Optimisation of vehicles’ reliability and maintainability

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Background

- Protection of personal data (GDPR)
- Reliability and maintainability optimisation
- Customer satisfaction
- Numerous and various databases available
- Complex system: 6000 components

Aims

- Design (PSA)
- Post-sale (PSA)
- Post-sale (Customer)

Methods

<table>
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<tr>
<th>Issue</th>
<th>Data</th>
<th>Method</th>
<th>Results</th>
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</thead>
<tbody>
<tr>
<td>1. Selection of the components to take into account</td>
<td>Which are the less reliable components? Which are the most urgent cases?</td>
<td>BIA and NAVIG data from vehicles in circulation</td>
<td>Statistical treatment</td>
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<td>2. Identification of components that are reliable or modifiable</td>
<td>How and when quantify or qualify the indicators for each component? How to interpolate between two discrete values?</td>
<td>Based on other vehicles: Now - STA unit. After 2000 - D5F unit based on the same car: SPARIL database, during validation phase ( \text{HIA unit, when customer drives} )</td>
<td>Group of methods to deal with qualitative and quantitative data in small or high quantity + Integrate uncertainties</td>
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<td>3. Elaboration of a maintenance strategy</td>
<td>Influence of failure on the other parts</td>
<td>Direct and indirect maintenance costs Residual performance</td>
<td>Test and simulation of various maintenance strategies + Sensitivity analysis</td>
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Results

- PSA databases:
  - Identification completed
  - Links established
  - Description completed
  - Classification in progress
- Data treatment methods:
  - Identification completed
  - Description in progress
  - Comparison in progress
- First year objectives:
  - Understand databases and treatment methods,
  - Select the most adapted « data ↔ method » couples

Conclusion

- Databases are known and understood
- Data treatment methods are identified, descriptions are in progress

Perspectives

- Use the acquired knowledge to develop the methodology of optimisation of vehicles’ reliability and maintainability

Bibliography