Range of periodic D2P/SP-E-P-PI/DPD functions price**

- ❑ **Average order size for D2P/SP-E-P-PI/DPD functions**

- ❑ **Increased fixed cost per order**

- ❑ **Increased variable cost per order**

- ❑ **% outstanding deliveries**

Details:

Tick as applicable:

- ❑ **Reliability for event, that is the number of vehicles/products/parts supplied on time and in good condition (as a consignment, batch/shipment, total goods)**

- ❑ **Multiple new stocks or demand-fulfilling deliveries each week/cycle for event**

Details:

<mark>Recommended incorporation of the following D2P Warehouse KPIs</mark>

<u>Tick as applicable:</u>

- ❏ **Warehouse utilization (occupied area/total area)**

- ❏ **Storage duration**

- ❏ **Inventory cost rate (inventory cost/inventory value)**

- ❏ **Sum of material outflow**

Details:

<mark>Recommended incorporation of the following D2P Transportation KPIs</mark>

<u>Tick as applicable:</u>

- ❑ **On-time deliveries**
- ❑ **Cost per transport**
- ❑ **Average outbound and inbound transportation cost**
- ❑ **Average outbound and inbound shipment size**
- ❑ **Fraction transported by a mode**
- ❑ **Average outbound and inbound transportation cost per shipment**

Details:

13. CCMA Highlight for DPD/SP-E-P-PI/D2P effectiveness

Nutshell Inventory and climate change mitigation

Automotive businesses participating in rallies/races need Parts, Spares and Consumables, but there is no Lean Waste framework that can identify, evaluate and reduce the ensuing carbon footprint / climate change due to adverse effects of products including or even transforming the use of lubricants, oils, plastics or plastic transformatives.

We think that Lean waste frameworks can reduce costs and add transformative solutions for a programmed and greener race/rally environment.

To deploy transformative solutions for a programmed and greener race/rally environment, there are factors such as:

- ❑ Demand/supply planning & Logistics
- ❑ CCMA algorithm programming or REN process improvement without disruption, with adherence to multi-regulated norms, and the protection of long term investments
- ❑ Right to Education for addressable areas and problem solving
- ❑ REN Relationship Management
- ❑ Supplier Relationship Management
- ❑ DPD/SP-E-P-PI/D2P Relationship Management
- ❑ STRIDE & PESTLE Issue Management

Parts, Spares, and Consumables all depend on D2P Logistics for

- ❖ Packaging
- ❖ Transportation via Air, Ocean, Rail, Surface (Road)
- ❖ Distribution
- ❖ Warehousing
- ❖ Insurance Brokerage
- ❖ Delivery

where there is focus on inelastic, elastic and semi-elastic use of these parts, spares and consumables, we recommend a solution where there is an effort to map, choreograph or reduce this utilization. The D2P logistics for all this is wide open.

Adding transformative solutions for a programmed and greener race/rally environment

Via our analysis, we at AOEC find that there are 2 main options

(1) Survey the feedback of what automotive companies participating in races/rallies think about Lean Waste choreography for their Parts, Spares and Consumables

(2) Incorporate a CCMA algorithm or business process improvement to choreograph the waste management/transformation to a programmed and greener race/rally environment

We find that the survey can be done via a method called Demand and Supply Admittance, where a manufacturer & service providing business identify the need and how this need is met

Today most service providing businesses in the automotive industry are specifically planned, IT based and SOP based in how they source or reorder parts, spares and consumables from manufacturers, but this is not yet transformative for a programmed and greener rally/race environment.

The need is for Key Opinion Leadership altogether. We think there is knowledge in the industry to achieve this. We think the industry can fast track to add CCMA-enabling UPC 12 digit barcoding which uses the existing knowledge, problem solving and trends known to design a newer emergence.

What can be implemented via this UPC 12-digit barcoding?

- ❑ **We can help map 4P(s) with 5M(s) logistics for an automotive part, spare and consumable used in rally/race environments**

- ❑ **We can include foreseeable focus for inelastic, elastic and semi-elastic use** of a part, spare and consumable

- ❑ **We can include flagging for any impact or adverse effects** caused by the parts, spares and consumables

- ❑ We can **include a Lean Waste rating that indicates waste reduction performance levels**, to help a REN department/team/supplier/producer or business know there is newer emergence in how this part, spare and/or consumable is managed for all logistics and choreographed utilization

The CCMA algorithm programming behind the unified endeavor is interrelated with many aspects, but here are the highlights of some of the steps…

- Value stream connected inventory (of Parts, Spares and Consumables)

- Socio-Economic Impact Assessment (STRIDE & PESTLE issues)

- Lean Waste Profiling and Data creation tools (identification)

- Lean Waste Choreograph design for Key Opinion Leadership of Logistics

- Lean Waste Knowledge Area development

- Lean Waste Parameter development

- Assisting Revenue, Pricing, and Forecast stage

- Real-world Use case validation stage

14. PROMOTION AND BRAND EQUITY DEVELOPMENT FOR D2P missions

Mission and Vision for the 3 level producer/consumer model (Figure 4)
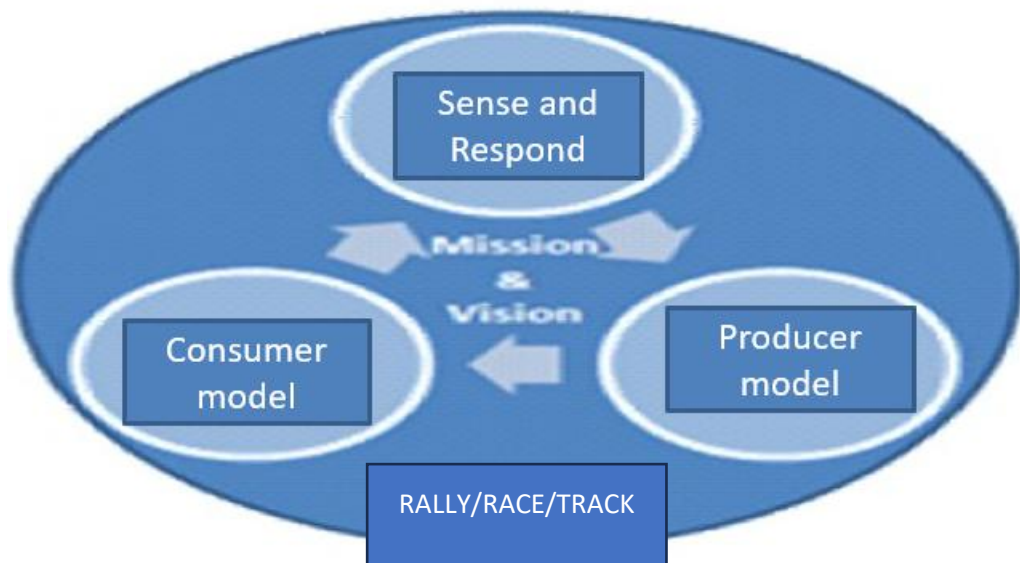
The Performance metrics considered for this are

1. REN Market share

2. Return on total REN assets

3. Average annual market share growth for the past ___ years

4. Average annual sales growth over the past ___ years

5. Average annual growth in return on total assets over the past ___ years

6. Average REN operations cost

7. Overall REN lifecycle cost

8. Overall REN performance costs

9. Overall REN competitive position costs

The typical Cost profile for a REN event

Total costs for REN event = Costs (D2P Project centre) + Costs (REN Operations) + Costs (REN Lifecycle) + Costs (REN Manpower) + Costs (REN Processes) + Costs (REN Measures and Metrics) + Costs (REN Tools and Technology) + Cost (REN Administration) + Costs (REN Inventory) + Costs (REN Spares) + Costs (REN CRM)

Strategic areas for promotion and brand development

Area 1: Rally/Race Promotion for brand development

Practice 1: Business policy for promotion

a. Structured D2P Innovation

b. Structured Promotion for brand's entry into REN

c. Being REPI based

d. Responsiveness to short-term cash expectations or long-term needs of REN

e. Training to understand expectation, circumstantial need and benefit analysis for the REN

f. Trends inferring to be DPD/D2P focused to stimulate REN value and market penetration

g. Gathering of inputs and feedback for Unique REN Points or D2P Mix that is Vehicles/Products/Systems needed, Prices expected, Promotions due and Places / Modes for delivery

h. Relevant and Bias-free REPI process

i. Regard for D2P mission/innovation time for DPD/SP-E-P-PI/D2P objectives

j. Regard for environmental safety

k. Focus on compatibility for Good standard of QCDES, Professional REN interaction, Intelligence conditioning for DPD/D2P Needs identification with required Level of sophistication in methods adopted

l. Regard for brand equity in REN vehicles/products/parts, services and communication

Practice 2: A value added After Rally/Race policy

- Checklist for quality, cost, delivery, environmental friendliness and safety assurance
- Relevant returns or reject policy for QCDES
- Stand taken for responsiveness to build trust with valuable QCDES
- Information inferring to become preferred go-to-manufacturer for REN
- Help benefits-understanding for the REN
- Non-manipulative problem solving for REPI

Practice 3: Dependable Quality of strategy- terms and conditions

- Right methods/approach for QCDES
- Right methods/approach for REPI for QCDES
- Right methods/approach for REN accentuation
- Right methods/approach for any REN promotion
- Ensure REPI responsiveness
- Ensure environmental safety
- Trends based process for ensuring quality of vehicle/product/system/service

Practice 4: <mark>Brand Equity policy</mark> for QCDES and REPI for REN

- Build D2P strategy based on the **QCDES and REPI for REN** vision
- Build brand via Right vehicle/product/system/service, Competitive price, Effective promotion and Relevant DPD/D2P policy with accountable influencer* and REN psychology

Note

Influencers: QCDES, REN Return/Reject policy, After-rally/race Reviews, Feedback and Grievance Redressal

Practice 5: Design periodic SWOT analysis of DPDD2P functions for this vehicle/products/parts/systems (Table 7)

SWOT background	Details
Strengths	For Race Analytics and Drive Performance Dimensioning For Drive to Perform for Brand Analytics and Race Analytics
Weakness	Agility for DPD/D22P support for higher standards in QCDES and processes are to work effectively amidst change and critical touch points
Opportunities	Steady D2P needs where time bound vehicle/product/part/system supply is the primary factor for winning rallies/races
Threats	The need to align with excellence required for REN platform Sustain through any drop in funding for engineering/design excellence Address drop in REN volume with due regard for limitations / competition transformed with the DPD/D2P Brand & Race Analytics approach

Practice 6: Aspire for the expected 4 skills

6.1. Concepts based on the Brand Analytics and Race Analysis/ experience

6.2**. Being an <u>Active Analytics Role Player</u>**.

6.3. Ensuring a Brand & Race responsive **Professional approach and compatibility**

Note on <u>Professional approach and compatibility</u> points for winning rallies/races:

Practice 7: Working out DPD/SP-E-P-PI/D2P strategies for the REN segment

7.1. Plan perspective-driven REN Promotion, D2P Value system, Rally/Race/Track Engagement and <u>SP-E-P-PI</u>/Communication, where the processes involve the connected planning, development and process improvement for the 3 level producer/consumer model

7.2. Execute all REN engagement with a D2P Value system Enabling & Communications Foundation (Figure 5)
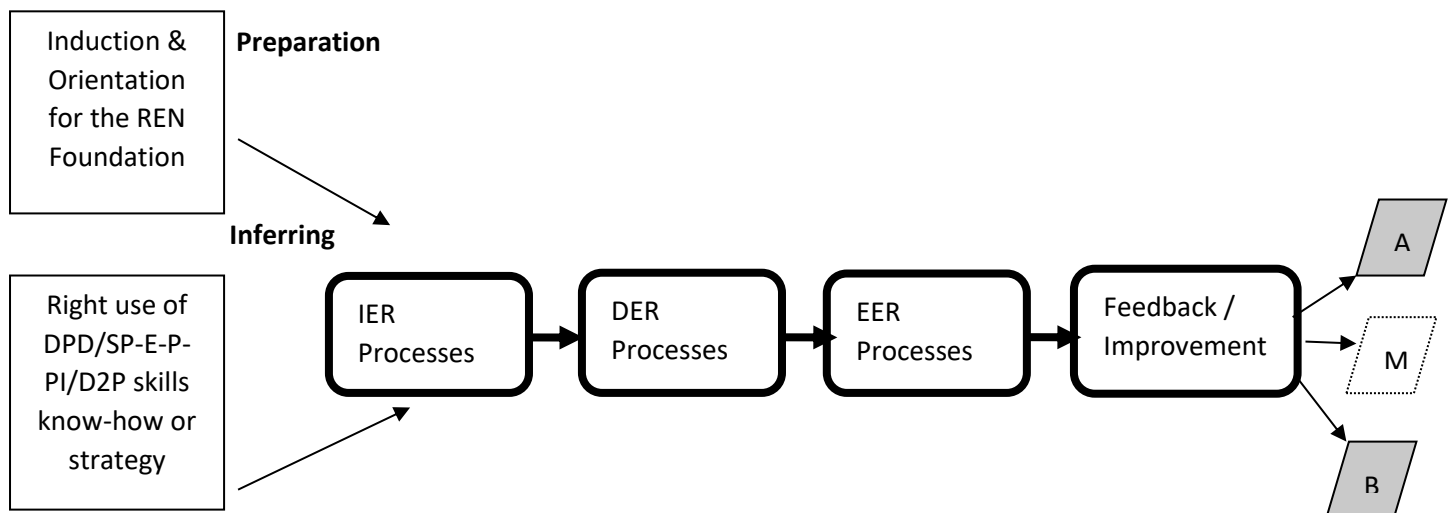
Explanation of short forms:
IER: Initiating Rally/Race/Event Relationship
DER: Developing Rally/Race/Event Relationship
EER: Enhancing Rally/Race/Event Relationship
A: AIDA improvement (related to A: Attention of REN departments/teams I: Interest of REN departments/teams, D: Desire of REN departments/teams and A: Action of REN departments/teams
B: Handling Objection or Rejection in relevance to role
M: Maximize Value Proposition, Event and Public Relation Potential

7.3. Design right alignment for the REN functions of the brand (Figure 6)
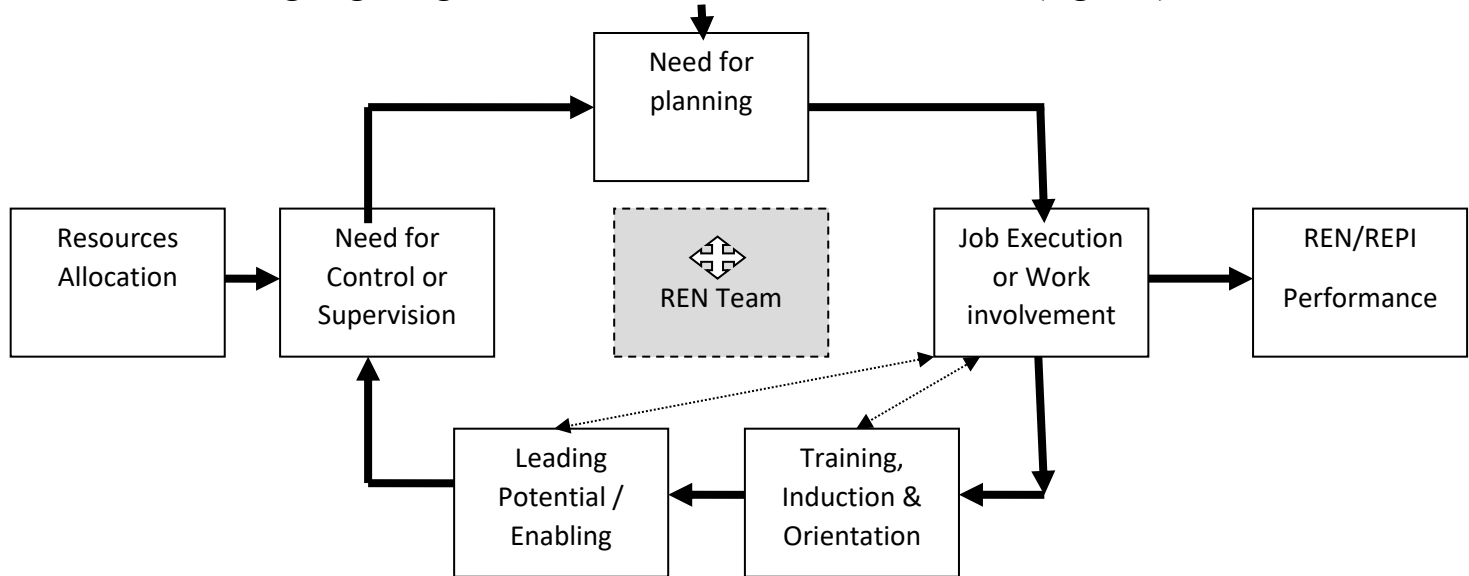
7.4 Develop a holistic REN/REPI process that is likely to occur in order to make a mission successful for event planning, engagement, participation and podium finish

1. As the REN/REPI Team, first interests would be **to understand the role of the REN teams/departments from the brand's point of view**

2. Due to the REN vehicles/products/parts/systems and services being of niche and often life critical value, the **know-how of making a mission successful**

3. **Review of knowledge bases** to understand past experiences, mission know-how/ REN/REPI Foundation that induces a right approach to brand positioning and rally/race/event investments and engagements

4. Systematic **use of REN/REPI functions**

5. **Use of Brand Analytics and Race Analytics channel building, channel management, REPI strategies and logistics management**

6. **Reports preparation, inputs, feedback** to brand development and/or vehicle specification sheet foundations

7. **Inputs on performance of know-how, processes, technology and emergent needs for a REN/REPI Foundation based rally/race/event experience**

