Improved spare parts inventory control for component repairs at Fokker Services

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Joint work with Twan Dollevoet

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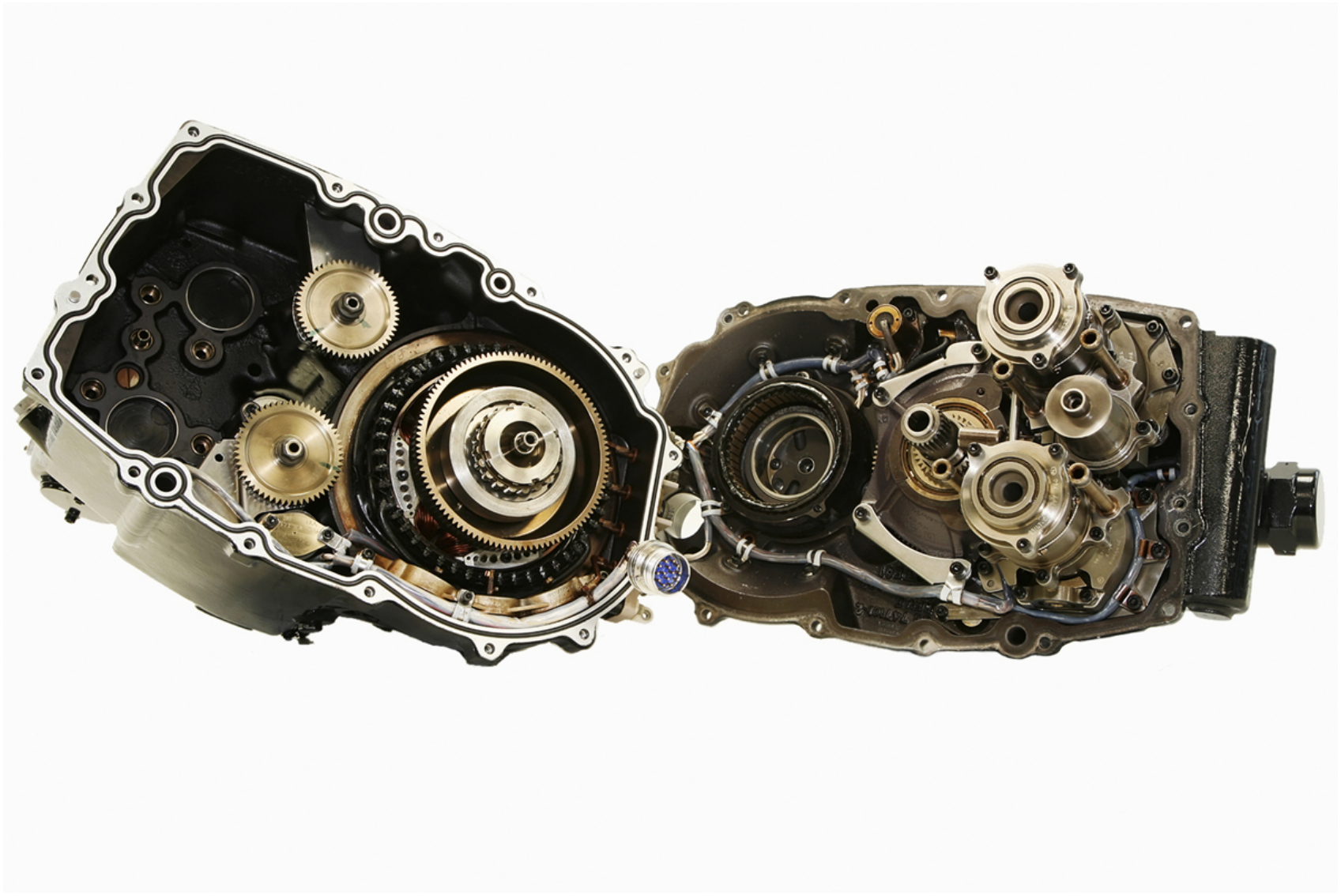
Aircraft components



