

Maintenance Outsourcing: Maintenance contracts

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Goals for next hour

Provide insight in
a number of relevant issues
related to
outsourcing maintenance
&
their mutual relations.

From *insights* to *decisions*



Topics

1. Outsourcing maintenance: Why?, What?, When?, To whom?
2. Maintenance contracts
3. Case
4. Summary and conclusions

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Education:

- BSc biology (UU)
- MSc Physics (UU)
- PhD Physics (NU)
- MSc IE (TU/e)

Maintenance contracting:

- OEMs: Ricoh, Vanderlande, Weir, Bosch, Philips HealthCare,
- Third Party Maintenance Service Providers: Stork Technical Services
- Asset Owner: VandenBosch

- Maintenance planning & control: incl. AirFrance-KLM, NedTrain, Sabic, DSM, Merck, Heineken, Vlisco, Canon, Ricoh, Vanderlande



Case

- Once in a while a machine breaks down due to a certain problem.
- Question Asset Owner (AO):
Outsource solving problem or do it myself? If outsourcing: which type of contract?
- Question Third Party Maintenance Service Provider (TPMSP):
Go for a certain maintenance contract related to the above problem or not?

1. What does maintenance require?

Issues:

- Maintenance policy (corrective, preventive)
- Planning
- Scheduling
- Actual execution

Resources:

- Men
- Parts
- Tools

1. Why outsourcing?

Focus on core business (production, distribution, ...)

Cheaper

- Cheaper at all
- Better done
- Faster done <> Downtime
- Demand for maintenance

Difficult to get good maintenance people and keep them



1. What to outsource? (1)

| | Policy | Planning | Scheduling | Execution |
|-------|--------|----------|------------|-----------|
| Parts | | | | |
| Men | | | | |
| tools | | | | |
| | | | | |

1. What to outsource? (2)

Units of outsourcing:

Completely vs. partly outsourcing of all maintenance related to one part of an asset, (parts of) assets that influence eachother's functioning

Note: Maintenance activities and how they are executed by one party may have consequences for maintenance activities to be done by other party.

Example:

Execution preventive maintenance by asset owner, corrective by third party

Bad preventive maintenance may result in extra corrective maintenance (extra time, replacements) and vice versa

Consequences outsourcing for work contents own employees



1. When to outsource?

Structural or ad hoc?

Structural:

- Continuously vs. temporarily (e.g. only in case of peaks in demand, illness own maintenance men)

1. To whom to outsource (which TPMSP)?

- Supplier asset (“ETO” asset)
- Other external party

(Compare with cars: dealer vs. other garage)

Note: the actual execution of maintenance may be done by another party than the external party you outsource to <> service triad

2. Maintenance contracts

Some contracts often seen in practice:

- Effort based (e.g. # hours spent on replacing a filter in a production line)
- Activity based (e.g. replacing all filters / one filter in a production line) when necessary
- Downtime / uptime based (e.g. based on number of hours that a production line can not work per year due to problems with filters)

Trend: leasing (“from hardware to function (servitization)”).



2. Maintenance contracts contents (1)

What:

- Which (parts of) which assets
- Maintenance policy, Planning, Scheduling, Execution
- Men, parts, tools, ...

How:

- E.g., minimal repair?
- e.g. parts replacement by new only of a certain brand vs. replacement by used of a certain controllable quality

When:

- Continuously vs. ad hoc



2. Maintenance contracts contents (2)

Responsibilities (some examples):

- availability parts by asset owner
- reaction time maintenance contractor
- timely info about changes in assets (upgrades), replacements asset by other asset using different technology
- good preventive maintenance
- good instructions operators

Performance measurement

- Objective, quantitative criteria
- Consequences of not keeping promises
- Consequences improvements

2. Maintenance contracts contents (3)

Contract period

- (Initial) duration
- Ending contract before end contract
- Changes in content contract

2. Maintenance contracts

Asset owner's point of view

Some uncertainties:

- Does the external party do the jobs it should do? E.g., not unnecessary replacements parts (by new)? (Note: *by determining maintenance policy, asset owner may have some grip ("avoiding" wrong maintenance policy on this).*)
- Does the external party do the jobs that it should do properly?
- Does the external party do the jobs that it should do efficiently (men, parts,...)?
- Do I pay too much at all?
- *Long term availability external party*

2. Maintenance contracts

Third party maintenance service provider's point of view

Some uncertainties:

- Does the asset owner use the asset properly?
- Does the asset owner do the maintenance jobs it should do?
- Does the asset owner do the maintenance jobs that it should do properly?
- When how much of which resources (men, parts, ...) required?
- *Bankruptcy asset owner*

3. Case

- Once in a while a machine breaks down due to a certain problem. The Asset Owner (AO) uses corrective maintenance policy
- Question AO: Outsource solving problem or do it myself? If outsourcing: which type of contract?
- Question Third Party Maintenance Service Provider (TPMSP): Go for a certain maintenance contract related to the above problem or not?
- Focus case: activity based contract.
- Alternative 1: fixed price for solving the above problem each time it occurs
- Alternative 2: fixed price for solving the problem all times it occurs during a certain period.

3. Required data for AO?

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- Expected number of times problem occurs
- Consequences problem for company (downtime cost)
- Direct cost related to solving problem when doing yourself
- Indirect cost related to solving problem when doing yourself
- Direct cost related to solving problem when outsourcing
- Indirect cost related to solving problem when outsourcing.

3. Calculation alternative 1 by AO

AO:

TPMSP:

3. Calculation alternative 2 by AO

AO:

TPMSP:

3. Required data for TPMSP?

3. Required data for TPMSP?

- Expected number of times problem occurs
- **Consequences problem for company (downtime cost).** MAYBE VERY HARD TO ESTIMATE. DIFFERENT FROM PRICE SERVICE PARTS WHERE ALTERNATIVE IS EITHER REPAIR OR BUY NEW COMPLETE SYSTEM.
- Direct cost related to solving problem for AO
- Indirect cost related to solving problem for AO
- Direct cost related to solving problem for TPMSP
- Indirect cost related to solving problem for TPMSP.

3. Calculation alternative 1 by TPMSP

AO:

TPMSP:

3. Calculation alternative 2 by TPMSP

AO:

TPMSP:

3. Alternative execution alternative 2 by TPMSP

Maybe cheaper, *also for AO*, to introduce preventive maintenance (PM), e.g. CBM, block policy, age based policy, load based policy instead of corrective maintenance?

*Crucial issue: When execution PM desired by TPMSP?
When possible/desired by AO?*

4. Summary and conclusions

Conclusions

- Many different interrelated issues
- May be more complex than you may think at first sight

Thank you for being here!
Enjoy the Summerschool!

- Learning effects maintenance outsourcing EJOR first volume in 2009