Also important would be the

Figure 7: Designing a planned REN organizational hierarchy

```
                        ┌─────────────────┐
                        │  Manufacturer   │
                        └────────┬────────┘
        ┌──────────┬─────────────┼──────────────┬──────────────┬──────────────┐
┌───────┴──────┐┌──┴──────┐┌─────┴──────┐┌───────┴───┐┌─────────┴────────┐┌────┴────────┐
│    REN       ││  REPI'  ││  Design /  ││ Logistics ││      REN         ││ REN Systems/│
│ Development  ││         ││Development ││           ││ QCDES Value      ││ Technology  │
│ / Promotion  ││Research ││            ││           ││ additions/       ││             │
└──────────────┘└─────────┘└─────┬──────┘└───────────┘│ Infrastructure / ││             │
                                 │                     │                  ││             │
                        ┌────────┴─────────┐           │ Functions and   │└─────────────┘
                        │ REN Departments/ │           │ Services         │
                        │      Teams       │           └──────────────────┘
                        └──────────────────┘
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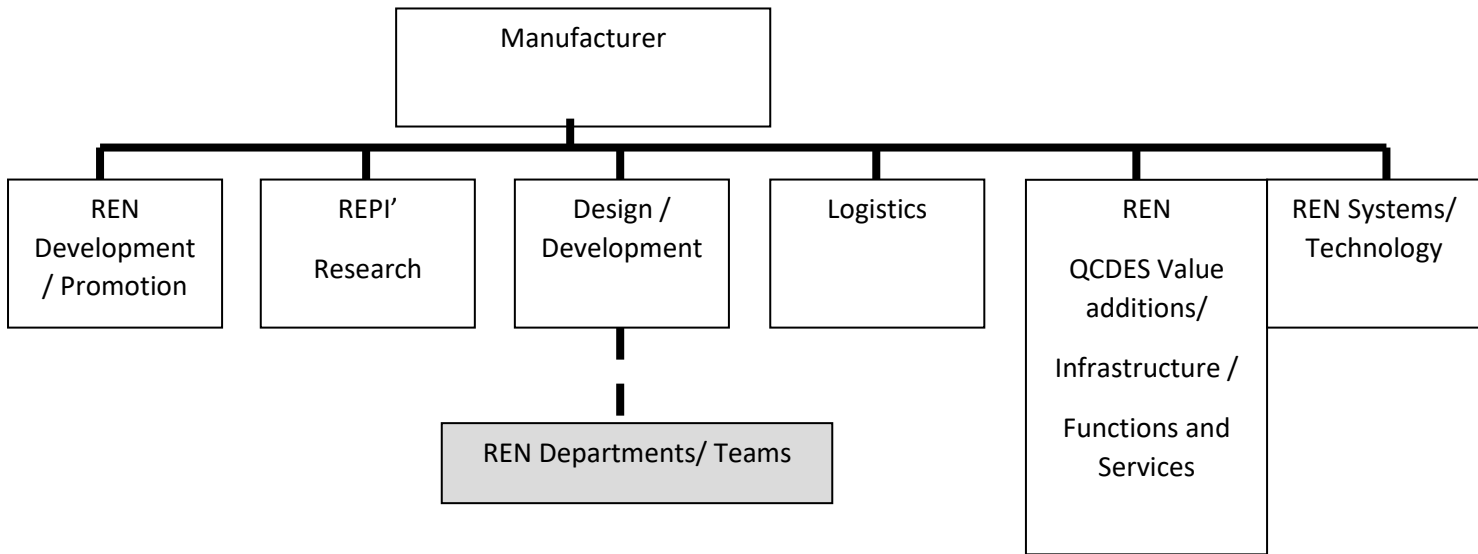
As REN organizational responsive, we also thought it important to add baseline details that highlight what is important about these functions.

Table 8: Baseline Details 1: Comparison of REN value systems and REPI functions

REN Value systems	REPI functions
Create pull for race engineering	Create push for brand/race engineering
Identify and define DPD/SP-E-P-PI mix	Persuade D2P engineering workflows
Aim to increase revenue by RALLY/RACE/TRACK research, 360-degree evaluation of REPI functions	Increase and evolve tactics and action plans to maximize D2P
Design and Build REN equity	Enhance brand equity Use unique D2P points
Feedback and inputs to REPI departments/teams	Feedback and inputs to maximize D2P
Design and Build D2P mix of 4P(s), Vehicles/Products/Parts/Systems, Prices, Promotions and Places available	Enhance REN share using 4P(s) via D2P Leadership, Brand Analytics Management and Race Analytics Supervision
REN Market penetration	Decide on new or improved analytics channels Improve logistics

Table 9: Baseline Details 2: The expected REN/REPI functions for this brand

REN/REPI Department	Functions
Brand Analytics	- Win new business - Increase revenue - REN engineering in mainline manufacturing
Race Analytics	**Know-how, processes, technology and emergent needs for a REN/REPI Foundation based rally/race/event experience**
Brief on the 6 Vital ingredients for REN / REPI missions	- Sound and Relevant 2W/4W/REN and manufacturer specific knowledge - Competitive REN industry knowledge - Awareness of company's REN policy, key departments and people - Accountable REN vehicles/products/parts/systems/services knowledge - REN / REPI engineering skills of the furtherance for mission critical functions era - Positive and enthusiastic attitude to earn REN/REPI trust, relate to D2P need with Analytics oriented synergy, also address Field level circumstantial need

Table 10: Baseline Details 3: The synergetic relationship between REN / REPI and DPD/SP-E-P-PI/D2P objectives for the brand

Business function	REN Brand Marketing	REPI dashboarding or deal making for scoring high
Win new business via engineering excellence	Market Research strategy Forecast and budget REN/REPI approach for Business relationship and dashboarding 5Ms stand for Manpower, Machines, Methods, Measurements and Management including BI/CQI/AI/Machine Learning	REN strategy Enable REPI via analytics channel building resources based on the 5M(s) framework to enquire, relate, recommend and sell Select priority / motivation for each rally/race/event for DPD effectiveness
Increase brand importance enabled revenue	Develop tactics to gain value in the REN market Negotiate and sign REPI agreements with suppliers/mission critical businesses for proactive problem solving in engineering roles that include systematic process improvement, with D2P leadership and innovation milestones	REPI related Engineering Dimension Analytics / Process Training,/ 5M(s) Enablers for Motivation and Team Compensation to match the Quiality of Strategy for D2P effectiveness on a rally//race/event basis
Create an environment or experience for mission to podium finish ratings	Design an analytics channel building programme that helps create and manage mission to podium finish roles for the 5M(s) *In this brand analytics document, read customers as REN stakeholders or participants	Decide on cost accounting or mission grades for each of the REN-5M(s) accounts Recommend vehicles/products/parts/systems services for missions Provide incentives Feedback to management on experience, new or deficient areas
Build trust and relationship (motivation) for brand/vehicle and its REPI causal intelligence	Develop terms and condition for Quality of Strategy Develop D2P Brand equity policy	Honour terms and conditions for Quality of Strategy (Qo-S) Provide relevant after rally/race/event cost accounting and REPI expectations

		Rely on REPI and Qo-S Intelligence (that is implement and improve the 6 Vital ingredients) Build and use REN/REPI analytics channel building profiles for interactions, relationships and nature of participation
Increase belief in the brand's vehicles/ products/parts/systems/ services	Design and Develop D2P brand equity	Enhance D2P brand equity Exercise right push for Quality of Strategy
REN Reach based Profit Maximization D2P Maximization	Develop and improve the D2P mix for the Quality of Strategy	Enhance 5M(s) mix via REPI Vital ingredients Leadership, DPD-influencers management and D2P-effectiveness supervision of Brand and Race analytics
Brief on the 6 Vital ingredients to win business	- Sound and Relevant REN knowledge - Competitive D2P industry knowledge - Awareness of company's policy, key departments and people for REP policies - REN Accountable vehicles/ products/parts/systems/services knowledge - Analytics Channel Building skills for the reach of each mission - Positive and enthusiastic attitude to earn REN trust, relate to vehicle/product / part/system/service need with REPI and innovational D2P synergy, also address circumstantial need for DPD objectives	

Table 11: Baseline Details 4: Design a template (following tabulation) and questionnaire on how to rate REN/REPI mission results

Nature of work	Business generated
REN Vision/Mission/Engagement / Participation	**(REN Market share):** Track record for brand/vehicle/REPI mission results First contact level to Sustaining REN/REPI involvement
D2P Workflows/Lifecycles	**(D2P grade for REPI maximization):** Track record for different DPD/SP-E-P-PI foundations
REN enabled Brand development and growth	**(REN reach enabled Profits maximization):** Track record for brand/vehicle **(D2P maximization):** Track record for REPI/D2P foundations

Area 2: Growth Areas that need evaluation

Tick as applicable:

- REN mission and engagement

- Understanding of DPD/D2P needs & benefit analysis

- Responsive teamwork/management

- Analysis of Functional Safety or crash worthiness of vehicles in context of accidental repairs or incidence evaluation in a rally/race/track

- Effectively coordinating REN teamwork, PSW / Workshop interactions, D2P workflows/lifecycles/systems and processes to design growth or synergy between any existing and upcoming models

- Deploying an Analytics Channel Building programme to baseline and engineer all of the above and accentuate the brand/vehicle

Area 3: Pain points for REN departments/teams

Tick as applicable:

- Improved REN engagement for each rally/race/event

- Improved First Contact to D2P level data recording for each REN interaction

- Effectively coordinating QCDES (Quality, Cost, Delivery, Environmental friendliness and Safety Management) for REN expectations, D2P level analytics, systems and processes

- Responsive QCDES based data recording/analysis

- Basal Pain point specific Management Accounting

- Global and Mutually Beneficial for REN/D2P missions brand image and brand equity development

Area 4: Pain points for most Pit Stop Window / Workshops

Tick as applicable:

- D2P Experience dashboard (part of the consumer model)

- D2P Experience Mapping dashboard (part of the producer model)

- D2P Basal spare parts management experience (part of the producer-consumer model)

- D2P Crash worthiness and safety analysis with accidental repairs or incidence evaluation

- D2P Brand and Race Analytics Scorecard for the vehicle's brand, race and forward lifetime theory (part of the sense and respond dynamics)

The D2P Dashboard can be designed using the DPD/SP-E-P-PI Engagement Cycle scorecard with separate panes for

(1) Satisfied/Unsatisfied D2P report for the vehicle model/variant

(2) Single instance/Multiple instance D2P problems with vehicle

(3) Positive/Negative D2P feedback for the vehicle model/variant

The D2P Dashboard implementation often uses a D2P Dataset (or engineers D2P results from third party case studies/datasets) and designs D2P Reports using the Business Analytics Tools called Tableau. Power BI.

The D2P Dataset can be created, edited and updated either using Microsoft Excel (first milestone) or for ease of data entry via a D2P Mission-and Experience form-based application (second milestone).

The D2P Dataset columns (FAST TRACK version for 4W/REN vehicle specifications) tabulation is as follows

Column name	Column data
Fast Track Id	Serial number or unique number for the rally/race/event
Type of REN category	New or Existing or Referral
Type of REN vehicle	4W/REN vehicle specification for the man-machine excellence expected
REN Vehicle details	Model and/or Variant
REN Nature of D2P workflow/lifecycle	Helps the Individual or Automobile SD&G Business or REN investor
REN Nature of D2P Data	Brand Analytics, Race Analytics, Financial Assistance or Fast Track Mile-stoning
REN Nature of D2P association	Individual or Automobile SD&G Business or REN Vision for Brand Investor or REN Vision for D2P Stakeholder or REPI Stakeholder for Brand/Race/D2P innovation

Satisfied D2P Vehicle Reviews	Exteriors; Interior design; Engine and performance; Fuel consumption; Petrol Tank; Clutch system; Exhaust system and Silencer; Safety; Comfort and Convenience; Seats and Upholstery; Accessories; Battery and Battery Management System; Applicable Electric Motors; <mark>Vehicle model/variant related DPD effectiveness or dynamics parameter dashboarding/panelling/analytics</mark>
Unsatisfied D2P Vehicle Reviews	Exteriors; Interior design; Engine and performance; Fuel consumption; Petrol Tank; Clutch system; Exhaust system and Silencer; Safety; Comfort and Convenience; Seats and Upholstery; Accessories; Battery and Battery Management System; Applicable Electric Motors; <mark>Vehicle model/variant related DPD effectiveness or dynamics parameter dashboarding/panelling/analytics</mark>
Problems with D2P vehicle	Refer as applicable - Engine life; Fork oil leaks; Engine oil leaks; Fuel Tank Rust; Carburettor and performance; Clutch / Clutch cable; Exhaust system and Silencer; Oil seal / Vacuum leaks / lubricants; Rubbing brakes; Brake pads/discs/cable; Jumping gears; Snapped chain; Suspension; Broken cleat / pedals; Electrical starter; Electrical spark; Battery; Tyre burst / aging; Air filter; Water splash on engine/motor; Water-resistant covers; IP rating
Multiple instances problems with D2P vehicle	Refer as applicable - Engine life; Fork oil leaks; Engine oil leaks; Fuel Tank Rust; Carburettor and performance; Clutch / Clutch cable; Exhaust system and Silencer; Oil seal / Vacuum leaks / lubricants; Rubbing brakes; Brake pads/discs/cable; Jumping gears; Snapped chain; Suspension; Broken cleat / pedals; Electrical starter; Electrical spark; Battery; Tyre burst / aging; Air filter; Water splash on engine/motor; Water-resistant covers; IP rating
Positive Feedback for D2P Vehicle	Exteriors; Interior design; Engine and performance; Fuel consumption; Petrol Tank; Clutch system; Exhaust system and Silencer; Safety; Comfort and Convenience; Seats and Upholstery; Accessories; Battery and Battery Management System; Applicable Electric Motors; <mark>Vehicle model/variant related DPD effectiveness or dynamics parameter dashboarding/panelling/analytics</mark>
Negative Feedback for D2P Vehicle	Exteriors; Interior design; Engine and performance; Fuel consumption; Petrol Tank; Clutch system; Exhaust system and Silencer; Safety; Comfort and Convenience; Seats and Upholstery; Accessories; Battery and Battery Management System; Applicable Electric Motors; <mark>Vehicle model/variant related DPD effectiveness or dynamics parameter dashboarding/panelling/analytics</mark>

==DPD effectiveness or dynamics parameter dashboarding/panelling/analytics==

Targeted audience/teamwork

- ❑ Brand development and growth Panel
- ❑ REN Panel
- ❑ Driver and Co-driver team
- ❑ PSW / Workshop team
- ❑ DPD Analytics team
- ❑ Fast Track Responsiveness team

Management Accounting and Forecasting teamwork for

- ❑ D2P Hub Membership
- ❑ Quality of information
- ❑ Quality of process
- ❑ Quality of outcome
- ❑ Quality of Strategy
- ❑ Investment for pain points

15. MANAGEMENT ACCOUNTING AND FORECASTING
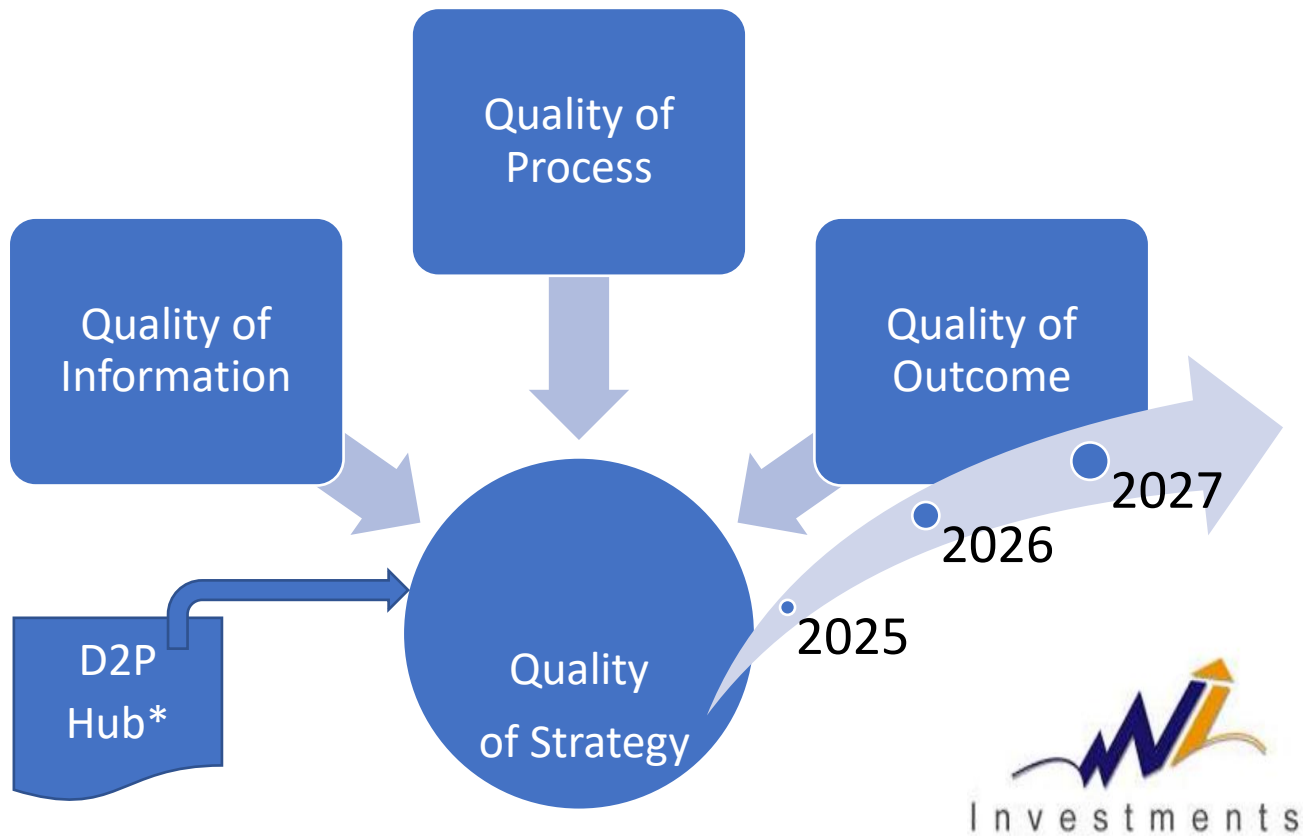
Investments for most rallies/races/events

They mainly involve investments for

1. The Manufacturing for the DPD/D2P KPI(s)
2. Quality assurance of information and process for the DPD/D2P KPI(s)
3. Quality assurance of strategy for the DPD/D2P KPI(s)
4. Quality of outcome for the DPD/D2P KPI(s)
5. Electronic data management/ value adding data sets/data analytics channel building with Proven granularity and authentication based practices
6. Investments as a brand for the DPD/D2P KPI(s)

Investments for a Manufacturer

REN
REPI
Strategic Planning-Engagement-Participation-Process Improvement / Event Relationship Management
REN teams/Driver & Co-driver teams/PSW/Workshop teams, DPD Analytics teams, Track level assisting staff, HRM
REN and REPI Finance, Accounting and Billing
REN Spares/Parts/Inventory management
REN IT / Analytics channel Building
REN Legal compliance
REN Front-office
REN Back-office/Engineering
REN Market research / investor research/skill development

Investments for Quality assurance of information/process

REN sense and respond interactions
REPI sense and respond interactions
REPI Brand sense & respond interactions and advisors
REPI HRM sense & respond interactions
REPI Finance, Accounting and Billing
REPI Spares/ Parts/Inventory and Related Stock management
REPI IT / Analytics channel building
REPI Legal compliance
REPI/D2P/DPD Assistants (data analytics forms/case study teams)
D2P PSW/Workshop
Strategic Promotion, Forecasting and Events management

Investments for Quality assurance of strategy

D2P PSW / Workshop
D2P Accentuators/Tools and technology
D2P Strategic Planning-Engagement-Participation-Process Improvement / Real time Operations Management
REN teams/Driver & Co-driver teams/PSW/Workshop teams, DPD Analytics teams, Track level assisting staff, HRM
D2P Workflow/Lifecycle/Analytics Management / Advisories / Standardization
D2P Adhoc services / Breakdown Assistance / Accidental Repairs
D2P Accounting, and Cash flow management
PSW/Workshop/Real time need based Stock and spares management
D2P IT/Analytics channel building

D2P Legal compliance for interests like Environmental/Safety/Sustainable event management
D2P Real time interaction teams
D2P REN Back-office/Engineering/REPI/teams
D2P Feedback and Surveys
D2P Complaints and Redressal

Investments for Quality of outcome

D2P Experience Dashboard and D2P Experience Mapping Dashboard (Custom made, Tableau)
Key Performance Indicators
Satisfiers/ Dissatisfiers Evaluation
Feedback and Surveys
Complaints and Redressal
Management Intervention
REN/REPI level escalation

Investments for Electronic data management/value adding data sets/analytics channel building with Proven granularity and authentication based practices

REN, REPI and D2P software/forms
D2P PSW/Workshop software/forms
REN, REPI and D2P Accounting software/forms
REN, REPI and D2P Stock management software/forms
HRM software/forms for REN team management/Driver & Co-drive team management/PSW & Workshop team management/DPD analytics team management
REN, REPI and D2P Performance Appraisal and Training software/forms
REN, REPI and D2P Strategic planning-Engagement-Participation-Process improvement software/teams
REN, REPI and D2P Quality of outcome software/forms
REN, REPI and D2P Management Information / Accentuator Reports software/forms
REN, REPI and D2P Documentation and Workflow management software/forms

Investments as a brand for D2P/DPD efffectiveness

REN Reach based Profit Maximization and D2P Maximization
Promotion and Brand Equity development
Management Accounting and Forecasting
Inventory turnover and Stock keeping
Strategic Learning, Training and Skills Development
Global and Mutually Beneficial Assurance and Partnerships
Key Opinion Leadership for growth areas and pain points
Porter's 5 forces and SWOT Analysis

<mark>Where costs accrue for</mark> most rallies/races/events

Total costs for the REN event = Costs (REN Engineering/REN Head Office/REN Office for PSW & Workshop) + Costs (D2P/REPI/REN Operations) + Costs (D2P/REPI/REN Manpower) + Costs (D2P/REPI/REN Processes) + Costs (D2P/REPI/REN Measures and Metrics) + Costs (D2P/REPI/REN Tools and Technology) + Cost (D2P/REPI/REN Administration) + /Costs (D2P/REPI/REN Inventory) + Costs (D2P/REPI/REN Stock and Spares) + Costs (D2P/REPI/REN CRM)

(Table 15.A) The Main Profile Elements of Cost Control for the REN Head office are

Costs (HO)
Costs (Operations)
Costs (Manpower)
Costs (Processes)
Costs (Measures and Metrics)
Costs (Tools and Technology)
Cost (Administration)
Costs (Inventory)
Costs (CRM)

Table 15.B - The Main Profile Elements of Cost Control for the PSW and Workshop Office are

Costs (PSW Workshop)
Costs (PSW Operations)
Costs (PSW Manpower)
Costs (PSW Processes)
Costs (PSW Measures and Metrics)
Costs (PSW Tools and Technology)
Cost (PSW Administration)
Costs (PSW Inventory)
Costs PSW (Spares)