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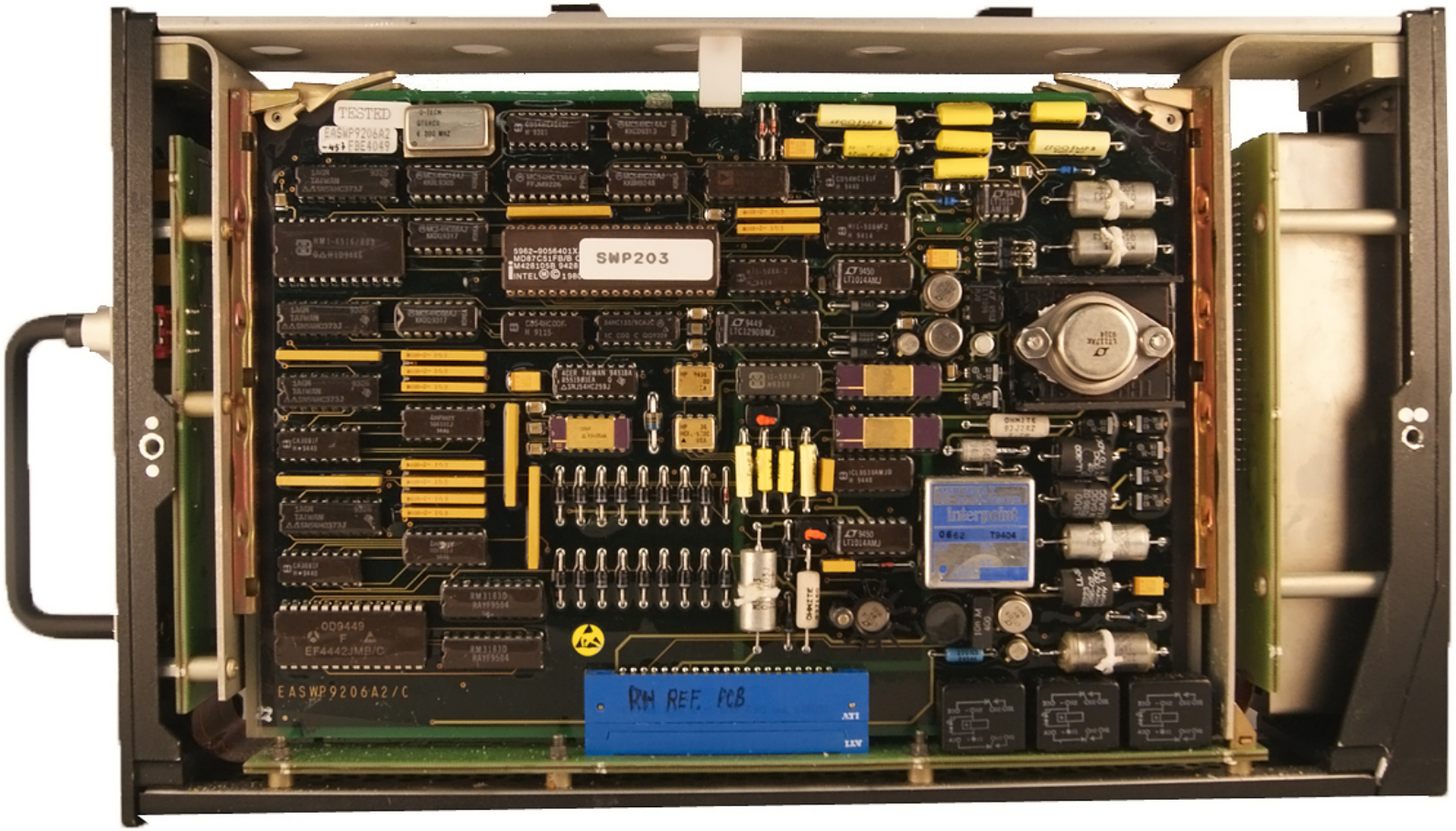