Costs (PSW REN/REPI/D2P CRM)

Table 15.C - The Main Profile Elements of Cost Control for the REN reach office for brand/race analytics channel development and implementation are

Costs (REN reach supporting office/REPI office)
Costs (REN reach/REPI Operations)
Costs (REN reach/REPI Manpower)
Costs (REN reach/REPI Processes)
Costs (REN reach/REPI Measures and Metrics)
Costs (REN reach/REPI Tools and Technology)
Cost (REN reach/REPI Administration)
Costs (REN reach/REPI Inventory)
Costs (REN reach/REPI Stock and Spares)
Costs (REN reach/REPI CRM)

D2P at Event Stores, Stock and Spares Management (To be reviewed as per practices)

1. D2P at Event Stores and item classifications:

D2P Finished Goods
D2P PSW/Workshop Consumables
D2P PSW/Workshop Machinery and Equipment
D2P PSW/Workshop Hand tools
D2P PSW/Workshop Scrap
D2P Front office/Back office /REPI Engineering Office Consumables
D2P Reserves

2. D2P at Event Stores and recording:

Stores ledger
Codification system
Inward or Outward register
Stock register
Issue register
Surplus register
Empty containers and packaging register
Rejects or Faulty register

3. D2P at Event Inventory models and techniques:

D2P at Event Standardized Quantity Model
Safety Stock or Buffer Stock
Continuous Inventory System
ABC (Activity based costing) Analysis

4. D2P at Event Inventory management concepts:

D2P at Event Standardized Demand forecasting
Order cycle
Lead time
Safety stock
D2P/DPD Effectiveness based Inventory turnover
D2P/DPD Effectiveness based Re-order level (Danger/Reserve, Maximum and Minimum inventory levels)
D2P/DPD Effectiveness based Re-order quantity

4.2   Inventory Costs:

D2P at Event Standardized Ordering cost
Capital cost
Inventory carrying costs
Shortage costs (like extra urgency costs, loss of standardized benefits in effect)

4.3 D2P at Event Ordering cost

Related Inventory Logistics cost
Ex-situ Inventory Ordering cost
Ex-situ Inventory Supply/Purchase cost
Related Inventory Inspection costs
Related Inventory Accounting

4.4 D2P at Event Inventory carrying costs

Storage
Handling
Event Afflicted condition, Depreciation, tax, insurance
Record keeping
Deterioration and obsolescence
Spoilage, Leakage
Pilferage
Other Internal Costs

D2P at Event Warehouse Management (To be reviewed as per practices)

1. Warehouse and product classifications (WIP):

Inwards vehicles
Inspected vehicles
Rejected vehicles
Track utilization vehicles
Reserved vehicles (for PSW/Workshop resort/replacement)
Insurance cover and REN/REPI/S2P paperwork for vehicles

2. Warehouse and recording (WIP):

Warehouse ledger
Inward or Outward register
Stock register
Issue register
Reserved register
Empty containers and packaging register
Rejects or Faulty register

Warehouse Management Processes:

Receiving
Put away
Storage
Picking
Accessory Fitting
Packing & Shipping/Delivery

3. Inventory models and techniques (WIP):

D2P at Event Standardized Quantity Model

4. Inventory management concepts (WIP):

Order forecasting or fulfilment
Order cycle
Lead time
Safety stock
Inventory turnover
Rate of product replacement
Receiving efficiency or productivity

4.2   Inventory Costs (WIP):

Ordering cost
Capital cost
Inventory carrying costs
Shortage costs (like extra urgency costs, loss of standardized benefits or fulfilment effect)

4.3 Ordering cost (WIP):

Related Inventory Carrying cost
Related Inventory Logistics cost
Ex-situ Inventory Ordering cost
Ex-situ Inventory Supply/Purchase cost
Related Inventory Inspection costs
Related Inventory Accounting

4.4 Inventory carrying costs (WIP):

Storage
Handling
Event afflicted condition, Depreciation, tax, insurance
Record keeping
Deterioration
Spoilage, Leakage
Pilferage

D2P / DPD Effectiveness and Capital structure & cash flow

D2P Effectiveness Capital Funds
DPD Effectiveness Capital Funds
DPD /D2P Effectiveness Partner's/Board's Stake holding Funds
Rally/Race/Event Policy Short term Cash funds
Rally/Race/Event Policy Short term Deposits
Rally/Race/Event interests in **D2P / DPD Effectiveness ratios**
Dollar/Euro/ Currency Exchange-facility
Currency Exchange difference-accruals
Business Development and Growth Short term Securities

Table 15: D2P / DPD Effectiveness ratios for geo-coded management accounting

Stating whether the health of these financial ratios is Good, Unsatisfactory or Not Applicable helps plan ahead, or develop business vision and operating policies.

Ratio	Health	Formulae
D2P/DPD Effectiveness (ROIC)		Return on geo-coded invested capital = Net geo-coded profit / geo-coded invested capital
D2P/DPD Effectiveness (ROA)		Return on total geo-coded assets = Net geo-coded profit / Total geo-coded assets
D2P/DPD Effectiveness Liquidity Ratio (Current Ratio)		geo-coded Current Ratio = Current geo-coded assets / Current geo-coded liabilities
D2P/DPD Effectiveness Liquidity Ratio (Quick Ratio)		geo-coded Quick Ratio = Current geo-coded assets – geo-coded inventory / Current geo-coded liabilities
D2P/DPD Effectiveness Activity Ratios (Inventory Turnover)		geo-coded Inventory turnover = Cost of geo-coded goods invested / geo-coded inventory
D2P/DPD Effectiveness Activity Ratios (Rally/Race/Event Day's outstanding)		geo-coded EDO = geo-coded Accounts receivable / (geo-coded Total invested/ geo-coded Event duration or geo-coded interrelated intervals

D2P/DPD Effectiveness Leverage Ratios (Debt to Assets ratio)		geo-coded Debt to Assets ratio = Total geo-coded debts / Total geo-coded Assets
D2P/DPD Effectiveness Cash flow position		Geo-coded Budgeting effectiveness

D2P Value addition and Health of Balance Sheets

Geo-coded Capital (D2P Effectiveness and DPD Effectiveness)
Geo-coded Assets
Geo-coded Liabilities
Geo-coded Currency Exchange difference-accruals
Geo-coded Expenses
Geo-coded Profits and Margin of profits
Geo-coded Budgeting and Cash flow
Geo-coded Contingency funds/Reserves
Geo-coded Debts, Out-standings, Bad debts
Geo-coded Overrun expenses
Geo-coded Legal claims

What is Geo-coded budgeting?

It is a financial plan for D2P value addition for a defined period of time, usually a rally/race/event, where the plan includes

- ☐ Approximate costs during a period   (Tick if applicable)
- ☐ Approximate revenues during a period   (Tick if applicable)
- ☐ Future financial conditions   (Tick if applicable)
- ☐ Planned promotion and sales   (Tick if applicable)
- ☐ Resource estimations   (Tick if applicable)
- ☐ Costs and expenses   (Tick if applicable)
- ☐ Assets   (Tick if applicable)
- ☐ Liabilities   (Tick if applicable)
- ☐ Cash flow   (Tick if applicable)

How is a Geo-coded budget used?

It is used for analysing & interpreting geo-coded calculations and for comparing them to make geo-coded decisions.

How does a Geo-coded budget help?

It is essential for managing, spending, avoiding delays/debts, and for properly allocating resources for geo-coded rally/race/event investments. It may include a geo-coded budget surplus.

How does a geo-coded budget influence D2P/DPD analytics managers?

(a) It enables and controls managers to consider how the geo-coded event, rally/race/track experience and conditions may matter and then helps decide what steps should be taken.

(b) It helps managers compare and consolidate problems before they occur

(c) It helps coordinate the activities of the REN / REPI / D2P teams by enabling managers to examine relationships between a specific geo-coded department's/team's functions and those of other departments/teams

(d) It helps control geo-coded resources

(e) It helps communicate geo-coded plans to specific departments/teams/managers via a geo-coded D2P Accentuator framework

(f) It helps motivate managers to strive to achieve geo-coded budget/D2P accentuated goals

(g) It helps managers perform visibly and accountably for the geo-coded event, rally/race/track

Remarks:

What are the objectives of a geo-coded budget?

A budget provides a basis for

(a) Examining the achievements of a business with respect to the industry, market and forecasts

(b) Checking and approving the various expenditures of different departments

(c) Evaluating managerial policies from time to time

(d) Developing programmes for systems development, process development and service operations development

(e) Deciding the basis, estimates and baseline for expenditures from funds allocated for a period

(f) Knowing & assessing the efficiency and economical hindsight of the business

Remarks:

For the organization, the steps to prepare a budget may need some finalization to achieve the business vision, mission and costs management expected

What are the steps to preparing a budget?

Step 1: Formation of a budget committee and costs centre framework

Step 2: Creation of standard budget forms that include estimations of funds, income, expenses, where the forms will need to be approved or revised by all associated departments

Step 3: Drafting and submission of reports from the accounts departments (for the past 2 years) showing the comparison between costs of service operations, income and expenses

Step 4: Preparation and submission of a forecast by each department

Step 5: Analysis of business and market conditions with forecasted, past and present data

Step 6: Formalization of departmental budgets by the budget officer and sharing of these budgets with departments for their strategic approval or revision

Step 7: Preparation of service operations plans and policies using reports submitted by the various departments

Step 8: Revision and correction of service operations plans and policies by the budget committee in consultation with finance and other departments

Remarks:

Proposal for a Cost Centre framework

The Cost Centre is a framework that helps a company or budget committee create categories and sub-categories of budgets to suit the nature of business.

The proposal is to use a Cost Centre framework to create different categories of budgets:

(1) According to time (Tick as applicable today)

☐ Long-term
☐ Short-term
☐ Current
☐ Rolling

Remarks:

(2) According to function (Tick as applicable today)

☐ Sales budget
☐ Marketing budget
☐ Production budget
☐ Spares Purchases budget
☐ Consumables Purchases budget
☐ Showroom Expenses budget
☐ Workshop Expenses budget
☐ Warehouse Expenses budget
☐ Cost of operations budget
☐ Capital expenditure budget
☐ Cash budget
☐ Revenue budget
☐ Performance budget
☐ Project budget
☐ Master budgets

Remarks:

(3) According to flexibility (Tick as applicable today)

☐ Fixed budgets
☐ Flexible budgets

Remarks:

Sales Budget for 2W

Company: **Department:**

Year: **Quarter: Q1/Q2/Q3/Q4**

Type of vehicle: **City:**

Area in City	Product	Variant	Price in INR	Units for the month	Value for the month in INR	Units for the Quarter	Value for the Quarter in INR
North							
South							
East							
West							
Other Areas							
Total							

Remarks:

Sales Budget for 4W

Company: **Department:**

Year: **Quarter: Q1/Q2/Q3/Q4**

Type of vehicle: **City:**

Area in City	Product	Variant	Price in INR	Units for the month	Value for the month in INR	Units for the Quarter	Value for the Quarter in INR
North							
South							
East							
West							
Other Areas							
Total							

Remarks:

Sales Budget for EV/Hybrid

Company: **Department:**

Year: **Quarter: Q1/Q2/Q3/Q4**

Type of vehicle: **City:**

Area in City	Product	Variant	Price in INR	Units for the month	Value for the month in INR	Units for the Quarter	Value for the Quarter in INR
North							
South							
East							
West							
Other Areas							
Total							

Remarks:

Marketing Budget for 2W

Company: **Department:**

Year: **Quarter: Q1/Q2/Q3/Q4**

Type of vehicle: **City:**

Marketing costs include (Tick as applicable):

Advertising(Press)/ Advertising(Cinema)/ Advertising(TV)/ Advertising(Others)/Sales Promotion/Postage and Stationery Expenses/Commission

Area in City	Product	Variant	(M) Marketing costs for the month in INR	(S) Sales budget for the month in INR	(S)-(M) for the month in INR	(M) Marketing costs for the quarter in INR	(S) Sales budget for the quarter in INR	(S)-(M) for the quarter in INR
North								
South								
East								
West								
Other Areas								
Total								

Remarks:

Marketing Budget for 4W

Company: **Department:**

Year: **Quarter: Q1/Q2/Q3/Q4**

Type of vehicle: **City:**

Marketing costs include (Tick as applicable):

Advertising(Press)/ Advertising(Cinema)/ Advertising(TV)/ Advertising(Others)/Sales Promotion/Postage and Stationery Expenses/Commission

Area in City	Product	Variant	(M) Marketing costs for the month in INR	(S) Sales budget for the month in INR	(S)-(M) for the month in INR	(M) Marketing costs for the quarter in INR	(S) Sales budget for the quarter in INR	(S)-(M) for the quarter in INR
North								
South								
East								
West								
Other Areas								
Total								

Remarks:

Marketing Budget for EV/Hybrid

Company: **Department:**

Year: **Quarter: Q1/Q2/Q3/Q4**

Type of vehicle: **City:**

Marketing costs include (Tick as applicable):

Advertising(Press)/ Advertising(Cinema)/ Advertising(TV)/ Advertising(Others)/Sales Promotion/Postage and Stationery Expenses/Commission

Area in City	Product	Variant	(M) Marketing costs for the month in INR	(S) Sales budget for the month in INR	(S)-(M) for the month in INR	(M) Marketing costs for the quarter in INR	(S) Sales budget for the quarter in INR	(S)-(M) for the quarter in INR
North								
South								
East								
West								
Other Areas								
Total								

Remarks:

Production/Dealer Budget for 2W

Company: **Department:**

Year:

Type of vehicle:

Model: **Variant:**

Sl No	Details	Q1	Q2	Q3	Q4	Total
	Sales demand (units)					
1	**Opening Stock**					
2	**70% of current quarter's demand**					
3	**30% of next quarter's demand**					
4	**Total Production/Stock (1 and 2)**					
5	**Opening Stock (1+4 – Sales)**					

Remarks:

Production/Dealer Budget for 4W

Company: **Department:**

Year:

Type of vehicle:

Model: **Variant:**

Sl No	Details	Q1	Q2	Q3	Q4	Total
	Sales demand (units)					
1	**Opening Stock**					
2	**70% of current quarter's demand**					
3	**30% of next quarter's demand**					
4	**Total Production/Stock (1 and 2)**					
5	**Opening Stock (1+4 – Sales)**					

Remarks:

Production/Dealer Budget for EV/Hybrid

Company: **Department:**

Year:

Type of vehicle:

Model: **Variant:**

Sl No	Details	Q1	Q2	Q3	Q4	Total
	Sales demand (units)					
1	**Opening Stock**					
2	**70% of current quarter's demand**					
3	**30% of next quarter's demand**					
4	**Total Production/Stock (1 and 2)**					
5	**Opening Stock (1+4 – Sales)**					

Remarks:

Spares Budget for 2W

Company: **Department:**

Year: **Quarter: Q1/Q2/Q3/Q4**

Type of vehicle:

Model: **Variant:**

Sl No	Details	Part1	Part2	Part3	Part4	…	Total
	Spares demand (units sales)						
1	**Opening Stock**						
2	**70% of current quarter's demand**						
3	**30% of next quarter's demand**						
4	**Total Spares (1 + 2)**						
5	**Total Spares (*) (1 + 2 + 3)**						
6	**Opening Stock (1+4 – Sales)**						
7	**Opening Stock (*) (1+5 – Sales)**						

Remarks:

Spares Budget for 4W

Company: **Department:**

Year: **Quarter: Q1/Q2/Q3/Q4**

Type of vehicle:

Model: **Variant:**

Sl No	Details	Part1	Part2	Part3	Part4	…	Total
	Spares demand (units sales)						
1	**Opening Stock**						
2	**70% of current quarter's demand**						
3	**30% of next quarter's demand**						
4	**Total Spares (1 + 2)**						
5	**Total Spares (*) (1 + 2 + 3)**						
6	**Opening Stock (1+4 – Sales)**						
7	**Opening Stock (*) (1+5 – Sales)**						

Remarks:

Spares Budget for EV/Hybrid

Company: **Department:**

Year: **Quarter: Q1/Q2/Q3/Q4**

Type of vehicle:

Model: **Variant:**

Sl No	Details	Part1	Part2	Part3	Part4	…	Total
	Spares demand (units sales)						
1	**Opening Stock**						
2	**70% of current quarter's demand**						
3	**30% of next quarter's demand**						
4	**Total Spares (1 + 2)**						
5	**Total Spares (*) (1 + 2 + 3)**						
6	**Opening Stock (1+4 – Sales)**						
7	**Opening Stock (*) (1+5 – Sales)**						

Remarks:

Spares Purchase Budget for 2W

Company: **Department:**

Year:

Type of vehicle:

Model: **Variant:**

Spare part:

Quarter	Units Planned	Add closing stock	Less opening stock	Purchases	Price per unit	Added cost per unit	Total cost
Q1							
Q2							
Q3							
Q4							
Total							

Remarks:

Consumables Purchase Budget for 2W

Company: **Department:**

Year:

Type of vehicle:

Model: **Variant:**

Consumable:

Quarter	Consumption Planned	Add closing stock	Less opening stock	Purchases	Price per kg/litre	Added cost per kg/litre	Total cost
Q1							
Q2							
Q3							
Q4							
Total							

Remarks:

Spares Purchase Budget for 4W

Company: **Department:**

Year:

Type of vehicle:

Model: **Variant:**

Spare part:

Quarter	Units Planned	Add closing stock	Less opening stock	Purchases	Price per unit	Added cost per unit	Total cost
Q1							
Q2							
Q3							
Q4							
Total							

Remarks:

Consumables Purchase Budget for 4W

Company: **Department:**

Year:

Type of vehicle:

Model: **Variant:**

Consumable:

Quarter	Consumption Planned	Add closing stock	Less opening stock	Purchases	Price per kg/litre	Added cost per kg/litre	Total cost
Q1							
Q2							
Q3							
Q4							
Total							

Remarks:

Spares Purchase Budget for EV/Hybrid

Company: **Department:**

Year:

Type of vehicle:

Model: **Variant:**

Spare part:

Quarter	Units Planned	Add closing stock	Less opening stock	Purchases	Price per unit	Added cost per unit	Total cost
Q1							
Q2							
Q3							
Q4							
Total							

Remarks:

Consumables Purchase Budget for EV/Hybrid

Company: **Department:**

Year:

Type of vehicle:

Model: **Variant:**

Consumable:

Quarter	Consumption Planned	Add closing stock	Less opening stock	Purchases	Price per kg/litre	Added cost per kg/litre	Total cost
Q1							
Q2							
Q3							
Q4							
Total							

Remarks:

Showroom Expenses Budget

Company: **Department:**

Year: **Quarter: Q1/Q2/Q3/Q4**

Type of showroom:

City: **Area:**

Items	50% capacity	60% capacity	75% capacity	90% capacity	100% capacity
Variable expenses					
Indirect Materials					
Indirect Labor					
Indirect overheads					
Semi-variable expenses					
Rent					
Electricity					
Sales and Distribution					
Value addition					
Administration					
House keeping					
Stationery					
Postage/Couriers					
Repairs and Maintenance					
Fixed expenses					
Interest					
Depreciation					
Insurance					
Salaries					
Additional expenses					

Remarks:

Workshop Expenses Budget

Company: **Department:**

Year: **Quarter: Q1/Q2/Q3/Q4**

Type of workshop:

City: **Area:**

Items	50% capacity	60% capacity	75% capacity	90% capacity	100% capacity
Variable expenses					
Indirect Materials					
Indirect Labor					
Indirect overheads					
Semi-variable expenses					
Rent					
Electricity					
R&D					
Value addition					
Administration					
House keeping					
Stationery					
Postage/Couriers					
Repairs and Maintenance					
Fixed expenses					
Interest					
Depreciation					
Insurance					
Salaries					
Additional expenses					

Remarks:

Warehouse Expenses Budget

Company: **Department:**

Year: **Quarter: Q1/Q2/Q3/Q4**

Type of warehouse:

City: **Area:**

Items	50% capacity	60% capacity	75% capacity	90% capacity	100% capacity
Variable expenses					
Indirect Materials					
Indirect Labor					
Indirect overheads					
Semi-variable expenses					
Rent					
Electricity					
Value addition					
Administration					
House keeping					
Stationery					
Postage/Couriers					
Repairs and Maintenance					
Fixed expenses					
Interest					
Depreciation					
Insurance					
Salaries					
Additional expenses					

Remarks:

Cost of operations budget

Company: **Department:**

Year: **Quarter: Q1/Q2/Q3/Q4**

Type of operations: Showroom/Workshop/Warehouse

City: **Area:**

Items	50% capacity	60% capacity	75% capacity	90% capacity	100% capacity
Budgets					
Materials					
Labor					
Administration					
Overheads					
Additional expenses					

Remarks:

Capital Expenditure budget

Company: **Department:**

Year: **Quarter: Q1/Q2/Q3/Q4**

Type of operations: Showroom/Workshop/Warehouse

City: **Area:**

Items	Budgeted Amount	Additional Expenses	Total
Factors			
Purchase of New Assets for Sustainable Development and Growth			
Replacement of existing Assets			
Purchase of Additional Assets for increased business volume			
Purchase of Additional Assets for new areas of business			
Installation of Machinery/Equipment/Facilities to reduce cost of operations			

Remarks:

Cash budget

Company: Department:

Year: Quarter: Q1/Q2/Q3/Q4

Type of operations: Showroom/Workshop

City: Area:

Sl No	Items	Month 1	Month 2	Month 3
1	**Opening cash balance**			
2	Cash from sales			
3	Cash collection from credit sales			
4	Cash from services			
5	Total Cash inflow from sales (2) + (3)			
6	Total Cash inflow from services (4)			
(I)	**Total Cash inflow (5) + (6)**			
7	**Payment to creditors**			
8	For Purchases			
9	For Services			
10	Total Payment to Creditors (8) + (9)			
11	Payment of Salaries and Wages			
12	Payment of Interest			
13	Payment of Taxes			
14	Instalment for Machinery/Equipment/Facilities			
15	Administration expenses			
(II)	**Total Cash Outflow**			
(III)	**Opening Cash Balance (I) – (II)**			

Remarks:

Master budget (Sales)

Company: **Department:**

Year:

Type of products: **2W/4W/Electric Vehicles/Hybrid**

City: **Area:**

Sl No	Item	Scooters		Motorbikes		Electric Vehicles		Total	
		Current Year	Prev Year	Current Year	Prev Year	Current Year	Prev Year	Current Year	Prev Year
(1)	**Sales**								
Less	**Cost of sales**								
(2)	**Gross Profit**								
Less	**Operating Expenses**								
Less	**Admin Expenses**								
Less	**Selling and Distribution**								
Less	**R & D**								
Less	**Value addition**								
Less	**General expenses**								
(3)	**Operating Profit**								
Add	**Other income**								
(4)	**NPBT**								
Less	**Provision for Tax**								
(5)	**Net Profit**								
Less	**Appropriations**								
Less	**Debts**								
(6)	**Balance of profit**								
(7)	**Assets (Fixed)**								
(8)	**Assets (Current)**								
(9)	**Total Capital Employed**								
(10)	**Liabilities (Long term)**								
(11)	**Liabilities (Current)**								

(12)	**Strategic Funding**								
Ratios	**Profit/ Turnover**								
Ratios	**Profit/ Capital Employed**								
Ratios	**Sales/ Capital Employed**								
Current Ratio	**Current Assets/ Current Liabilities**								
Liquid Ratio	**(Current assets – inventory) / Current Liabilities**								
Activity Ratios	**Inventory turnover = Cost of goods sold / inventory**								
Leverage Ratio	**Debt to Assets ratio = Total debts / Total Asset**								

Review of Management Accounting (as currently implemented)

1. For Forecasting and Planning (Yes/No/NA)

2. For Organizing (Yes/No/NA)

3. For Coordinating (Yes/No/NA)

4. For Controlling performance (Yes/No/NA)

5. For Financial analysis and interpretation (Yes/No/NA)

6. For Communication (Yes/No/NA)

7. For Special studies (Yes/No/NA)

8. For Protection of Business Assets (Yes/No/NA)

9. For Tax policies (Yes/No/NA)

Review of Tools and Techniques used in Management Accounting

1. Financial planning (Yes/No/NA)

2. Analysis of financial statements (Yes/No/NA)

3. Historical cost accounting (Yes/No/NA)

4. Standard costing (Yes/No/NA)

5. Budgetary control (Yes/No/NA)

6. Marginal costing (Yes/No/NA)

7. Funds flow statement (Yes/No/NA)

8. Cash flow statement (Yes/No/NA)

9. Decision making (Yes/No/NA)

10. Revaluation accounting (Yes/No/NA)

11. Statistical and Graphical Techniques (Sales and Earnings (Yes/No/NA), Investment (Yes/No/NA))

12. Reporting (Yes/No/NA)

Common concerns in current implementation

1. Incorporation of Cost ratios and issues

2. Sales Variance issues and Choice of methodologies

Incorporation of Cost ratios and issues

1. Unquantifiable Costs or ratios (Yes/No/NA)

2. Lack of objectivity (Yes/No/NA)

3. Lack of continuity and coordination (Yes/No/NA)

4. Psychological resistance (Yes/No/NA)

5. Need for future- ready organizational vision .... with

a. Clear objectives (Yes/No/NA)

b. Maximizing profits with right performance culture (Yes/No/NA)

c. Vigilance (Yes/No/NA)

d. Coordination and adherence to Standard costing guidelines (Yes/No/NA)

Variance in business (as current issues)

1. Product price Variance (Yes/No/NA)

2. Material (or Spares) Price Variance (Yes/No/NA)

3. Material (or Spares) Usage variance (Yes/No/NA)

4. Rate of Pay Variance (Yes/No/NA)

5. Expenditure Variance (Yes/No/NA)

6. Labor Efficiency Variance (Yes/No/NA)

7. Idle Time Variance (Yes/No/NA)

8. Sales or Business Volume Variance (Yes/No/NA)

9. Sales Price Variance (Yes/No/NA)

10. Sales Volume Variance (Yes/No/NA)

Sales Variance issues and selecting of methodologies

1. Profit method

2. Value method

Analysing Sales Variance using the Profit method

1. Use of Total Sales Margin Variance (TSMV) (Yes/No/NA)

2. Use of Sales Margin Variance (SMV) by nature of

a. SMV due to Selling Price (Yes/No/NA)

b. SMV due to Volume (Yes/No/NA)

c. SMV due to Sales Mixture (Yes/No/NA)

d. SMV due to Sales Quantities (Yes/No/NA)

e. SMV due to Calendar variance (Yes/No/NA)

Analysing Sales Variance using the Value method

1. Use of Sales Value Variance (Yes/No/NA)

2. Use of Sales Price Variance (Yes/No/NA)

3. Use of Sales Volume Variance (Yes/No/NA)

4. Use of Sales Mix Variance (Yes/No/NA)

5. Use of Sales Quantity Variance (Yes/No/NA)

6. Use of Sales Volume Variance due to Efficiency (Yes/No/NA)

Use of Fundamental Cost Ratios

(Level 1)
1. Working costs/ Net Sales (Yes/No/NA)

2. Distribution overheads / Net Sales (Yes/No/NA)

3. Marketing overheads / Net Sales (Yes/No/NA)

4. Direct Material costs / Working costs (Yes/No/NA)

5. Direct Labor costs / Working costs (Yes/No/NA)

(Level 2)

1. Prime costs / Net Sales

2. Departmental overheads / Net Sales

3. General overheads/ Net Sales

4. Admin overheads / Net Sales

5. Cost of (Workshop) Facility Maintenance / Working Costs

6. Cost of Maintenance of other (Workshop) Facility Assets / Working costs

7. Cost of spares used / (Man hours / Facility hours)

8. Cost of rejected spares / Working costs

9. Loss in process / Cost of spares

19. Cost of scrap / Cost of spares used

11. Power units consumed/ Facility hours

12. Cost of repeat servicing / Working costs

13. Workshop Idle Time Hours / Total Available Workshop Time

14. Cost of Workshop Idle Time / Direct Workshop Labor Costs

15. Number of vehicles serviced / (Man hours / Facility hours)

Revisiting The organization Sales Policy to ensure coverage in Cost Ratios

The company chooses to hold special offer sales of its vehicle stock on the basis of clearance sales, or discounted sales, or added overheads.

Insights to convert Workshop Idle time and improve Workshop productivity

1. R & D or empirical study for the TGMB Analysis/policy

2. Vehicle monitoring and maintenance systems

3. Optimization of maintenance schedules for Brand density and / or Fleet maintenance

4. Objective analysis to improve Remote Linkup to vehicle servicing and its intrinsic Workshop experience

Calculations for Sales Variance using the Profit method

1. Total Sales Margin Variance (TSMV) = (Actual quantity of sales X Actual profit per unit) - (Budgeted quantity of sales X Budgeted profit per unit)

2. Sales Margin Variance (SMV) by nature of

a. SMV due to Selling Price (SP) = Actual quantity of sales X (Actual SP per unit - Standard SP per unit)

b. SMV due to Volume = Standard profit per unit X (Actual quantity of sales - Budgeted quantity of sales)

c. SMV due to Sales Mixture = Standard price per unit X (Actual quantity of sales - Standard proportion for actual sales)

d. SMV due to Sales Quantities = Standard profit per unit X (Standard proportion for actual sales - Budgeted quantity of sales)

e. SMV due to Calendar variance = Actual quantity of sales / l (Actual working days - Budgeted working days) l

Calculations for Sales Variance using the Value method

1. Sales Value Variance = Actual value of sales - Budgeted value of sales

2. Sales Price Variance = Actual quantity sold X (Actual price - Standard price)

3. Sales Volume Variance = Standard price X (Actual quantity of sales - Budgeted quantity of sales)

4. Sales Mix Variance = Standard value of Actual mix - Standard value of Revised standard mix

5. Sales Quantity Variance = Revised standard Sales quantity - Budgeted Sales quantity

6. Sales Variance due to Efficiency = (Standard price + Standard fixed overhead) - (Actual quantity of sales - Budgeted quantity of sales)

Using Cost Volume Profit (CVP) Analysis

Objectives for THE ORGANIZATION
1. Helps forecast profits (Yes/No/NA)

2. Helps setup a flexible budget (Yes/No/NA)

3. Helps evaluate performance (Yes/No/NA)

4. Helps in establishing profit/price/performance policies (Yes/No/NA)

5. Helps know overhead costs (Yes/No/NA)

6. Helps decision making (Yes/No/NA)

Elements of CVP used by THE ORGANIZATION

1. Marginal Cost Equation (Yes/No/NA)
Formulae:
a. $S-V=F+/-P$
+P: PROFIT
-P: LOSS

b. $S-V=C$
$C=F+/-P$

c. For Profit
$C>F$
d. To avoid loss $C=F$

2. Contribution Margin (Yes/No/NA)
Formulae:
a. $C=SP$ - Marginal cost
b. $C=F+/-P$
c. $C=Sales \times PV\ Ratio$

3. PV Ratio or P/V Ratio or C/S Ratio (Yes/No/NA)
Formulae:
a. $P = S - TC$
$TC= F + V$

b. $P=C-F$

c. $P=$ Margin of safety $\times$ PV Ratio

d. PV Ratio $= (C/S) \times 100$

e. PV Ratio $= ((F+P)/S) \times 100$

f. PV Ratio $= (F/Break\ even\ units\ sales) \times (100/SP)$

g. PV Ratio = (P/Margin of safety) x 100

h. PV Ratio = ((S-V)/S) x 100

i. PV Ratio = (P/Margin of safety) x (100/SP)

j. PV Ratio = (Change in profit or contribution/Change in sales) x 100

k. Break even point (BEP) = F / PV Ratio

l. Expected Sales = (F + desired Profit)/PV Ratio

m. V = S (1 - PV Ratio)

n. P = (Sx PV Ratio) - F

o. F = (SxPV Ratio) - P

p. Margin of safety= P/PV Ratio

4. Break even point (calculated either in units or as a value)

Calculations for desired Profit (Yes/No/NA)

1. Sales to earn a profit = (F+P)/PV Ratio

2. Units to be sold to earn a profit = (F+P)/(S-Marginal cost)

3. Units to be sold to earn a profit = (F+P)/C

4. Expected sales volume = (F - L)/ PV Ratio

It is expected that for all product sales calculations, composite BEP is relevant for the organization as a dealership for 2W/4W/EV

Composite BEP calculations for 2 products X and Y (Yes/No/NA)

Cx: Contribution per unit of product X

nx: Number of units of product X

Cy: Contribution per unit of product Y

ny: number of units of product Y

Composite BEP = ((Cx X nx) + (Cy X ny))/(nx+ny)

Use of BEP by THE ORGANIZATION

a. BEP gives information about no profit no loss (Yes/No/NA)

b. BEP gives information about Margin of safety (Yes/No/NA)

c BEP helps calculate total profit (Yes/No/NA)

d. BEP helps decision making (Yes/No/NA)

Calculating Break even sales (Yes/No/NA)

1. Break even sales (%) = F/C x 100

2 Break even sales (%) = (Break even units to be sold / Actual units sold) x 100

3. Break even sales (%) = 100 - Margin of safety in %

Calculating Break even in units (Yes/No/NA)

1. Break even units = Total fixed expenses/ (SP-MC)

2. Break even units = Total fixed expenses/ C

3. Break even units = Actual sales in units - Margin of safety in units

4. Break even in value* = (F X S) / (S-V)

Margin of safety (M/S)

Calculations of M/S based on value

1. M/S = Actual or Present sales - Break even sales

2. M/S = Profit / PV Ratio

3. M/S = (Profit / Contribution per unit) x SP per unit

4. M/S = M/S in units X SP per unit

Calculation of M/S based on units

1. M/S in units = Profit / Contribution per unit

2. M/S in units = Actual sales in units - Break even sales in units

Calculation of M/S in %

1. M/S in % = (Profit / Contribution per unit) x 100

2. M/S in % = (M/S/ Actual sales) x 100

3. M/S in % = 100 - Break even sales in %

Contribution per unit = Purchase price - Variable costs

Break even chart

Break even charts are plotted using a tabulation of (Stock in units, Fixed expenses, Variable cost per unit, SP per unit, Total cost, Total sales) for production/ dealer stock in units

Analysis of Break even methods used by THE ORGANIZATION
Note: A: Loss Area B : Proft Area
1. Fixed cost method (Yes/No/ NA)
Advantages: useful to manage variable costs in realizing profits
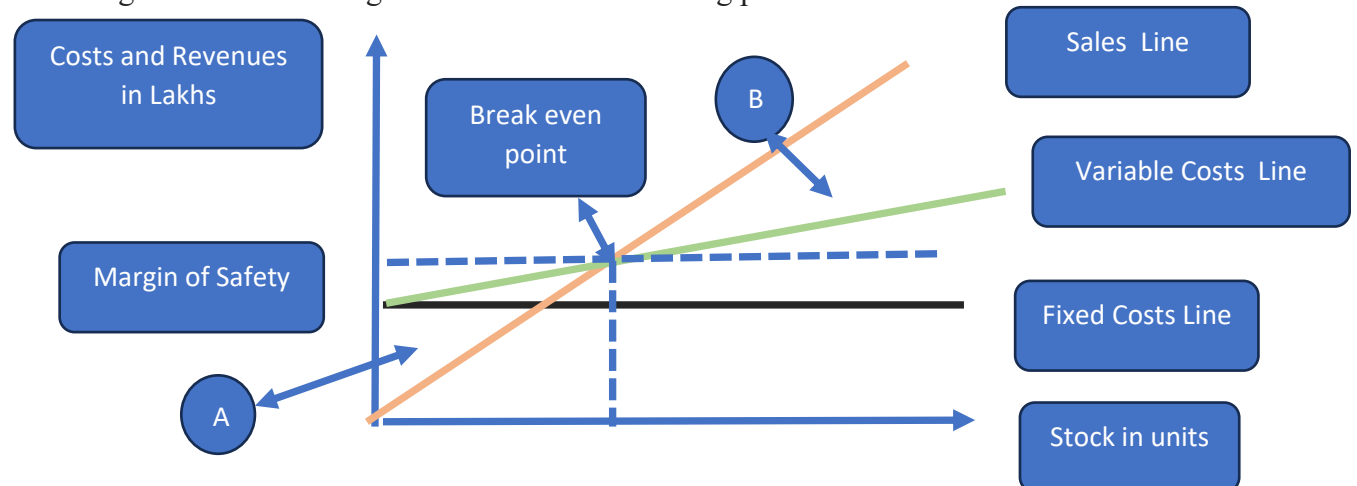
2. Variable cost method (Yes/No/NA)
Advantages: useful for decision making in recovery of costs at various stock levels before profits are realized
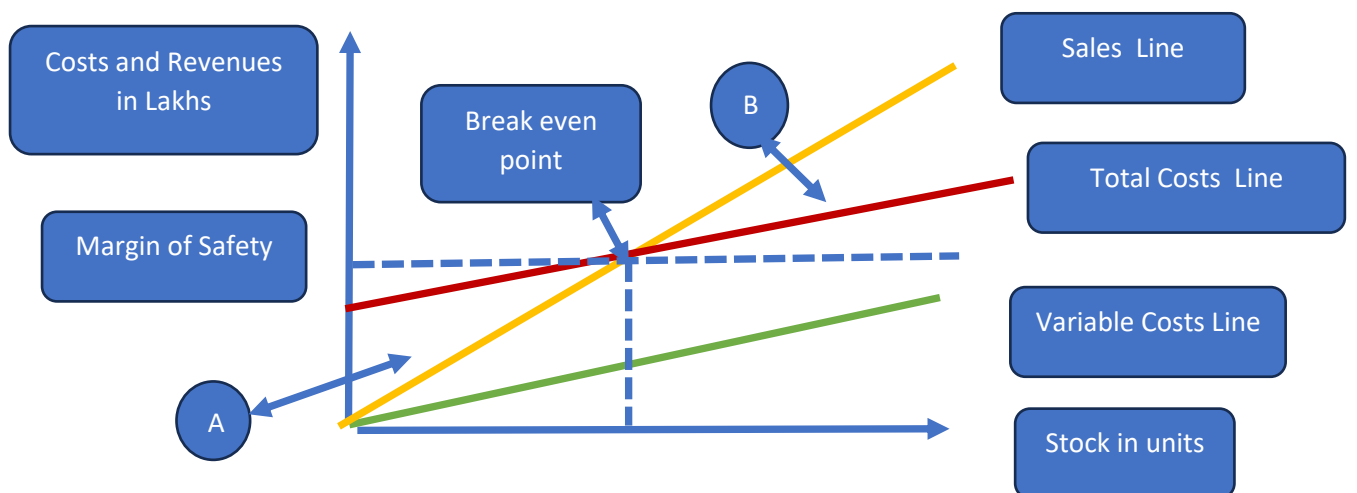
3. Contribution line method (Yes/No/NA)
Advantages: Contribution per unit used to manage variable costs in realizing profits
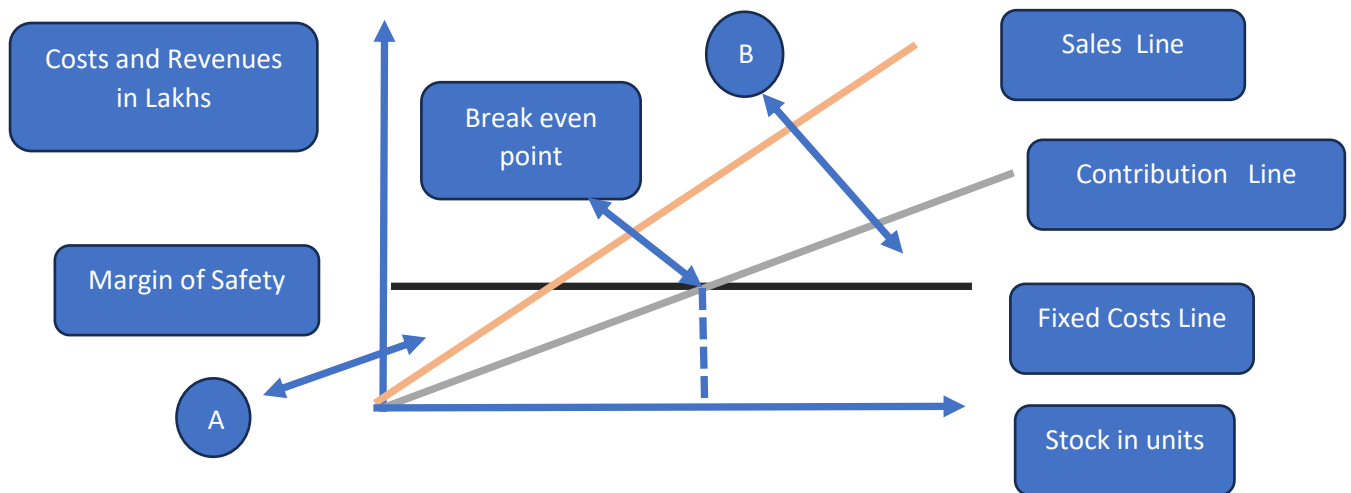
Assumptions by the organization in using the Break even charts

1. All costs can be separated into fixed and variable costs (Yes/No/NA)

2. Fixed costs will remain constant and will not change with change in level of stock (Yes/No/NA)

3. Variable costs will vary in the same proportion in which volume of stock varies. Here stock is due to production of vehicles by the organizations (Yes/No/NA)

4. Selling price will remain regulated or stable despite change in competition or change in volume of production (Yes/No/NA)

5. Number of vehicles sold needs to be equal to the number in stock based on Inventory turnover (Yes/No/NA)

6. There will be no unbounded change in operating efficiency of production department (Yes/No/NA)

7. Product mix is well planned (Yes/No/NA)

8. Product manufacturing methods and methods of selling will not change without holistic planning (Yes/No/NA)

Improving Performance Evaluation at the organization
Today's performance evaluation can be in terms of

(1) **Responsibility Centres**   (Yes/No/NA) such as
(A) Cost Centres
(B) Revenue Centres
(C) Profit Centres
(D) Contribution Centres
(E) Investment Centres
Under this system, divisions or units of the organization (under the specified authority of a manager) are developed as Responsibility Centres and evaluated individually for this performance
Remarks:

(2) **Budgetary Control and Reporting** (Yes/No/NA)
Remarks:

(3) **Balanced Scorecard** (Yes/No/NA) from multiple perspectives such as
(A) Customer perspective
(B) Internal Business perspective
(C) Learning and Growth perspective
(D) Financial perspective
Remarks:

(4) **Variance analysis** (Yes/No/NA)
This is in respect to each element of costs and sales like Direct Materials (or Parts or Resource) variances, Direct Labour variances, Overhead variances and Sales variances
Remarks:

(5) **Contribution Margin** (Yes/No/NA)
Calculated as a difference between sales and the variable costs of these sales
Remarks:

(6) **Return in Capital Employed (ROCE) or Return on Investment (ROI)** (Yes/No/NA)

ROI = (Operating Profit/ Capital employed) X 100

Operating profit = Profit before interest on long term borrowings and tax

Capital employed = Fixed assets + Current assets - Current liabilities

Or as applicable

Capital employed = Equity share capital + Preference share capital + Undistributed profit + Reserves and surplus + Long term liabilities - Fictitious assets - Non business assets

Remarks:

(7) **Residual income (RI)** (Yes/No/NA)

RI = Profit - Cost of capital

RI = Profit - (Required rate of return X investment)

Asset turnover = Turnover / Divisional investment

Remarks:

(8) **Economic Value Added (EVA)** (Yes/No/NA)

It is the return the business earns in excess of the minimum required by the investors

EVA = Net operating profit after tax - (Weighted Average Cost of capital X Capital employed)

Cost of capital = Average Capital employed X Weighted Average cost of capital

Financial leverage = Profit before interest and tax/ Profit before tax

Profit before tax = Profit before interest and tax - Interest on borrowings

Remarks:

(9) **Benchmarking** (Yes/No/NA)

It is identified as a continuous information sharing process adopted by a business internally and externally to identify its strong or weak points against the toughest competition to improve the activities carried out and services provided

Benchmarking involves 6 steps:

(i) Identifying key variables

(ii) Selecting comparative companies

(iii) Gathering required data

(iv) Increased budget for idea generation and training

(v) Evaluating and interpreting the performance gaps

(vi) Improving performance to achieve distinctive brand equity and global level operations