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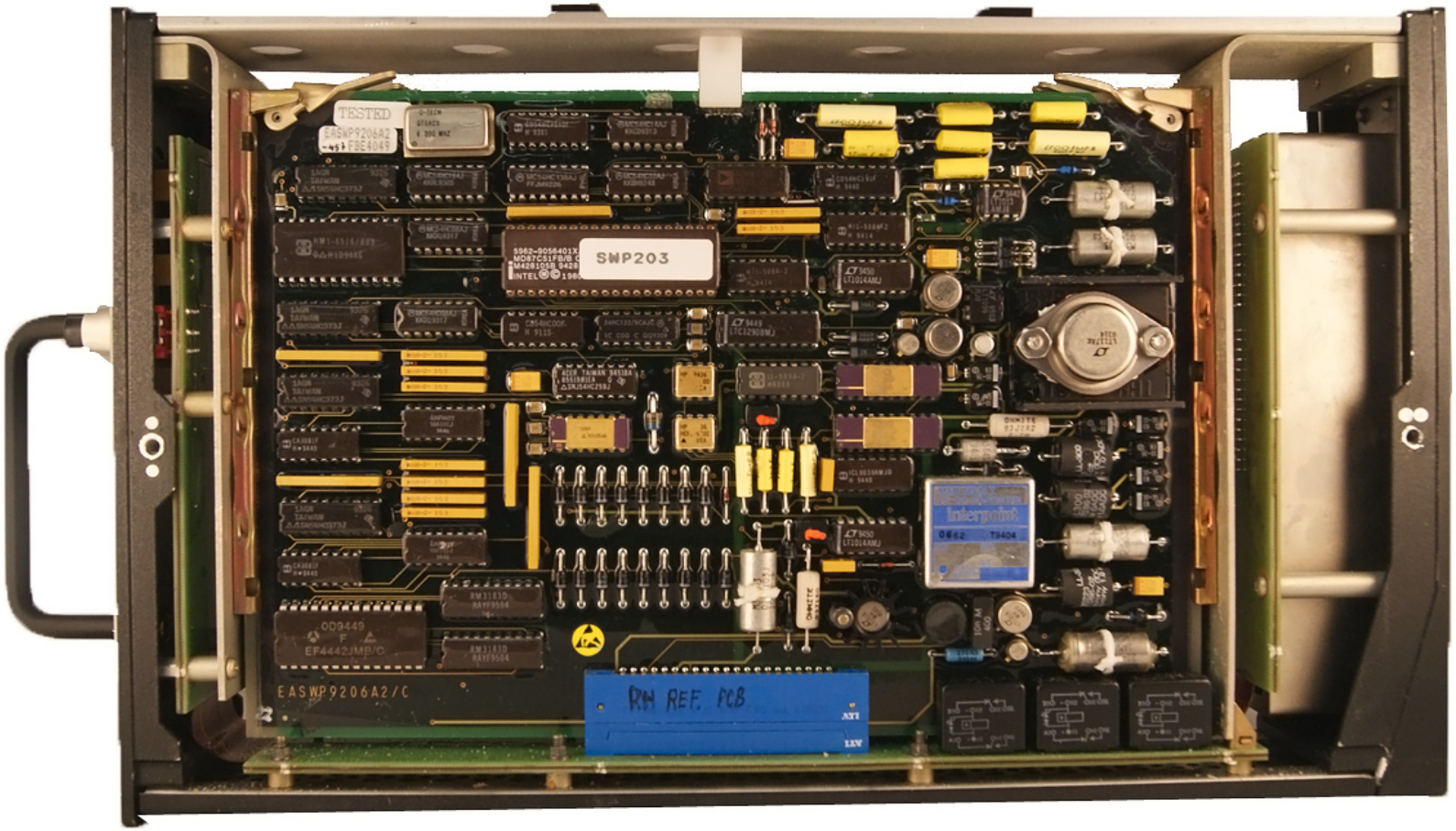
- Maarten van Marle, Managing director: "Short repair turnaround times are very important to our customers when deciding to which repair shop they will outsource their repairs."
- "The most challenging aspect to attain short turn around times is ensuring the timely availability of the spare parts needed in the component repairs,"
- "while keeping inventory costs under control."
- Currently $>$ 10 million euro capital tied up inventory

Spare parts



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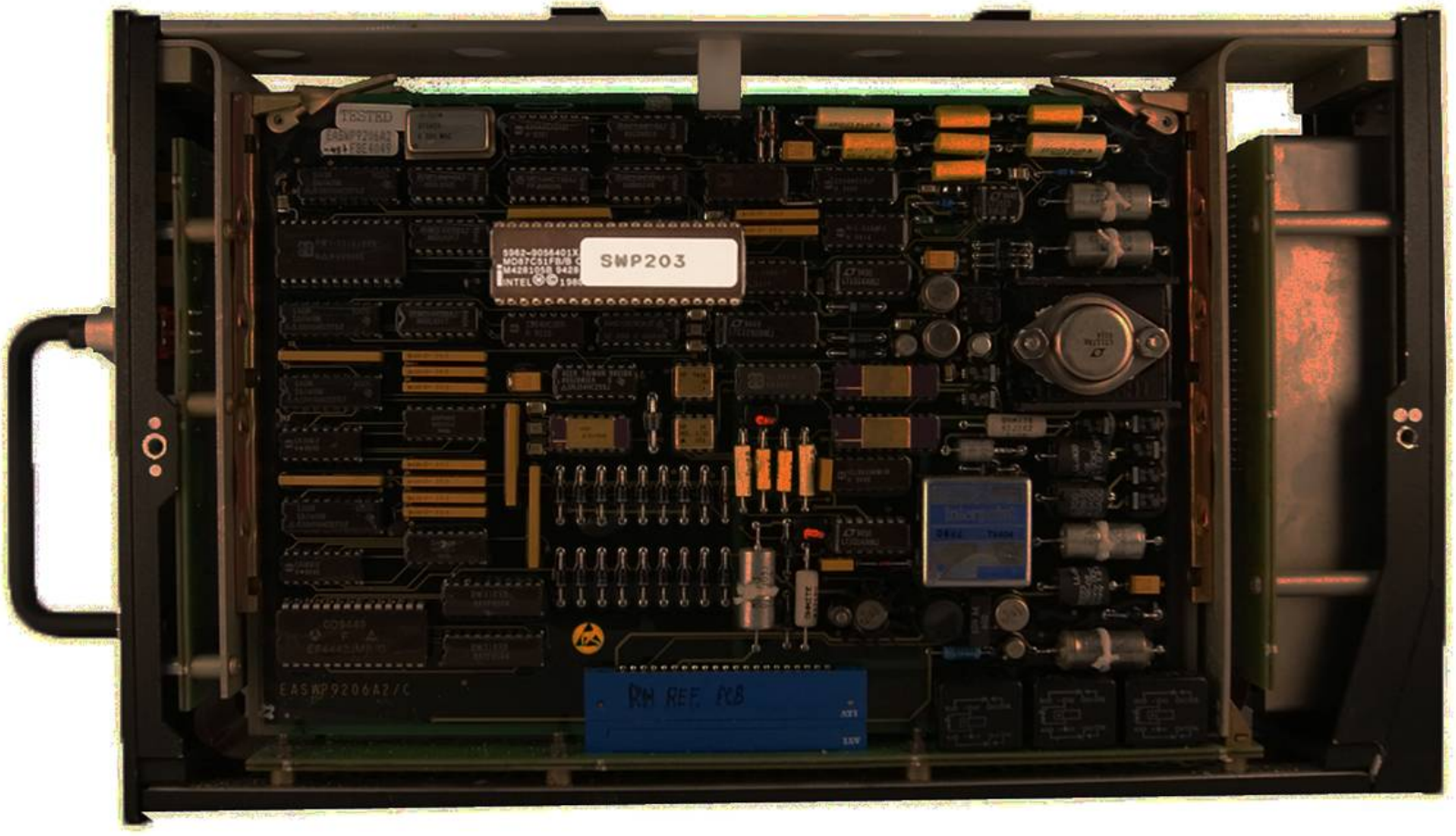