Remarks:

(10) **Ratio analysis** (Yes/No/NA)

Remarks:

(11) Also important are **non-financial quality performance measures** (Yes/No/NA) such as
(1) Market share for each product
(2) Product leadership
(3) Product or Service quality
(4) Delivery reliability
(5) Productivity
(6) Labour or Personnel turnover
(7) Personnel development
(8) Personnel satisfaction
(9) Customer after-sales service
(10) Customer satisfaction
(11) Employment opportunities
(12) Minimization of wastage and losses
(13) Social responsibilities
(14) New technology adoption
Remarks:

Steps to overcome the limitation that a break-even chart does not account for capital employed

1. Use of Budgeted costs in all managerial decisions (Yes/No/NA)

2. Relying on a business vision, mission and culture for cost control (Yes/No/NA)

3. Use of Sales Variance calculations for cost control (Yes/No/NA)

4. Use of a Cash break even chart (Yes/No/NA)

A Cash break even chart uses only cash fixed costs in break-even calculations

The formula being Cash break-even = Cash Fixed Costs / Cash contribution per unit

Here
(a) Cash costs do not include depreciation

(b) Depreciation in unsold stock is taken care by the organization using discounted sales or special sales

Cost reduction

For the organization, cost reduction is a reduction in the costs of product sales or services without affecting the use, quality, brand equity, and global level performance measures

Aim of Cost Reduction:

The aim for cost reduction for the organization could be

(1) To increase profits

(2) To manage operations and administration effectively

(3) To make money available for employee development or welfare schemes

(4) To meet competition effectively at the dealership level

(5) To increase productivity or performance

(6) To remedy performance gaps or search for continuous improvement

(7) To reduce costs without bringing a conflict between departmental or individual objectives and organizational objectives

Cost reduction programme:

For the organization it could mean

(1) Creation or improvement of Responsibility Centres (Yes/No/NA)

(2) Value Analysis schemes (Yes/No/NA)

(3) Continuous work function planning or orientation with corrective action (Yes/No/NA)

Tools and techniques:

For the organization, the cost reduction programme could include steps like

(1) Value Engineering Analysis (Yes/No/NA)

(2) Work study (Yes/No/NA)

(3) Operations research (Yes/No/NA)

(4) Simplification and standardization (Yes/No/NA)

(5) ABC analysis (Yes/No/NA)

Scope of Cost Reduction:

For the organization it could include work function planning or improvement for

(1) Product sales and/or service design such as cost reduction via Material or Parts cost control, Labor or Personnel cost control, Reduction in costs via Standardization or Simplification, Reduction in cost of sales and/or after-sales services, Reduction in complaints or feedback redressal costs (Yes/No/NA)

(2) Organizational methodologies for business functions (Yes/No/NA)

(3) Facility layout and equipment (Yes/No/NA)

(4) Business function - Planning, Programme and Methodology incorporation like QCD methodology evaluation, Strategic learning system for HR, Customer Engagement cycle, First Contact programme, Responsive CRM programme, the TGMB programme, the GII scorecard programme (Yes/No/NA)

(5) Operations and Administration (Yes/No/NA)

(6) Marketing (Yes/No/NA)

(7) Personnel management (Yes/No/NA)

(8) Material or Parts control (Yes/No/NA)

(9) Financial management (Yes/No/NA)

(10) Utility services (Yes/No/NA)

Value analysis:
It is the systematic identification of unnecessary costs and effectively reducing or eliminating them via identifying and removing unnecessary costs for
(1) Product sales (Yes/No/NA)
(2) Service (Yes/No/NA)
(3) Managing Quality of service (Yes/No/NA)
(4) Managing productivity or performance (Yes/No/NA)
(5) Responsive CRM (Yes/No/NA)
(6) Customer engagement to achieving more Customer satisfaction (Yes/No/NA)
(7) Achieving different levels of value for the product or service such as use value, brand equity value, cost value for sales and/or services, and still to be incorporated exchange value such as exchange of old vehicle for a newer model or exchange of old vehicle for EV model (Yes/No/NA)

Note: Here value is related to the assessment result for a budgeted profitability function to the related costs for providing sales and/or services

Profitability functions can be Responsibility Centre specific, Cost Centre specific or Cost reduction specific

Value analysis techniques:
For the organization it could include proposals such as the CRM dashboard at the macro level, and Budgetary control at the micro level

Value Engineering:
Though connected with value analysis, for the organization, value engineering could include
(1) Fit for the market Product sales or services programmes like the recommended Customer Engagement cycle
(2) Design for performance programmes like the recommended Responsive CRM
(3) Technology for performance or operations such as Fleet maintenance solutions, vehicle monitoring and management solutions, OBD2 incorporation
(4) Strategic learning system for HR, KPI(s), and QCD objectives
(5) Forecasting demand or economic demand management for specific products and/or services

16. INVENTORY TURNOVER AND STOCK KEEPING

Spares Parts Inventory Management

The report expects to help make the organization's inventory systems more responsive

Though a dealership competes with other sane brand dealerships this function of spare parts inventory management must be measured, monitored and managed from an individual dealership point of view.

This point of view depends upon the current automobile market, its economics and the responsiveness needed from the business's vision and operational practices

Managing the spare parts inventory is a complex system of processes and responsibilities for driving RoI, profitability, performance and customer retention

The spare parts department deals with challenges such as
1. Vehicle maintenance & repair intervals and requirements

2. Increased dynamics or competition from the after-market, the grey market and non-OEM parts suppliers

3. Increasing technology and replacements costs of parts

4. Impact of parts inventory on workshop productivity, and digitally-connected service centres & shop floors etc

5. Impact of eCommerce or online selling on automobile spare parts supply or sourcing

Q & A for the Spare Parts Inventory System (SPIS)

1. How is the performance of the SPIS analyzed?

2. What are the key performance metrics for the SPIS?

3. What are the current problems in the SPIS?

4. Can you rank the problems? Is there any root cause analysis available for the problems?

5. Are there "lost customer numbers" issues?

6. How has the Management dealt with these issues?

7. How is the SPIS safe from data inconsistency?

Observations

For sustainable development and growth, the spare parts management systems must focus on 3 areas
1. Service levels
2. Profitability
3. Dealership sales

Here these service levels help a dealership improve overall customer retention and in time increase market penetration via vehicles sales or repeat purchases from the dealership

Some key metrics for improved inventory management and profitability of business are
1. Days supply
2. Fill rate
3. Obsolescence
4. Non-stock
investment
5. Non-stock parts usage in service or repairs
6. Emergency purchases
7. Lost customer numbers

Days supply

2 factors that constrain inventory are
(1) High cost of net working capital (or borrowing rate)

(2) Levels of obsolescence in parts inventory

(3) Levels of non stock investment

Calculations should be generally based on 15-day, 30-day, 90-day, 180-day, 360-day averages for services, gross profit and cost of operations compared against total parts inventory investment, where there can be variances due to
(a) Seasonal demands
(b) Service campaigns
(c) Ancillary product or part supply for free services, charged services, AMC and accidental repairs

Step 1
(a) Total parts and accessories inventory usage in INR
(b) Gross profit from usage in INR
(c) Cost of parts usage in vehicle maintenance and repair specific to intervals and requirements, in INR

Step 2
(a) Current inventory total in INR
(b) Cost of parts usage from Step 1 in INR
(c) Days supply X 30.47 =
(d) Gross turn rate = 360÷(c)

Here 30.47 is the average number of days in an accounting month

An optimal turn rate needs more related comparisons between inventory specific RoI and cost of net working capital

Fill rate
In a dealership such as a dealership[/Service Centre transactional fill rate is important as it indicates whether the inventory investment is appropriately planned or controlled

Transactional fill rate (as applicable)
(1) Maintain a tracking sheet at the counter
(2) In the tracking sheet make a notation whether service order/repair/replacement is not filled from on-hand shelf stock
(3) Establish a non part number related method of posting a lost sale or lost customer satisfaction rating whenever a service order/repair order/replacement order is not filled from on-hand stock
(4) Then use this method to calculate the transactional fill rate, that is as total number of lost sales or lost customer satisfaction ratings ÷ total number of service orders/repair orders/replacement orders
(5) While establishing the non-part number it may be simple to append the 'non-part' with FS, or S, or AMC, or AR to indicate Free service transactional fill rate, or Charged service transactional fill rate, or AMC service transactional fill rate, or Accidental repair transactional fill rate

Obsolescence
The causes for this are
(a) unused special order parts and accessories
(b) significantly high number of parts returned by the Service centre/workshop/service order personnel
(c) parts ordered either by error or as a result of improper analysis of vehicles in service

To maintain the levels of obsolescence, a dealership can use the method of calculating the working capital to maintain obsolete parts (termed as suspended working capital)

Steps for calculating obsolescence aspects
(a) Total INR value of obsolescence
(b) Cost of working capital (borrowing rate X annual cost of suspended working capital)

Annual cost of suspended working capital represents a negative RoI to the dealership and should be balanced against the profitability that the part may be used to therein generate a profit for the dealership

As a Management insight, a part that has not been used in service/repair/replacement for the brand/model/variant in a service order schedule for the last 12 months has an increased chance of obsolescence

In these scenarios any definition or redefinition of parts obsolescence must concern itself with associated issues such as
(1) Repair delays
(2) Additional handling
(3) Emergency purchases
(4) (Loaned) Vehicle policy expenses
(5) Costs to productivity
(6) Reduction in customer satisfaction and retention leading to reduced overall profitability

Non stock as a % of investment:
The metric gives a comparison of total investment volume, part number count and part number piece count

As this metric reflects non-stocked inventory, the factors that affect this metric are
(1) Large volume service orders
(2) Dealership collision (in terms of sourcing/supply from OEMs and manufacturers)
(3) Volume of eCommerce parts orders

Testing a part for demand may mean calculating it as a % of non-stock investment, where higher levels of non-stock investment indicate special orders, emergency purchases, cases of dealership collision etc

Non-stock as a % of usage or sales:
One method of calculating this metric is by comparing the % of non-stock investment in INR versus the % of non-stock usage or sales in INR

This ratio will indicate the volume of special orders, emergency purchases that are being processed to fulfil service orders or service demands

The factors that affect this metric are
(1) Maintaining excessively low Days supply
(2) Premature returning of parts by Service centre/workshop/ Service order personnel due to OEM/manufacturer/factory obsolescence returns
(3) Inconsistent recording or no recording of lost sale or lost usage requirement or lost customer satisfaction rating
(4) Excessive stock/ order editing, tweaking or revisiting to show no issues in profitability
(5) Forecasting for parts related sourcing mechanism parameters or setup considerations

Emergency Purchases
These are decisions taken to promote higher level of customer service.

Increase in emergency purchases lower net profitability of the parts department and thereon the dealership.

Emergency purchases include the following
(1) Markup factor as a small %
(2) Administrative costs of issuing and reconciling purchase orders
(3) Time associated with contacting another supplier and placing the order
(4) Costs related to delivery or picking up of a part including the vehicle, driver and fuel costs

(5) Lost productivity in the workshop and/or parts department or supply staff

Commonly the overall acquisition cost for Emergency purchases multiplies exponentially causing the purchase costs to be many times higher than the cost of sourcing a part from the regular supply chain

It is important to analyze the "dealer to supplier" trends or cycles of purchases to monitor or validate systems, or methodologies and/or their associated relationships while purchasing parts

Lost customer numbers
If the lost customer numbers recording is not consistent then information may not be available about whether the issue was due to
(1) unfulfilled demand
(2) service order or service workload complexity
(3) parts inventory stock keeping problems
(4) after the lost... incidence ordering issues

The delays in consistent recordings or notifications can cause
(1) Duplicate or incorrect demand reporting
(2) a vehicle being held up in the workshop
(3) issues in service order or repair order or replacement order fulfilment

Lost customer numbers issues are important components of the overall inventory demand structure, where the management of which can mitigate issues in levels of customer retention and overall profitability

Evaluating the inventory systems and model

The main aspects of a spare parts inventory system is to help the dealership, the service centre or workshop, and the parts department relate to issues like
(1) Demand management avoiding over stocking and under stocking
(2) Losses due to spoilage, pilferage and obsolescence
(3) Minimizing of inventory carrying costs while increasing the efficiency of the order point of the parts inventory system
(4) Categorizing of parts as
(a) Regular parts that are not costly or costly
(b) On-demand parts that are not costly or costly
(c) Non stock parts that are not costly or costly
(d) Emergency purchase parts that are not costly or costly

The Theoretical model for the order point is as follows

$TMOP = (LT + SS + BP) \times$ unit sales per day
Here
LT: LEAD TIME
SS: SAFETY STOCK
BS: BUFFER STOCK

Responsive model for order point is as follows

RMOP = (Fta x LT) + (Fta x LT) (%Cost$_{sl}$ + %Cost$_{cpfr}$ + %Fta-devation+ %Fill rate-deviation + %LT-deviation)

LT: Lead time
Fta: Forecast - trends adjusted
sl: Service level
cpfr: Productivity or Profitability via Collaborative Planning Forecasting Replacement

Note:
(I) RMOP will need to be calculated separately for parts categorizations (A), (B), (C) and (D) for not costly parts and then for costly parts

(II) Collaborative Planning Forecasting Replacement (CPFR) strategies will need to address issues like (1) unregulated costs, (2) unmanaged demand, (3) inventory turnover and (4) Part criticality

(III) Orders placed can be classified as
(1) Regular orders
(2) Breakdown traction orders
(3) Emergency purchase orders and
(4) Non-stock orders, where variations due to data inconsistency, discount terms and order validity affect the responsiveness of the spare parts inventory system

Data inconsistency: issues like

(1) Data redundancy in parts codification
(2) Inadequate documentation of inventory, and parts, or their codification
(3) Demand data
(4) Forecast data
(5) Lead time data
(6) Order point data
(7) Selling price data and Cost price data
(8) Lost customer satisfaction rating data and if relevant Lost sales data
(9) Base stock data and safety stock data
(10) Inventory carrying costs data

Deciding on the model or approach:

The decision for the order point approach and percentage deviation can be taken by
(1) Comparison of Conventional theory order point (CTOP) with Actual base stock
(2) Comparison of Responsive model order point (RMOP) with Actual base stock
(3) Comparison of CTOP with RMOP
(4) Comparison of inventory costs with inventory carrying costs

The objective for decision making should be to decrease inventory costs and inventory carrying costs

The order point strategy for the organization must be based in a combination of the push approach and pull approach, where responsiveness is a main factor

Push approach: Manufacturer or the manufacturer's network drives demand or order point
Pull approach: The dealer drives demand for spare parts
Responsive approach: Trends adjusted forecasting drives demand

17. STRATEGIC LEARNING, TRAINING AND SKILLS DEVELOPMENT

Highlight

To help an organization develop a cut-to-fit strategy and competitiveness, the management will need to sustainably relate to the current scenario of workforce dynamics, budget cuts or re-working, small or no pay increases, competence HR practices.

We feel that developing competent HR systems and competent HR professionals is the management perspective that can help.

HR must work with a positive attitude to facilitate and implement a "strategic learning system" for decision making related to the influences such as "business dynamics, budget variance, expectations of small, predictive or market re-oriented pay increases, action planning for future outcomes or events, recommendations for course of action".

Steps

Reviewing the available feedback on the organization, any solution finding will need to use different facilitators and KPIs to manage business dynamics and also align for future outcomes & events.

The empirical study proposes forms to help record, evaluate and manage issues related to:

1. Expectation and Code of Conduct

2. Future outcome or event Advisories

3. Course of action Advisories

4. Cost ownership Advisories

Refer to the Appendix Strategic Learning System for proposed forms.

KPI(s) or Measurement metrics:
Retention Rate for:
(1) Head office:
(2) Service Centre/Workshop:
(3) Showroom:

Attrition rate for:
(1) Head office:
(2) Service Centre/Workshop:
(3) Showroom:

Role Profiles and job descriptions **(As currently applicable)**

An organization may have defined different role profiles and thereon actively associated a job description with each of them to help design performance and effectiveness in its HR practices.

Table 17.A: Role Profiles

Role Profile	Whether there is an Associated Job description?	Other details
Accounts Executive	Yes	Last updated: KRA/KPA Measures:
Accounts Officer/Manager	Yes	Last updated: KRA/KPA Measures:
Front Office Executive	Yes	Last updated: KRA/KPA Measures:
CRM	Yes	Last updated: KRA/KPA Measures:
Sales Executive	Yes	Last updated: KRA/KPA Measures:
Sales Manager	Yes	Last updated KRA/KPA Measures:
HRM	Yes	Last updated KRA/KPA Measures:
Service Manager	Yes	Last updated KRA/KPA Measures:
Warehouse Manager	Yes	Last updated KRA/KPA Measures:
COO	Yes	Last updated KRA/KPA Measures:

KRA: is a short form for Key Responsibility Areas

KPA: is a short form for Key Performance Areas

Note: A GII report apples to the KPA/KRA/JD for each profile with revisions to suit the company policy

Performance rating (overall based on (job specific) subjective and objective (organizational culture specific) parameters) for

(1) Head office: Appraisal method

(2) Service Centre/Workshop: Appraisal method

(3) Showroom: Appraisal method

This could relate to accountability expectations such as

1	Business Outcome focus
2	Customer focus
3	Honesty and Integrity
4	Respect for organizational policies and strategies (Discipline, Attendance, Leave patterns)
5	Loyalty

This could relate to subjective and objective development goals such as

1	Goal setting
2	Patterns learning
3	Loyalty
4	Mobility
5	Technical know-how
6	Achievements orientation
7	Initiative
8	Planning and organizing
9	Urgency and Time management
10	Communication
11	People management
12	System / Process orientation
13	Logical thinking
14	Adaptability

Training specific feedback for:
(1) Head office:
(2) Service Centre/Workshop:
(3) Showroom:

This could relate to broad expectations such as

1	Management knowledge
2	Management attitude
3	Discipline
4	Human Relationship
5	Responsibility
6	Positiveness and Stress Management
7	Cost consciousness
8	Job Competency and/or Technical knowledge
9	Communication
10	Creativity
11	Leadership
12	Team building (for management staff)

Figure 17.1: Time management based on the 4 quadrants method

Q1 (Important and Urgent)

Crisis resolution

Pressing problems

Deadline-driven projects

Q2 (Important and not Urgent)

Preparation, Planning and Preventive Activities

Relationship building

Personal growth / Capability improvement

Q3 (Not Important and Urgent)

Interruptive activities

Emails, calls, meetings

Popular activities

Pressing matters

Q4 (Not Important and Not Urgent)

Trivia work, busy activities

Time wasters

Some calls and emails

Pleasant activities

Strategic Learning System for HR

1. Expectation and Code of conduct Form

Period under review: From_____ To _____

Appraisal Date: **Last Appraisal Date:**

Business unit:

Employee strength:

Applicable department / associated function (Select from the following)

☐   Managing Director (Advisory role)

☐   Top management (Advisory role)

☐   HR and CRM

☐   Sales and Marketing

☐   Finance

☐   Accounts

☐   Billing

☐   Service Centre

☐   Inventory and Spares

☐   Engineering and Operations

☐   IT

Associated function – staff strength:

The appraisal identifies different attributes for associated functions, where some of the attributes are significant and make a difference in the organizational strategy to work, perform and sustain performance and profits.

The Ratings can be

Excellent – with a score of 9-10

Good – with a score of 7-8

Fair – with a score of 5-6

Marginal – with a score of 3-4

Poor – with a score of 1-2

NA – with no score or a score of 0

Inferences will be drawn on the basis of the comparison of the cumulative Appraisee score and cumulative Reviewers score.

If there is an agreement, then inferences will be drawn on the Rating Agreement

Summary of inferences

Comparison	Focus	Comments
Appraisee rating matches Reviewers rating	Focus on implementors	
Appraisee rating less than Reviewers rating	Focus on specific facilitators and implementors	
Appraisee rating more than Reviewers rating	Focus on specific implementors	

Associated function – appraisal period: Monthly/Quarterly/**Semi-annually/Annually**

Sl No	Expectation and Code of conduct	Appraisee Rating	Appraisee Comments	Reviewers Rating	Reviewers Comments	Agreement For Rating
1	Work culture adherence					
2	Job competency specific Learning areas					
3	**Response to specific situations**	-------------	-------------	-------------	-------------	-------------
3.1	Performance standards					
3.2	Competency level					
3.3	Accountability					
4	**Response to new situations (New Tech/Product)**	-------------	-------------	-------------	-------------	-------------
4.1	New responsibility					
4.2	New technical know-how					
4.3	New Team building					
4.4	New cost consciousness					
5	Commitment					

6	Inter-personal Communication Ability					

Cumulative Appraisee score:

Cumulative Reviewers score:

Cumulative Agreement-rating score:

2. Future outcome or event Advisories (as recommendations from experts/auditors/visiting consultants)

Period under review: From_____ **To** _____

Appraisal Date: **Last Appraisal Date:**

Business unit:

Employee strength:

Applicable department / associated function (Select from the following)

☐   Managing Director (Advisory role)

☐   Top management (Advisory role)

☐   HR and CRM

☐   Sales and Marketing

☐   Finance

☐   Accounts

☐   Billing

☐   Service Centre

☐   Inventory and Spares

☐   Engineering and Operations

☐   IT

Nature of concern/Subject of interest

☐ (1) CRM Dashboard
☐ (2) Key Performance Indicators
☐ (3) Satisfiers/ Dissatisfiers Evaluation
☐ (4) Feedback and Surveys
☐ (5) Complaints and Redressal
☐ (6) Management Intervention
☐ (7) Dealer level escalation

Advisory

☐ (1) Review / Improve Quality control (for nature of concern)
☐ (2) Review / Improve Cost control (for nature of concern)
☐ (3) Review / Improve Delivery system (for nature of concern)

Associated advisory – period: Monthly/Quarterly**/Semi-annually/Annually/**
Recommendation specific

Sl No	Future Outcome or Event specific Recommendations	Nature of concern (1) to (7)	Monthly Advisory (1) to (3)	Quarterly Advisory (1) to (3)	Semi-annual Advisory (1) to (3)	Annual Advisory (1) to (3)
1	Method improvement					
2	Process improvement					
3	Technology improvement					
4	Product line improvement					
5	Service improvement					
6	Cash flow improvement					
7	Market strategy improvement					

Appraisee comments:

Reviewers comments:

Agreement-comments:

3. Course of action Advisories (as recommendations from management

Period under review: From _____ **To** _____

Appraisal Date: **Last Appraisal Date:**

Business unit:

Employee strength:

Applicable department / associated function (Select from the following)

- ☐ Managing Director (Advisory role)
- ☐ Top management (Advisory role)
- ☐ HR and CRM
- ☐ Sales and Marketing
- ☐ Finance
- ☐ Accounts
- ☐ Billing
- ☐ Service Centre
- ☐ Inventory and Spares
- ☐ Engineering and Operations
- ☐ IT

Nature of concern/Subject of interest

☐	(1) CRM Dashboard
☐	(2) Key Performance Indicators
☐	(3) Satisfiers/ Dissatisfiers Evaluation
☐	(4) Feedback and Surveys
☐	(5) Complaints and Redressal
☐	(6) Management Intervention
☐	(7) Dealer level escalation

Action plan for 5 objectives

☐	(1) Review / Improve Process map (for nature of concern)
☐	(2) Review / Improve P-D-C-A cycle (for nature of concern)
☐	(3) Review / Improve KPI(s)/KPA(s) (for nature of concern)
☐	(4) Review / Improve KRA(s) (for nature of concern)
☐	(5) Review / Improve Capability and Maturity (via the use of First Contact (Refer to Page 92) and Responsive CRM)

Associated advisory – period: Monthly/Quarterly/**Semi-annually/Annually/**

Recommendation specific

Sl No	Course of Action specific Recommendations	Nature of concern/ Problem Solving/ Next steps (1) to (7)	Monthly Action Plan (1) to (5)	Quarterly Action Plan (1) to (5)	Semi-annual Action Plan (1) to (5)	Annual Action Plan (1) to (5)
1	Method improvement					
2	Process improvement					
3	Technology improvement					
4	Associated Department/Function improvement					
5	Service improvement					
6	Cash flow improvement					
7	Market strategy improvement					

Appraisee comments:

Reviewers comments:

Agreement-comments:

4. Cost ownership Advisories (work in progress)

Period under review: From_____ **To** _____

Appraisal Date: **Last Appraisal Date:**

Business Unit:

Employee strength:

Associated advisory – period: **Quarterly / Semi-annual / Annual/ Recommendation specific advice for improved Financial Ratios**

Sl No	Cost ownership specific Recommendations	Quarterly Advisory	Semi-annual Advisory	Annual Advisory	Recommendation specific Advisory
1	**Bridge financing**	--------------	--------------	--------------	--------------
1.1	Mergers and Acquisitions	--------------	--------------	--------------	
1.2	Micro-targeting customers / customer segments				
1.3	**Cost influencers**	--------------	--------------	--------------	--------------
1.3.1	Balance operations to manage costs				
1.3.2	Innovate to manage costs				
2	**Degree of risk focus**	--------------	--------------	--------------	--------------
2.1	Contingency funds				
2.2	Late stage capital				

**Appraisee comments:**

Reviewers comments:

Agreement-comments:

Balance to manage costs: Monthly/Quarterly**/Semi-annual/Annual/Recommendation specific use of 5 Whys for the cost profile**

Sl No	Balance operations to manage costs	Specific Review	Measurable Review	Achievable or Assurable Review	Relevant Review	Time related Review
1	Employee level learning					
2	Empowered learning					
3	Continuous learning					
4	Process/System/ Technology learning					
5	Learnings from Leadership					
6	Dialogue and Inquiry					
7	Team learning					

Appraisee comments:

Reviewers comments:

Agreement-comments:

Innovate to manage costs: Monthly/Quarterly/**Semi-annual/Annual/Recommendation specific use of 5 Whys for the cost profile, KOL objectives and brand equity**

Sl No	Innovate to manage costs	Specific Review	Measurable Review	Achievable or Assurable Review	Relevant Review	Time related Review
1	Focus on problems of practice					
2	Active learning through process of Inquiry and Presentation					
3	Collective ownership					
4	Appropriate to work culture (related to strengths and weakness)					
5	Appropriate to work culture (related to opportunities and threats)					

Key Opinion Leadership (KOL) objectives of: Reliability, Safety, Quality, Mobility as a valuable proposition*, and Customer Satisfaction

Brand equity developed by strategies for: Right Product/Service mix, USP, Competitive offers, Effective Promotion and Relevant influencer and selling psychology

PDCA and process improvement concepts (Figure 17.2)
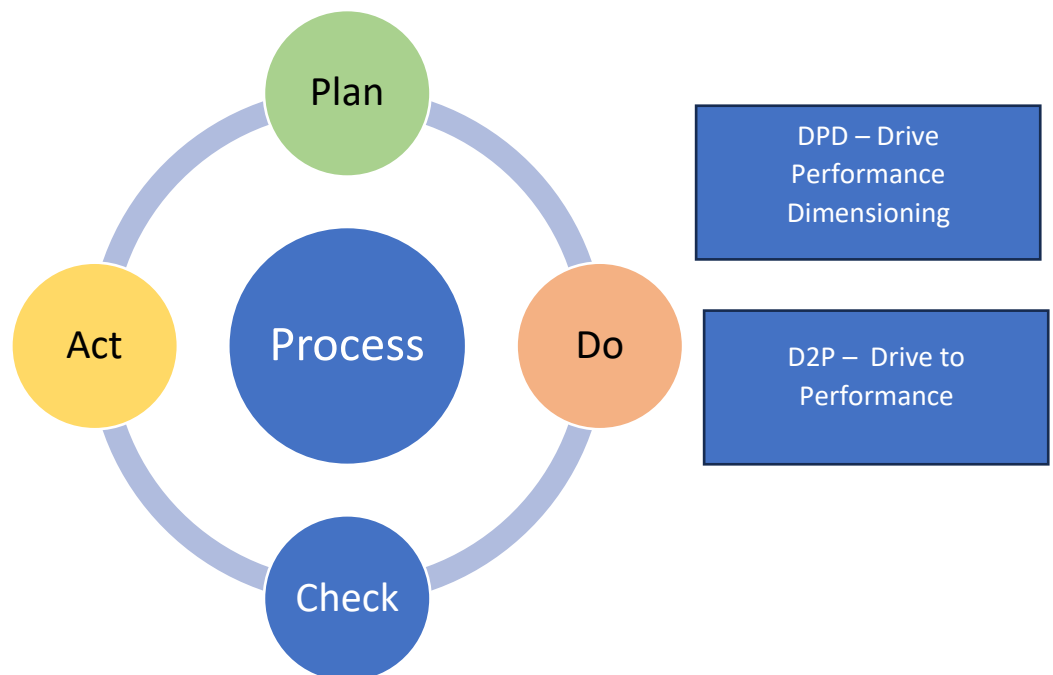
Steps that are to be followed in the PDCA cycle

Step 1: Select the DPD/D2P process to be improved and establish a well-defined process improvement objective
Step 2: Organize a team to improve the process
Step 3: Define the current process using a flowchart
Step 4: Simplify the process by removing redundant or unnecessary activities
Step 5: Develop a plan for collecting data and then collect baseline data
Step 6: Assess whether the process is stable
Step 7: Assess whether the process is capable
Step 8: Identify the root causes that prevent the process from meeting the objective
Step 9: Develop a plan for implementing a change based on the possible reasons for the process's ability / inability to meet the objectives set for it
Step 10: Modify the data collection plan developed (if this is necessary)
Step 11: Test the changed process and collect data
Step 12: Assess whether the changed process is stable
Step 13: Assess whether the change improved the process
Step 14: Determine whether additional process improvements are feasible

Effective Analysis

For the problem statement

Defined Insights:

- ❖ Do not have pre-conceived ideas of the problem/ but infer from internal or external data sets
- ❖ Always follow the genchi genbutsu principle of going to see to verify the source of the problem
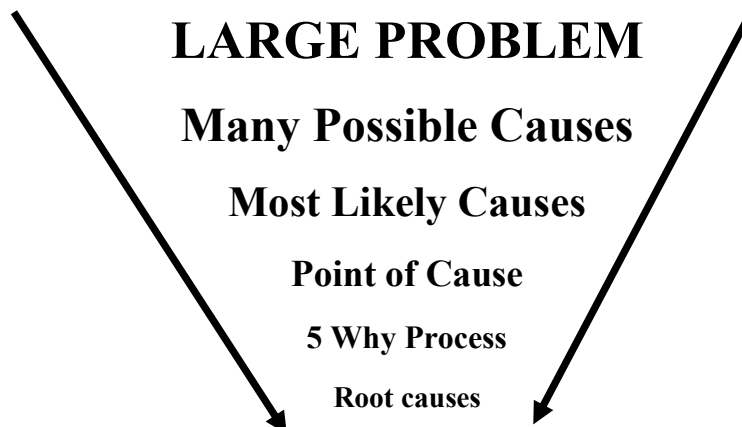
Step 1: Initial 5 Why Analysis (using 4Ms, details follow)

Step 2: Second 5 Why Analysis

Step 3: Value-added or Non-value added analysis

Step 4: Final pass 5 Why Analysis

Step 5: Narrowing and focusing process

LARGE PROBLEM

Many Possible Causes

Most Likely Causes

Point of Cause

5 Why Process

Root causes

Step 6: Piece it all together using the A3 one-page report

Figure 17.3: Process Map

PROCESS MAP	WHO? STEP?	SAMPLE TEMPLATE OF A FLOW CHART				
		D2P DEPARTMENT/TEAM	GROUP 1	GROUP 2	.....	GROUP XYZ
	PLAN	Request for.. →				
	DO					
	CHECK					
	ACT	Request satisfied ←				
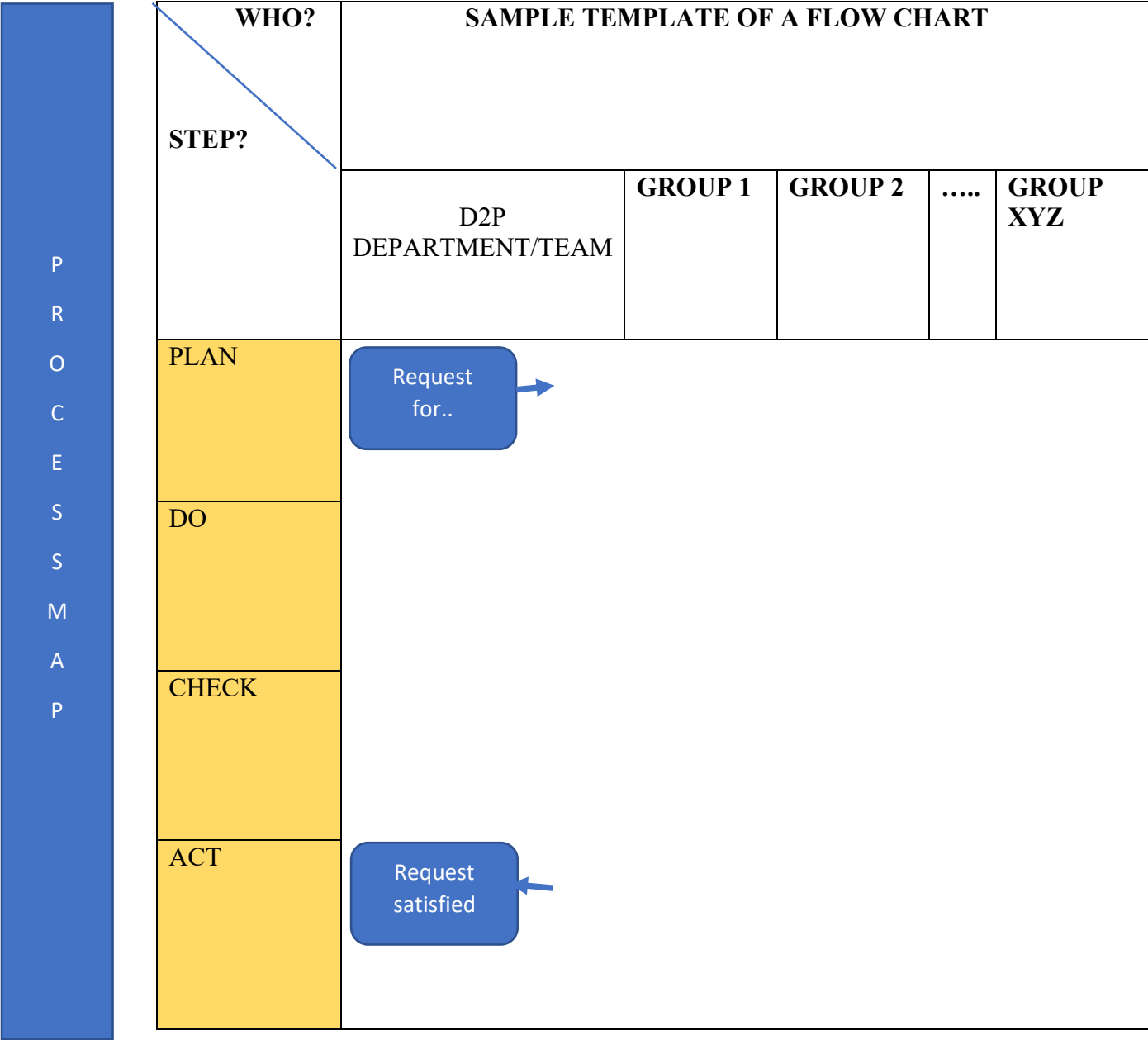
Figure 17.4: 5 Whys (using a SMART focus for DPD/D2P expectations)

MONEY AND MATERIALS

MOTHER NATURE AND MANAGEMENT PROCESS

Why
Why
Why
Why
Why

Why
Why
Why
Why
Why

PROBLEM TO BE ANALYZED?

Why
Why
Why
Why
Why

Why
Why
Why
Why
Why

MANPOWER

MACHINE
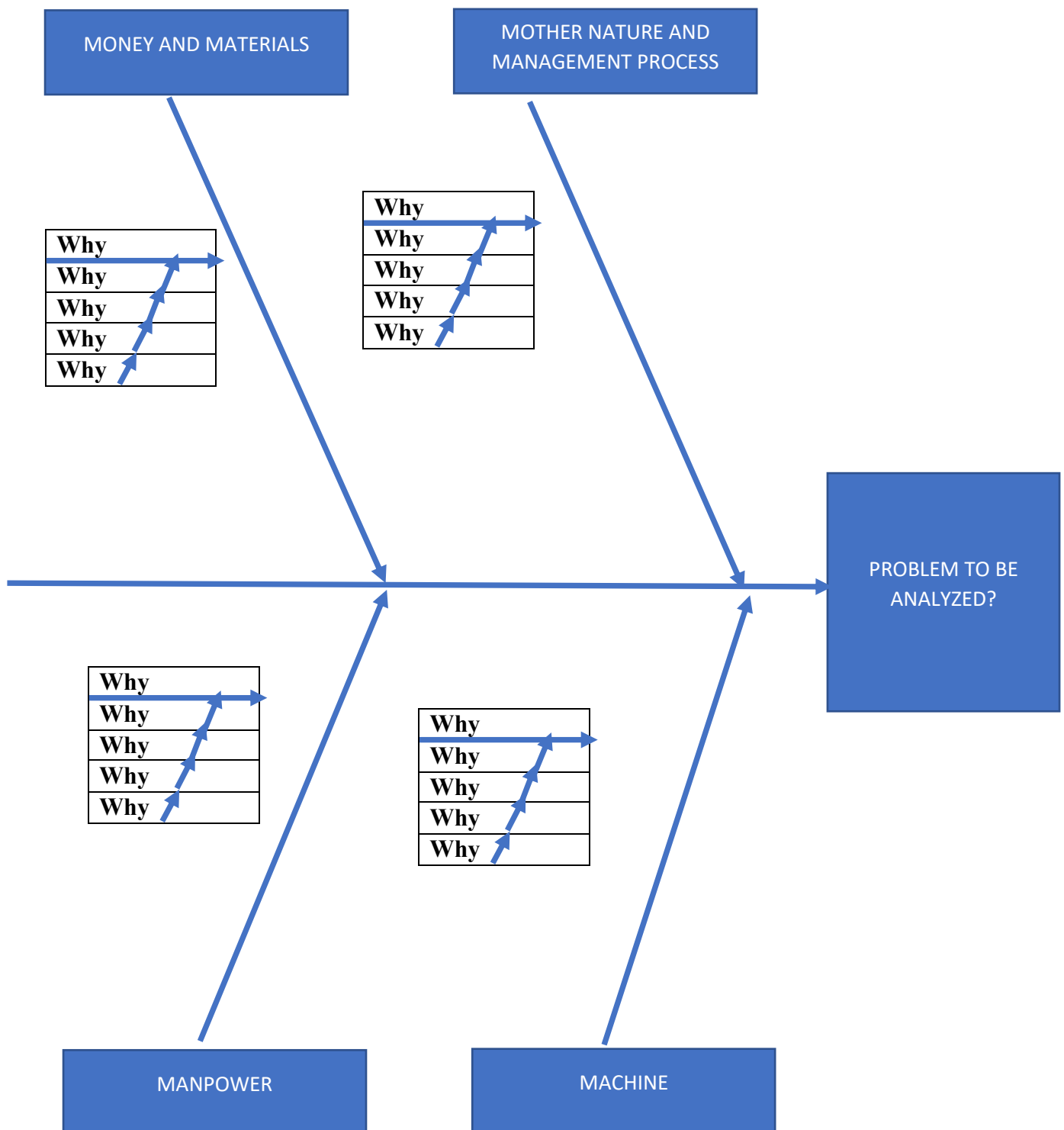
18. Associated Works Improvement for the PSW / Workshop (in serving and satisfying)

The interest is to help Work-planning, Work-breakdown, and Associated Works, for example, Via the incorporation/improvement of the following steps in the window expected and for any pre, during and post improvement:

- **PSW Service Engagement** – explanation of the *organization's* standard operating procedure to the customer, at the PSW/Workshop
- **PSW Service Advisors** – Receive vehicle and start data recording
- **PSW Data recording** – Recording/Revising of information, issues, complaints, requests, and creation of the Vehicle Sheet and Job card
- **PSW Cost Centre Accounting system** – Open/update Job card in system
- **Arranging for any rally/race/event experience like use of In-Situ** Workshop Workshop RemoteLink
- **Job card responsiveness from PSW Inspection/PSW Service to Worshop Floor**
- **Job card allocation by PSW Supervisor to Workshop**
- **Allocated PSW Service Technicians takes vehicle and checks it**
- **PSW Service Activity planning/ revisions** – Creation / Validation of an Activity List using the Vehicle Sheet and Job card
- **If PSW Service Technician finds changes in Job card, informs PSW Supervisor**
- **Floor Supervisor carries out TMS estimation for work, labor and materials (Direct and indirect cost centre accounting programme)**
- **Floor Supervisor adds Confirmation and Approval for the cost centre accounting programme**
- **Schedule control and corrections for PSW Service Delivery**
- **Selecting any PSW Service Delivery assistance systems**
- **Reviewing of any Work instructions and decision-making for the Vehicle Sheet and PSW Job Card**
- **Service Technician attends to PSW Job card and nature of service**
- **If there is a need for part replacement Technician actuates and informs Supervisor**
- **Floor Supervisor carries out added estimation for work, labor and materials (Direct and indirect costs centre accounting programme)**
- **Supervisor and Technician add Confirmation and Approval for the cost centre accounting programme**
- **Update PSW Job card if necessary**
- **If necessary engage Supplier/ Stores for (parts/components/ sensors/ vehicle systems)**
- **Carrying out of the PSW Service Delivery with incorporation of Design-out Maintenance, Preventive Maintenance and Corrective Maintenance**
- **Closure / Revision of the Data recording and PSW Service Activity**
- **Completion of PSW Service, Final Inspection and Counter Measures as needed**
- **PSW Test simulation/PSW D2P simulation by supervisor**
- **Closure of PSW Job Card with Closure and Revision of the Data recording, D2P Hub Analytics, and PSW Service Activity**
- **Drop off (if not possible to continue)/ Continued participation of the vehicle**
- **Explanation of PSW nature of work for the cost centre accounting programme**
- **D2P Report for the cost centre accounting programme**
- **Sharing maintenance tips with PSW team/DPD ANALYTICS TEAM**

- **Communications/Feedback gathering (the D2P/DPD/Brand Analysis Scorecard)**
- **Feedback or expected closure of feedback for the cost centre accounting programme**
- **After next lap or completion of a sector, check whether vehicle is performing properly for the PSW Service Activity**
- **If there are issues in the next lap or sector, revisit nature of work in PSW Job card**

Potential improvement

- **Forecasting / Responsive Planning via AI and Machine Learning solutions for DPD/D2P effectiveness in the PSW/Workshop**
- **DPD/D2P effectiveness refers to the specific vehicle or number of vehicles of a particular brand/model/variant not needing PSW Service Activity Improvements. More vehicles of the same brand/model/variant, or vehicles re-engineered for DPD models/variants when needing servicing at or for the same rally/race/event represent different D2P management complexities or ease for the PSW Service Centre/ Workshop.**

Forecasting/Responsive Planning

Help in building more scope, intelligence and functionality via new D2P Hub analytics to design more DPD/D2P effectiveness and/or service intelligence and ensure continual improvement in the multi-nature rally/race/event specific solutions by the Brand manufacturer/REN/PSW Service Centre via AI and Machine Learning for these services

The stages involve creation/revision of a dataset that includes fields for the service such as