The process

- Customer sends component to shop for repair.
- On arrival, the component is inspected for fault diagnosis.
- This inspection reveals which spare parts are needed for the repair.
- If necessary, parts are ordered.
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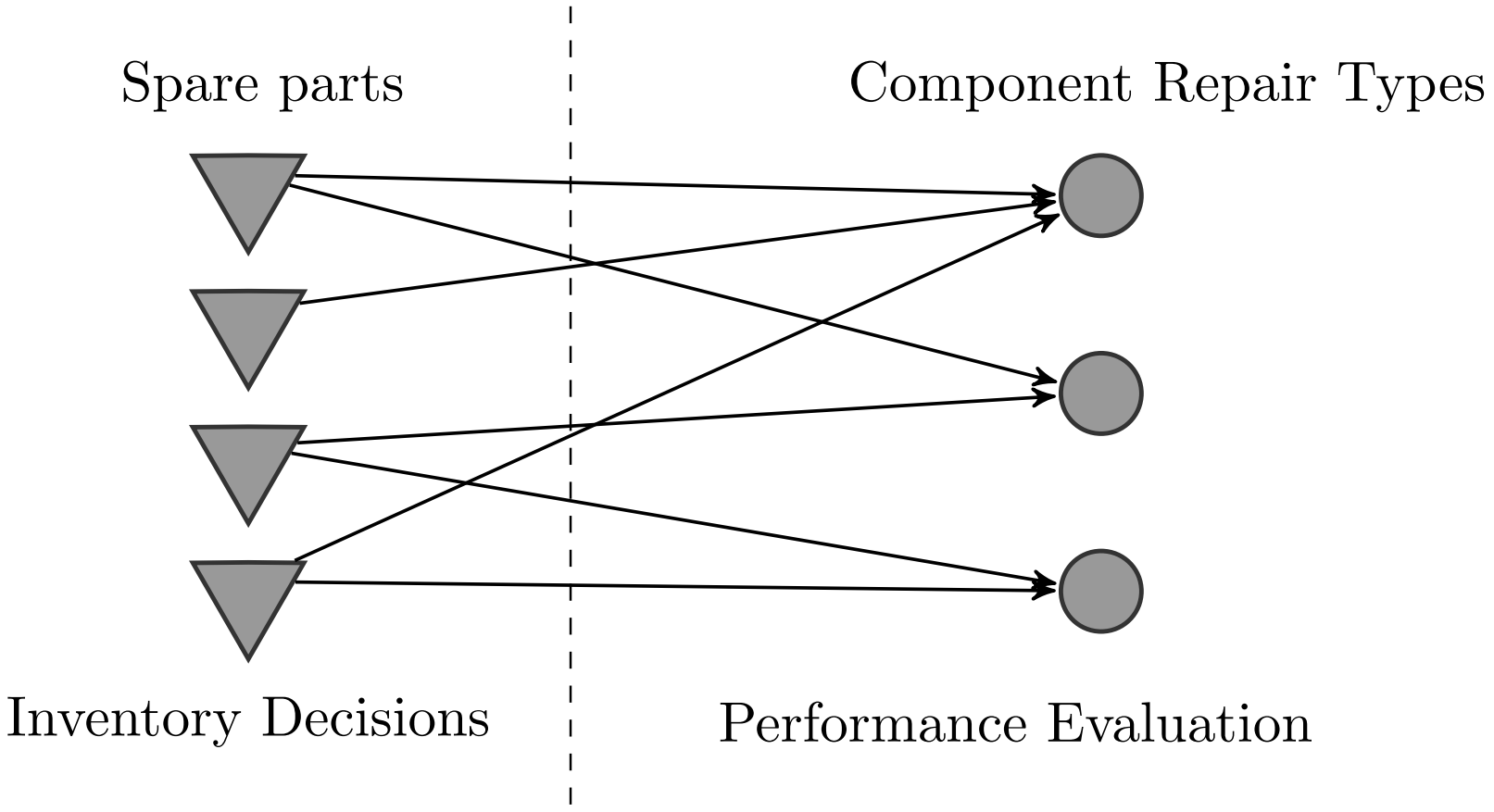
Problem complexity