(1) Appropriate PSW Service Design, Engagement, Scheduling, Operations, Training and Continual Education

(2) Reliable demand and supply equations for Products or Parts or Systems

(3) Contingency planning in PSW Service Design, Engagement, Scheduling, Operations, Training and Continual Education

(4) Successful directing of people, best-practices-adherence, good to use methodology, correct way of working-culture

(5) Associated Value-added functions to suit the REN and to fulfil the DPD/D2P effectiveness

(6) Relevant D2P Hub Analysis for DPD/D2P Effectiveness in Vehicles and Hybrids

(7) AI/Machine learning for brand density in the PSW Service Centre/Workshop

Forecasting / Responsive Planning via AI and Machine Learning solutions for the Brand density in the PSW Service Centre/Workshop

The stages involve creation/revision of a dataset that includes fields such as

(1) Gathering and analysis of the vehicle sheet: Yes/No/Not applicable

(2) Screening of details and completion of What-is-to-be-done analysis: Yes/No/Not applicable

(3) Addition of any Design-out Maintenance, Preventive Maintenance and Corrective Maintenance: Yes/No/Not applicable

(4) Decision making for any Seasonal Changeover in service operations: Yes/No/Not applicable

(5) Estimation for work, labour, and materials: Yes/No/Not applicable

(6) Inventory of PSW Service Centre/Workshop assets, equipment, and systems for this brand/model/variant: Yes/No/Not applicable

(7) Level of workmanship specific analysis and decision making / corrective action: Yes/No/Not applicable

(8) Determination of PSW Service Centre/Workshop capacity and Reservation: Yes/No/Not applicable

(9) Detailing of Procurements and Job execution: Yes/No/Not applicable

(10) Easy-to-use Availability/Revision of brand/model/variant/service manuals, product/part/system references and documentation: Yes/No/Not applicable

(11) Time, Motion, and Scale (TMS) findings for PSW Service Design, Engagement, Scheduling, Operations, Training and Continual Education to improve DPD/D2P effectiveness, ease or cost of service, ease or cost of workmanship, QCDES assurance, and environment safety: Yes/No/Not applicable

Highlight of Time, Motion, and Scale (TMS) studies (to be discussed)

For example if we are interested in TMS for the PSW Service Centre/Workshop, we could focus on process / outcome identification, data collection, data analysis, findings and conclusions.

<u>Outcome identification:</u>

Forecasting / Responsive Planning for servicing vehicles with a particular brand density

For work process studies:

1. Decide on the number of times this evaluation must be done per day/week/month
2. Use the Stopwatch timer method for measurements
3. Analyze details in steps:

   (i) Flow chart each process

   (ii) Detail Information and operations in detail for each process

(iii) Determine Process time

(iv) Detail movement from one process to another process

For time studies:

Process	Current Time	Standard Time/ Required Time
PSW Service Scheduling		
PSW Service Operations		
PSW Service Delivery for expected Maintenance/Repair/Tuning		

Comparison of Total time for complete cycle of selected processes:

Process	Current Time	Standard Time/ Required Time
Total Cycle		

For PSW / lap / sector utilization studies:

Location	Current Effectiveness (%)	Proposed Effectiveness (%)

Workshop RemoteLink

A proposed solution to make PSW Service Delivery more affordable, accessible, innovative & collaborative. The solution can help improve Time, Motion, and Scale (TMS) studies important for PSW Service Engagement and Delivery.

First, set up a PSW Service Delivery Desk (based on the Help Desk concepts) to help make the various steps from Management Accounting to PSW Service Engagement to Communications/Feedback gathering for the DPD/D2P intent or need for PSW Service Workshop Activity.

Next, is to design/develop PSW Service Delivery assistance systems, that help the PSW / Workshop make its Service Activity more accessible and collaborative to its REN departments/supervisors/consultants and driver & co-driver teams too.

PSW /Workshop Safety Programme

1.Define role of a safety engineer, supervisor and safety committee

2. Assess current crashworthiness/safety/ lack of safety measures

3. Identify Accident types, causes, losses, prevention and mitigation measures

5. Identify need for crashworthiness protection devices

6. Plan and implement fire prevention and protection

7. Deploy fire extinguishers

8. Develop Safe Work practices

9. Design REN training programmes (based on REN / DPD/ OSHA guidelines)

10. Develop Incidence reporting/resultant management practices

11. For vehicles, design a crash worthiness programme for improved brand equity

Design-out Maintenance (only reviewed as a concept for health parameterization)

Design-out maintenance is a strategy that aims for improvement, and its focus is the improvement of the vehicle-system design to reduce the maintenance burden or even eliminating maintenance altogether for any health parametrization. Re-designing of improved ergonomics of the vehicle and its systems is another prerogative of design-out maintenance. Management of safety related to the vehicle's crashworthiness and crash mitigation is also another area of design-out maintenance.

Incorporation of Planned Maintenance

Advantages

1. Conceived by organizational support structure
2. Easier planning of competencies
3. Easier PSW/ Workshop Management
4. Easier planning and scheduling of maintenance
5. Easier mechanism of ordering spares
6. Even distribution of costs
7. Easier mechanism for conducting trainings and skills improvement

Incorporation of Preventive Maintenance

Advantages

1. Increased part/component/system operational life or availability
2. Allows for pre-emptive corrective action
3. Decreases part/component/system downtime
4. Decrease in costs for parts, components, systems and labour
5. Better product quality
6. Improved vehicle and environmental safety
7. Improved brand value
8. Energy savings
9. Estimated 8 to 12% cost savings over simple maintenance and repair
10. Improved use of diagnostics
11. Improved staff expertise and skills

Incorporation of Corrective Maintenance

Characteristics of Corrective Maintenance

1. It is generally planned

2. Whether it is planned or unplanned, the maintenance activity takes place depending on the nature of the problem and the type of vehicle/model/variant

3. Work is taken up after the breakdown with some time tag

4. Breakdown maintenance should not include maintenance activities for loss of human life, unprecedented vehicle accidents. It applies when breakdown of a part/component/system in the vehicle does not affect the entire functioning of the vehicle, or is predictable and for expected failures

Most brands/REN investments offer

(1) An REN **online / organizational database** to its REN departments/teams to record/manage/track of nature of work done on vehicle with details of parts replacement, electric systems/parts, ECM/ECU, Battery, Battery Management System etc where the DPD/D2P effectiveness is covered for the applicable REN/Real world Service Centres

(2) A REN **Helpline programme** where services of Road Side Assistance and repairs are provided with vehicle/driver & co-driver pickup from any location and drop off to the nearest Remedial facility.

The evaluation indicates that a PSW Priority Service Activity Planner can help an organization sustain any DPD/D2P improvement or effectiveness programme to ensure the vision of participating with a brand/vehicle, a DPD/D2P re-engineered vehicle and thereon building the crashworthiness and open-ended performance of the brand.

The vision behind ensuring a REN team or regular customer's plan to own a vehicle does have a really satisfying experience, sections of the Planner can be continuously studied for helping predictive & trustworthy performance ratings, and for any transition from a traditional maintenance system to the emerging OBD2 compliant system.

PSW Priority Service Activity Planner for sustaining a High-performance Experience

Rally/Race/Event: **Track:**

Rally/Race/Track Sector:

Rally/Race/Track Lap:

Checked by: **Date:**

Type of service:

[ ] Vehicle Inspection [ ] QCSES and Crash worthiness

[ ] Planned Maintenance:

[ ] Preventive Maintenance [ ] Corrective Maintenance

[ ] Call to attention Analytics

[ ] Breakdown [ ] Accidental Repair

Details:

Remarks:

1. Driver/Co-driver team:

[ ] New [ ] Experienced [ ] Referral

Type of vehicle (Tick as applicable): 4W/REN/ Toyota GR

Vehicle details:

2. Location:

3.a D2P Report Email   **3.b D2P Report Phone:**

4. Nature of participation (Tick as applicable):

[ ] Professional [ ] Amateur [ ] Via Financial Assistance [ ] Brand Analytics

5. Vehicle Reg No: **Present Lap/Distance covered:**

Date /Time of:

Last oil change:

Last oil filter change:

Last air filter change:

Last Spark plug change:

Last engine tune-up:

Last Degraded parts change:

Or Lap/Distance covered of:

Last oil change:

Last oil filter change:

Last air filter change:

Last Spark plug change:

Last engine tune-up:

Last Degraded parts change:

6. PSW Priority Vehicle Inspection Summary (for 4W/REN/WIP for Toyota GE)

Category	Ok	Not Ok	Remarks
(A) Exteriors (Physical and Paint Condition)			
Body panel condition			
Body panel paint condition			
Teflon or Ceramic coating condition			
Free of body scratches			
Free of body dents			
Water resistant covers			
Fuel tank condition			
Dashboard / Speedometer condition			
Headlights focus/condition			
Taillights condition			
Indicators condition			
Brake lights condition			
Clutch condition (?4W/REN)			
Horn condition			
Choke condition			
Self-start condition			
Mirrors condition			
Accelerator/Brake pedal condition			
Crashworthiness condition			
(B) Steering			
Vehicle does not drift to one side without prodding			

Vehicle is stable no shaking or vibrating			
No resistance in steering handle when turning			
No clicking or clanking when turning			
(C) Suspension			
Vehicle rests levelly			
When bouncing the tyres/wheels no creaking noises are heard			
Both tyres/wheels respond the same on bouncing			
(D) Brakes			
Vehicle steers straight and does not pull to one side when applying brakes			
No grinding noises when applying brakes			
Wheels do not lock when applying anti-brake system (if applicable)			
Brakes functioning Front & Rear			
(E) Tyres			
Tyres are of a reputable brand			
Tyres are of the same make			
Tyres are free of any cuts, bubbles or cracks			
Tyres are worn evenly (uneven wear can indicate alignment and suspension problems)			
Spare tyre condition good (if applicable)			
(F) Frame			
Chassis is neither bent nor cracked			
Axle is neither bent nor cracked			
No expected degradation of Axle			
No signs of metal crumbling			
Frame condition is good			
(G) Interiors			
Seat unworn and free of cracks			
All gauges work			
No dashboard warning lights (remain illuminated)			
(H) Engine			
Mileage			
Vibration/Smooth running			
Free of oil or fluid leaks			
Free of odours when engine is running			
Exhaust pipe emissions are neither blue (indicates the engine burns oil) nor black (excessive oil consumption)			
Oil filler neck not coated with thick, black deposits			
Timing Chain/Belt condition			
Battery condition			
Battery terminals free of corrosion			
Battery Management System condition			
(I) Manual or standard transmission			
Each gear shifts smoothly			
Clutch works smoothly			

Clutch cable condition			
Adjustment / Other Clutch issues			
(J) Automatic transmission			
Transmission fluid looks clean, not dirty nor gritty (indicating no internal transmission problem)			
Transmission neither slips or delays while driving			

7. Screenable PSW priority/primary aspects of the Vehicle Job Card

Vehicle Tag No   **Job Card No**

Priority Identification

Remarks

IN Date:	IN Time	OUT Date:	OUT Time:
LAST LAP/DISTANCE Date:		**EXPECTED NEXT LAP/DISTANCE Time**	

Vehicle Reg No	
Make	
Type	
Year/Model	
Colour	
Engine No	
Frame No	
Date of sale	
Speedometer/Kms run	
Key No	
Petrol/Diesel/Electric/Hybrid	
PSW Fitness Rating	
Owned/Brand Enhanced/ Referral vehicle	

Fuel Level:

QCDES / Crash worthiness Condition of vehicle:

Next PSW Service Follow up: **Date:**

Laps/Distance covered: **L/D Remaining:**   **Dead stop/ Lapse:**

Instructions as per PSW Service Activity Planner

Due Noteworthy PSW Details

Labor details/ Time spent	
Engine	
Parts	
Degradable Parts	
Electricals	
Lubricants	
Exhaust decarb level/ replacement	
Emission Check	
Stock/Spares used in services	
Stock/Spares used in repairs	
Stock/Spares not available / work pending	

PSW Final Inspection (FI) Register (as followed)

Column Name	**Details**
Date/Time	
PSW Job Card Number	
Vehicle Number	
Model	
Variant	
PSW Technician Name(s)	
QCDES Fitness Score	
Problems identified	
Planned Maintenance	
Preventive Maintenance	
Corrective / Counter Measures Taken	
PSW Entry Time	
Remarks	
PSW Exit Time	
Final Inspection done by	
Final Inspection signature	

8. Laps/Distance travelled for PSW Service Schedule

Kilometers travelled/date/time	Type of PSW service	Remarks/ Refer checklist
Sector 1 / Laps covered	☐ D2P Accentuation service ☐ PSW service	
Sector 2 / Laps covered	☐ D2P Accentuation service ☐ PSW service	
Sector 3/ Laps covered	☐ D2P Accentuation service ☐ PSW service	
Sector 1/Laps remaining	☐ D2P Accentuation service ☐ PSW service ☐ Degradation Noting	
Sector 2/Laps remaining	☐ D2P Accentuation service ☐ PSW service ☐ Degradation Noting	
Sector 3/Laps remaining	☐ D2P Accentuation service ☐ PSW service ☐ Degradation Noting	
Total distance covered kms	☐ D2P Accentuation service ☐ PSW service ☐ Degradation Noting	
Total distance remaining kms	☐ D2P Accentuation service ☐ PSW service ☐ Degradation Noting	

Most BRAND EXPERIINCE ANALYTICS provide

Dedicated Performance/Maintenance/Repair/Tuning Advisories after laps/sectors or during the rally/race/event. D2P Accentuation is a NEXT step.

9. PSW Service Activity Checklist for types of services

Nature of activity	Details	Remarks
☐ Engine oil level	Check and refill if necessary	
☐ Air filter element	Clean thoroughly	
☐ Fuel line pipe leakage	Check and inspect	
☐ Clutch Lever Play	Check and adjust if necessary	
☐ Brake Level Play	Check and adjust if necessary	
☐ Gear Box oil	Check and refill if necessary	
☐ U-Joints and slip joints	Check and lubricate	
☐ Tyres and Tyre Pressure	Check the condition and fill air if necessary	
☐ Brake fluid	Check and refill if necessary	
☐ Brake liners/pads	Check condition	
☐ Brake disc	Check condition	
☐ Brake drum and lining	Check condition	
☐ Suspension front and rear	Check	
☐ Battery electrolyte	Check and top up if necessary	
☐ Entire electricity cables and connections	Check	
☐ Axle service	Check bump sensitivity Check for bend Check for degradation	
☐ Spark plugs (if applicable)	Check gap, clog and clean	
☐ Carburettor (if applicable)	Check, clean and adjust air/fuel mixture	
☐ Fuel injection system	Check for symptoms and service	
☐ Exhaust system	Check and clean if necessary	
☐ Wheels	Check condition, wear and replace if necessary	
☐ Wheel bearing	Check assembly condition and replace if necessary	
☐ Steering bearing	Check assembly condition and replace if necessary	
☐ Timing Chain / Belt (if applicable)	Check slack, alignment, condition, clean and lubricate as necessary	

☐ Nuts and bolts	Check for looseness, condition, tighten or replace as necessary	
☐ Valve system based on number of cylinders	Valve seat servicing, lapping, tappet clearance,	
☐ Optional parts as identified by the brand/dealer	Check condition	
☐ Accessory list as identified by the brand/dealer	Check condition	
☐ Gross weight of vehicle related QCDES fitness	Condition for rest of rally/race/event	

10. New technology and panelling

OBD2 compliance as in safer commuting

The Government of India has mandated the OBD2-compliant engine for two-wheelers in India.

On-board diagnostics (OBD) refers to the automotive electronic system that provides vehicle self-diagnosis and reporting capabilities for repair technicians.

The latest version of the On-board Diagnostics System (OBD2-A) helps in detecting system failure by illuminating the console lights in case of a fault in the vehicle.

The OBD2 system provides trouble codes or fault codes that are stored by the on-board computer diagnostic system, these codes are stored in response to a problem found.

The expectation from a service technician

The codes can be read by a code reader or OBD2 software. The OBD2 Diagnostic Trouble Codes (DTCs) are 5-digit alphanumeric codes that are standardized and used as a common code list.

(A)

B – Body code

C – Chassis code

P – Power train codes (engine and transmission)

U – Network code (wiring bus)

(B)

G – Generic code

I – Vehicle Manufacturer Special Code

(C)

1 – Fuel and Air metering

2 - Fuel and Air metering (injector circuit)

3 – Ignition System or Misfire

4 – Auxiliary Emission Control

5 – Vehicle Speed Control and Idle Control System

6 – Computer Output Circuit

7 - Transmission

8 – Transmission

(D)

XX – Fault description

P – Power train codes

P0xxx: Character in the code identifies the system in which the fault has occurred

1 and 2: Fuel or air metering problems

3 – Ignition or engine misfire

4 – Auxiliary emission controls

5 – Idle speed control problems

6 – computer or output circuit faults

7 and 8 – Transmission problems

Non-powertrain codes

Bxxxx, Cxxxx, Uxxxx – ABS etc needing to be retrieved using a datalink connector

P1xxx: Manufacturer specific codes that do not include emissions and may not cause the engine light to turn on

PSW and Workshop RemoteLink (Highlight of vehicle maintenance systems)

1. A reactive maintenance strategy results in the reduction of the lifetime of a vehicle and also adds expense or costs in maintaining and using a vehicle.

2. Predictive maintenance helps overcome this issue.

3. Among the different types of maintenance

(a) Preventive maintenance is performed after a fault has occurred. It is used for infrequent failures and for parts upgradation

(b) Corrective maintenance is performed as breakdown maintenance

© Predictive maintenance uses the analysis of the current condition of the vehicle to predict a failure

4. For vehicle health monitoring the typical mechatronic systems and subsystems are

(a) Engine (b) Gearbox (c) Brakes (d) Ignition (e) Fuel injection (f) Emission (g) Cooling (h) Battery (i) Sensors (j) Actuators (k) Other subsystems associated with electromechanical processes

5. Engine Control Unit (ECU) controls sensors and actuators to screen and diagnose faults or problems

The ECU is also associated with the Controller Area Network (CAN) through which a distinctive subsystem and driver communicate with each other

ECU communication is done via a high-level diagnostic protocol i.e the OBD2 and UDS

The OBD2 protocol allows the vehicle to diagnose and self-report codes

The OBD framework allows a vehicle owner or repair professional to access diagnostic data about the current condition of the subsystems

The UDS provides specific details

Thereon system maintenance is done via a diagnostic and prognostic ability related to the current state and futuristic state of the system or subsystem

6. Remote health monitoring involves the monitoring of different systems and subsystems remotely and using prognostics/datasets to predict degraded performance or faults in advance

7. Sequential Pattern Learning Algorithm – the algorithm learns patterns from waraanty data of the vehicle and converts these patterns to a rule based expert system that helps diagnose conditions or use fault patterns

8. COSMO (Consensus self-organized models for fault detection) helps increase vehicle and parts/systems lifetimes

9. BRACID (Bottom up induction of rules and cases for imbalanced data) to deal with imbalanced data via learning classifiers

10. Kalman model to monitor vehicle health via sensor data for fault prediction and engine abnormal behavior via anomaly detection

11. Least Square Support Vector Machine (SVM) classifier for diagnostics and remote prognostics

12. Predictive maintenance via the sse of a vehicle database for storing maintenance records of vehicles visiting a workshop

13. vehicle monitoring system that monitors driver activity and status of engine via SMART phones for communications between the vehicle and back end server

14. Comprehensive analysis of vehicle's on-board and off-board data using supervised and unsupervised learning techniques using a telematics gateway

15. Multi-sensor fusion technique that monitors vehicle health using oil data and vibration signals

16. VMMS – A real time vehicle monitoring and fault prediction system , which diagnoses main subsystems such as (a) Ignition (b) Exhaust (c) Fuel injection (d) Cooling and Other mechatronic subsystems

It uses machine learning techniques such as Decision tree, Support Vecotr Machine, K-Nearest Neighbor and Random Forest

It uses a D2P Accentuator, SMART Phone App, OBD scanner, Bluetooth protocol to communicate DTC from scanner to D2P Accentuator / SMART Phone and wireless mobile data communication from D2P Accentuator / SMART Phone to the back-end server

It uses a classification algorithm for pattern learning

It relies on push notifications of abnormal condition via D2P Accentuator / SMART Phone alerts or emails

17. The cost constraints in using sensor data based systems is the need for large memory space, high processor speed and custom made D2P Accentuators / SMART Phone Apps

A possible VMMS architecture (public domain case study)

The design of the VMMS architecture involves 3 levels that is the data generation level, the data processing level and the feature based decision making level.

Data generation level

In the first level, data is generated. An OBD2 scanner is connected with the vehicle through a OBD2 port

As a microcontroller an ELM327 Bluetooth unit can be used

The OBD2 scanner will behave like a bridge between the vehicle and the portable device which can be a SMART phone or laptop that supports Bluetooth communications

Data will be continuously generated in the form of DTCs when the vehicle is running or on the move and sent to the portable device via Bluetooth

The data from the D2P Accentuator / SMART phone is sent to the back end server

Data processing level

In the data processing level, the first step is feature selection where a data stream containing DTCs is filtered using Principal Component Analysis (PCA)

After PCA the other classification algorithms could be from options such as Decision tree, Random forest, K-nearest neighbor, and Support Vector Machined which can be used to learn interesting patterns of DTCs

This can be stored at the server end or back end for fault prediction and remote monitoring of the vehicle

Decision making level
Via remote monitoring the vehicle owner/user/technician or automobile professional can monitor the current status of the vehicle such as (a) fuel status (b) speed/time elapsed (c) current position

Any failure or abnormal condition can be reported automatically to the vehicle owner/user/technician

Thus VMMS proposals can increase the lifetime of the vehicle and its parts or systems.

VMMS proposals can also reduce the risk level of using a vehicle with faults or problems

An Engine Control Unit (ECU) also is part of the VMMS architecture as sensors report their fault information to it

The ECU adjusts quickly to manage the condition or confine the condition reported using programmed maps in the memory unit

The OBD2 scanner can download the onboard DTCs by communicating with the ECU Zto thereon determine via the DTCs whether any sensors are not working properly

In the proposal the ELM327 can display more than 1500 values of sensor data where a sampling frequency of typically 1 Hz helps get a stream of DTCs from the vehicle's sensors while it is running or on the move

According to the feature set algorithm, a selected feature set will be represented by a binary value of 1 for DTC diagnosis or will be represented as 0 if the feature is not selected

The output condition or class label will be set to 0 if the associated vehicle condition is functioning ok or will be set to 1 if the associated vehicle condition is experiencing a failure or abnormal condition

Here in the interest to know more about machine learning algorithms

Principal Component Analysis or PCA is used to prioritize the feature selected based on variance and standard deviation calculations

Decision Tree algorithms are generally applied using the Gini Diversity index for the right splitting criteria of the data stream where an instance of a feature set's class label belongs to class 0 or class 1

Support Vector Machine or SVM is used commonly to separate the instances of the classes and the classified test instance by ability to measure the separation line or marginal difference between the 2 sides of data indicating a normal or abnormal diagnosis

Radial Basis Function Kernel can be used for similarity measure

K-NN can be used when the Euclidian distance measure is used to calculate the similarity of distance with a present number of neighbors

Random Forest the ensemble bagging learning method can be used to improve the accuracy

For each vehicle system or subsystem like (a) Ignition (b) Fuel system (c) Exhaust (d) Cooling the machine learning algorithm can compute variables such as Precision, Recall, F1 score and Accuracy to determine whether the methodology used is better than other approaches

The formulae used can be as follows

Precision (P) = TP / (TP + FP)

Recall (R) = TP / (TP + FN)

F1 SCORE = (2 * P * R) / (P +R)

Accuracy = (TP+TN) / (TP + TN + FP + FN)

Here
TP stands for True positive
TN stands for True negative
FP stands for False positive
FN stands for False negative

"Optimizing the maintenance schedule for a rally fleet"

This review can help the PSW / Workshop use the official PSW Service Schedule chart and added calculations to decide the maintenance schedule for rally fleet investors participating with multiple same brand & same specifications vehicles in terms of PSW functions, PSW clearances, [SW stock/spares/inventory estimations/expectations or their delivery, transportation, and dependency on rally/race/event specific utility services.

As maintenance is mostly a reactive strategy for a fleet owned by a brand investor or customer, we find certain aspects are important such as

(a) Predicting of remaining useful lifetimes of vehicles and their parts/ components

(b) Assessing the effect of remaining useful lifetimes on the cost of repairs or replacements

(c) Considerations of the safety of using a vehicle whose parts/ components need periodic maintenance

(d) Optimization of the maintenance schedule of the fleet to support objectives such as
(1) reduced expenses
(2) efficient resource utilization
(3) consistent service delivery via the fleet
(4) reduced carbon footprint
(5) high-performance experience in racing or creating value for the brand

For optimizing a maintenance schedule, it is important to acknowledge that each vehicle has certain parts or components that have to be maintained in a predictive and/or preventive manner based on their respective damage from wear & tear and subsequent reduction in remaining useful lifetimes.

To optimize maintenance schedules, the common practice is to use Multi- objective Evolutionary Algorithms (MOEA) to find the Pareto optimal set of schedules

To understand this better, in order to predict or heuristically-schedule maintenance, such an algorithm must
(1) identify the usage of the vehicle and driving tasks
(2) use a rolling time window horizon to predict the remaining useful lifetimes of parts or components
(3) minimize process changes between the previous maintenance schedule and the next
(4) help maintenance-specific estimation, spares management, and other service analytics

From the PSW's or Workshop's point of view, the considerations that matter are
(1) maintenance estimation
(2) fixed setup costs and fixed schedule costs
(3) preparation of the PSW/Workshop for the nature of work
(4) resource allocation for the rally/race/sector's lap workload or total workload
(5) spares (availability) management to control the expected number of failures or faults that the fleet of vehicles may experience on the road
(6) optimization of the next maintenance schedule to reduce or control maintenance costs and workload

A real-time concern is that from the time a maintenance schedule is released for a vehicle fleet, continuous changes could occur to
(1) the vehicle condition
(2) prediction of the remaining useful lifetimes of the parts or components
(3) responsiveness of the maintenance schedule and its objectives of meeting the Drive to Performance / Drive Performance Dimensioning effectiveness
(4) cost variance in terms of setup costs, maintenance/repair/tuning costs and penalty costs

Here penalty costs are based on the assumption that
(1) if a part or component is serviced before it's due date the penalty cost is equal to the full maintenance costs
(2) if the component is serviced on the due date/at the right time, the penalty costs are zero
(3) if the component is serviced after the due date/right time, failure expectation increases to lead to selective parts replacement or upgradation where the working out of penalty costs will need to add lead/lag issues and spares costs too

Highlight of degradation seen in a vehicle
Reference: Vehicle Inspection methodology reviewed previously
(1) Degradation in the oil filter and/or air filter

(2) Degradation in the performance of suspension and springs

(3) Degradation of brake pads

(4) Degradation of tyres

(5) Degradation of axle and it's stability

(6) Degradation of engine

(7) Degradation of the manual gear system or automatic transmission

(8) Degradation in vehicle's ingress protection from dust and water

For optimizing maintenance schedules, vehicle inspection status and estimation of damage or degradation is known to help.

Here degradation of components (numbered 2, 3, 4, 5, and 6) can be calculated based on physical condition (or wear and tear) but in case of components (numbered 1 and 7) degradation occurs due to lack of periodic counter measures (or preventive maintenance).

Degradation of the engine
The estimation of the lifetime of the engine consumed can be done by $de_i = C_{engine} \times R_i \times \Delta d_i$, where C_{engine} is the engine quality constant, R_i the engine rotation speed corresponding to the travel interval and Δd_i is the vehicle travel interval. The % of the engine lifetime consumed can be estimated by $de = \Sigma\, de_i \times 100\%$ (for i =1 to n), where the engine needs to be maintained if the estimated de value is equal to 1

Degradation in the performance of suspension and springs

Fatigue reduces the lifetime of a helical spring and can be analyzed via the S-N Curve, where S is the cyclic stress amplitude and N is the number of cycles

Calculations that help $S = K \times (8 \times F \times D_{coil}) / (\pi \times d^3_{wire})$

Here K is the Wahl factor given by $K = 1 + (0.5)/C$

C is the spring index where $C = D_{coil}/d_{wire}$

D_{coil} – mean diameter of coil

d_{wire} – mean diameter of wire. According to Paris-Erdogan and Palmgrem-Miner laws, the % damage for the spring is given by $d_s = \Sigma n_i/N_i \times 100\%$ (for i =1 to p), where

d_s = Total percentage of life consumed

p = total number of stress sources

n_i – number of cycles with stress amplitude

N_i – number of cycles to failure at this stress

n_i/N_i - fractional damage due to the ith source

if $d_s >= 100\%$, then spring's lifetime ends and a spring failure occurs

Degradation of brake pads

In the process of braking, due to the friction between the surfaces of the friction couple parts, the zones of contact are damaged after each braking event resulting in worn-out material. The volume of worn-out material of the ith braking event can be represented as

$\Delta V_{bi} = C_{brake} \times F_i \times \Delta d_i$, where C_{brake} is the brake pad quality constant, F_i is the friction force and Δd_i is the relative displacement between the brake pad and the brake system rotor of the ith braking event. The % of the brake pad damaged can be estimated by

$d_b = \Sigma \Delta V_{bi} /V_{b0} \times 100\%$ (for i =1 to n), where V_{b0} is the maximum volume by which the brake pad can experience wear and tear before a failure can occur

Brake force can be calculated by dividing the brake torque by the length of the level arm

Degradation of tyres

Wear of the tyres occur when the tyre surfaces are in contact with the road surface where the friction results in worn out material. The volume reduction of a tyre due to worn out material is calculated by $\Delta V_{ti} = C_{tyre} \times (|F_x| + |F_y|) \times \Delta d_i$, where C_{tyre} is the tyre quality constant, F_x & F_y is the horizontal components of the friction force and Δd_i is the relative displacement between the tyre surface and the road surface or simply the wheel's distance travelled. The % of the tyre damaged can be estimated by

$d_t = \Sigma \Delta V_{ti} /V_{t0} \times 100\%$ (for i =1 to n), where V_{t0} is the maximum volume by which the tyre can experience wear and tear before a failure can occur

We now proceed to review how Remaining useful lifetime (RUL) calculations can be done

Proposal for RUL calculations

RUL prediction is usually done by extrapolating the future damage due to the current condition and/or lack of counter-measures.

Workload for a vehicle participating in a rally/race/event/sector/lap =
(1) DPD Experience assessment and management of the vehicle condition
(2) QCDES Scorecard assessment and management of the vehicle condition
(3) Estimated versus Actual Sector/Lap/Distance coverage
(4) Estimated Drive experience versus Actual Driver/Co-driver experience
(5) prediction of the remaining useful lifetimes of the parts or components
(6) responsiveness of the maintenance schedule and its objectives of meeting the Drive to Performance / Drive Performance Dimensioning effectiveness
(7) cost variance in terms of PSW/Workshop setup costs, maintenance/repair/tuning costs and penalty costs

If RUL is estimated in units of 1 estimated workload experience, then the Total % damaged after the wth workload experience is

$$D = \Sigma D_i \ (\text{ for } i = 1 \text{ to } w)$$

Here D_i = Total % damaged after ith workload for the rally/race/event expected/day/lap/distance completion

Total RUL after the (wth workload) can be calculated using the formula
$$RUL = (100\% - D) / (D/w)$$

But lack of counter measures or aging can add some variance, thus we calculate the lower bounds (-) and upper bounds (+) of RUL

$$RUL(-) = (100\% - D) / (D/w + Alpha)$$

$$RUL(+) = (100\% - D) / (D/w - Alpha)$$

Here Alpha (α) is the standard deviation function

Again it is expected that the maintenance schedule of certain components (like the list reviewed earlier) helps optimization of the maintenance schedule & real-world expectations of "RUL" as the window of the need for maintenance of certain parts or components may or may not overlap.

As the proposal expects to deliver for the D2P/DPD vision, innovating for more implied improvements in the standard deviation function will help.

We find the standard deviation function can be decided by a stability criterion that can be calculated via a D2P Accentuator dashboard that includes information of
(1) teams reporting or not reporting multiple instances of problems with specific parts or components

(2) teams reporting or not reporting negative feedback about vehicle maintenance or vehicle performance

The D2P Accentuator dashboard can be used to design Alpha (the standard deviation function) and the stability criterion based on the following estimations

Awarding + 0.1/- 0.1 for (a) positive, or negative feedback, (b) positive, or negative rating of vehicle safety, (c) positive, or negative rating of vehicle quality and (d) positive, or negative rating of customer experience

This gives a range for Alpha and the stability criterion as
$-0.4 <= \text{Alpha} (\alpha) <= 0.4$

Work in progress - Template only