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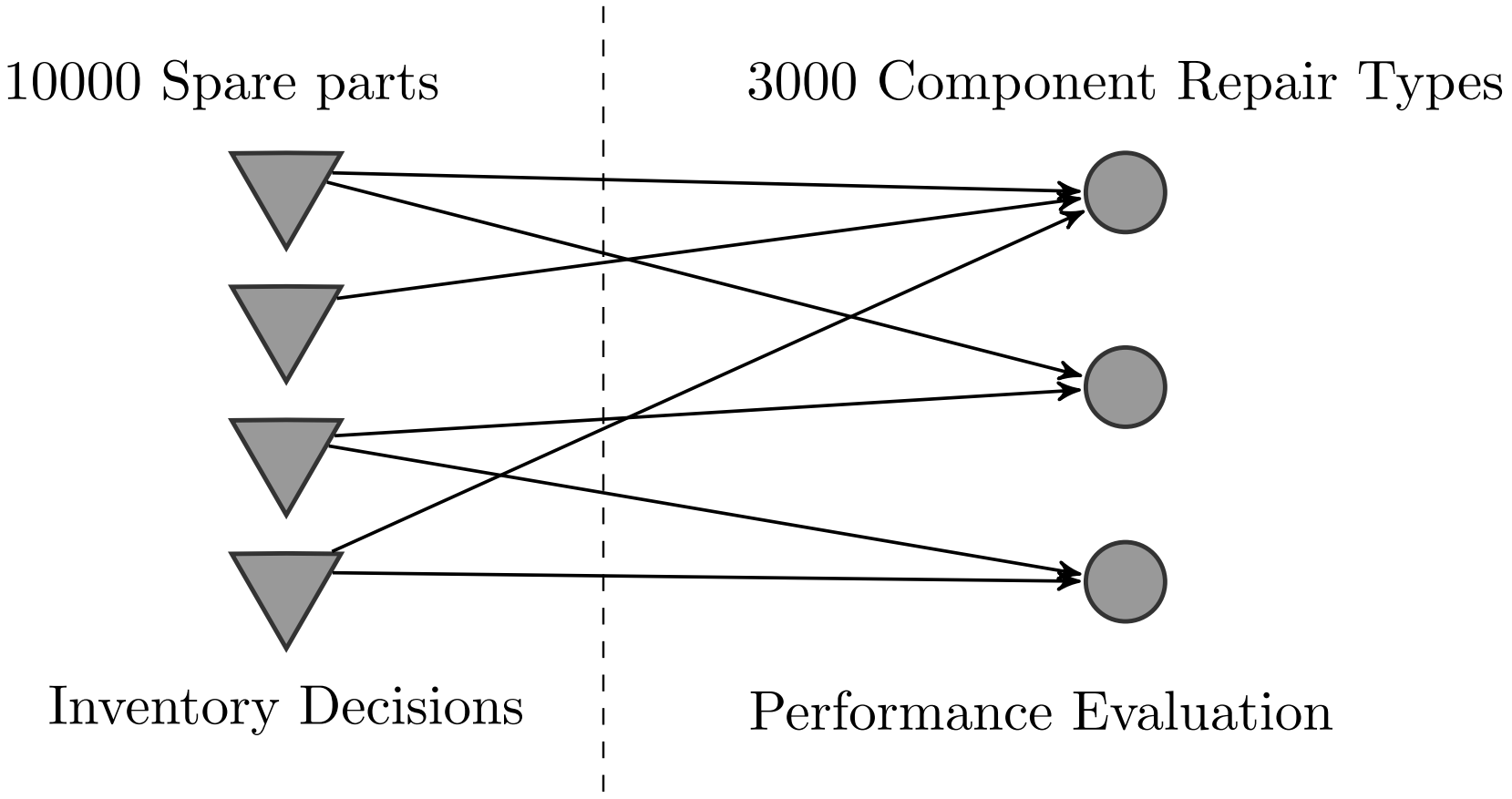

The optimization model

Problem is modeled as stochastic, nonlinear optimization problem:

1. Minimize the total cost, consisting of *i)* holding costs *ii)* ordering costs for all parts;
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3. Such that the availability targets for each component type are attained.
   - e.g. of all repairs done for component type P0KK-1010-021, in at least 85% of the cases all spare parts needed for the repair must be available within 10 days after the repair commences.

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- Implemented in self-developed decision support system: minimum and maximum quantities imported into ERP system.
- Scientific contribution

Results

Maarten van Marle, Managing Director of the repair shop:

- "By using a demand forecast to predict future inventory, the investment is projected to decrease by about 15% compared to current values."
- "[The method] provides the missing link between TAT performance, the goal we want to achieve, and spare parts inventory, the means by which we achieve it."
- "I am confident that the method has a positive impact on sales, as it allows us to better guarantee that we deliver our customers what they expect."