



**30% more profit by
tackling DOAs**

Costs of DOAs often underestimated

They are high up in the annoyance top 10 of hightech manufacturers: Defects On Arrival (DOAs). Customers who receive defective components are a source of difficult discussions about system availability, service level agreements and claims. Remarkably, DOAs are often not high on the list of priorities of manufacturers. This is despite the fact that tackling this issue can lead to 30% more net profit and higher customer satisfaction.

Preface

Faes is often presented as a 4PL'er. Everyone knows a 4PL'er, they have an integrated control and communication over the entire logistic chain. But how nice it would be if there was one party who could take care of the entire packaging process. Yes, a 4PP, 'Fourth Party Packaging'!

The functionally structured nature of most organisations means that packaging can become a real value drain because no one has overall process responsibility. And this while the strategic importance of a thorough and integral packaging management is only increasing for many companies!

A common packaging issue here is DOA: spare parts for machines or systems, which on arrival turn out not to function - and that while the need of the customer is often high.

In 2013, research was carried out by the University of Groningen in which the three direct costs of DOAs are discussed in detail.

We hereby present you with a study on the fourth aspect, the indirect costs, which was investigated by ten Doesschate in 2014.

We would like to thank the very useful research work of Joris ten Doesschate, under the supervision of Professor W. Alsem.

Introduction

A DOA will reduce customer satisfaction and also damage the efforts of the after-sales service. The presence of DOAs can ruin the relationship between customer and supplier in the long run.

Van Swieten (2013) examined a number of aspects related to the direct costs of Defects-on-Arrival. It was shown that about 2% of the total service parts sold are DOAs, and that the cost of these is 4% of the total turnover of the part. The main conclusion: preventing DOAs can lead to 20% more profit.

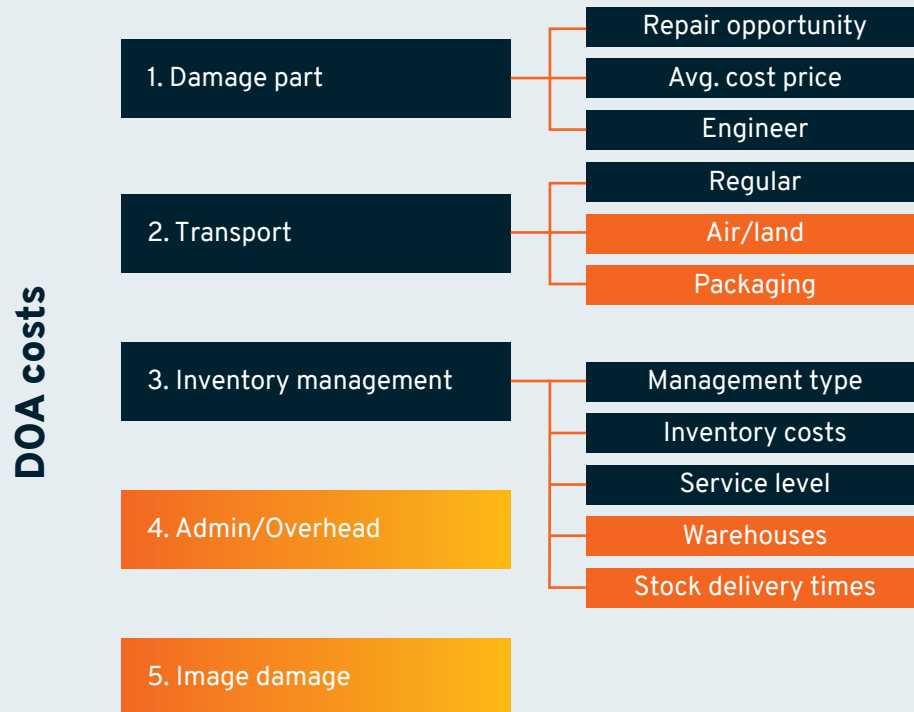
All cost components related to DOAs were qualitatively mapped. In quantitative terms, however, data was lacking for a number of components, so that these could not be included in the cost analysis. The study was only carried out on the direct cost components 'component damage', 'transport' and 'inventory management'. A key underlying conclusion was that improving the packaging process has been shown to lead to major savings and, in particular, logistical DOAs reduced by 50-90%.

In addition, it was concluded that the actual costs related to DOAs are even higher than Van Swieten's conclusions reflected. This statement forms the basis of the follow-up research of ten Doesschate.

DOA?

A component that arrives in a non-functional state at the time of delivery is referred to as a with the term "Defect On Arrival".

Model 1: DOA cost model research 2013



Survey 2013

Request your copy of the research of Van Swieten via info@faes.nl

** The components shown in dark blue were quantified; all components in dark orange (indirect costs) and with gradient were not included in the cost analysis in the 2013 study.*

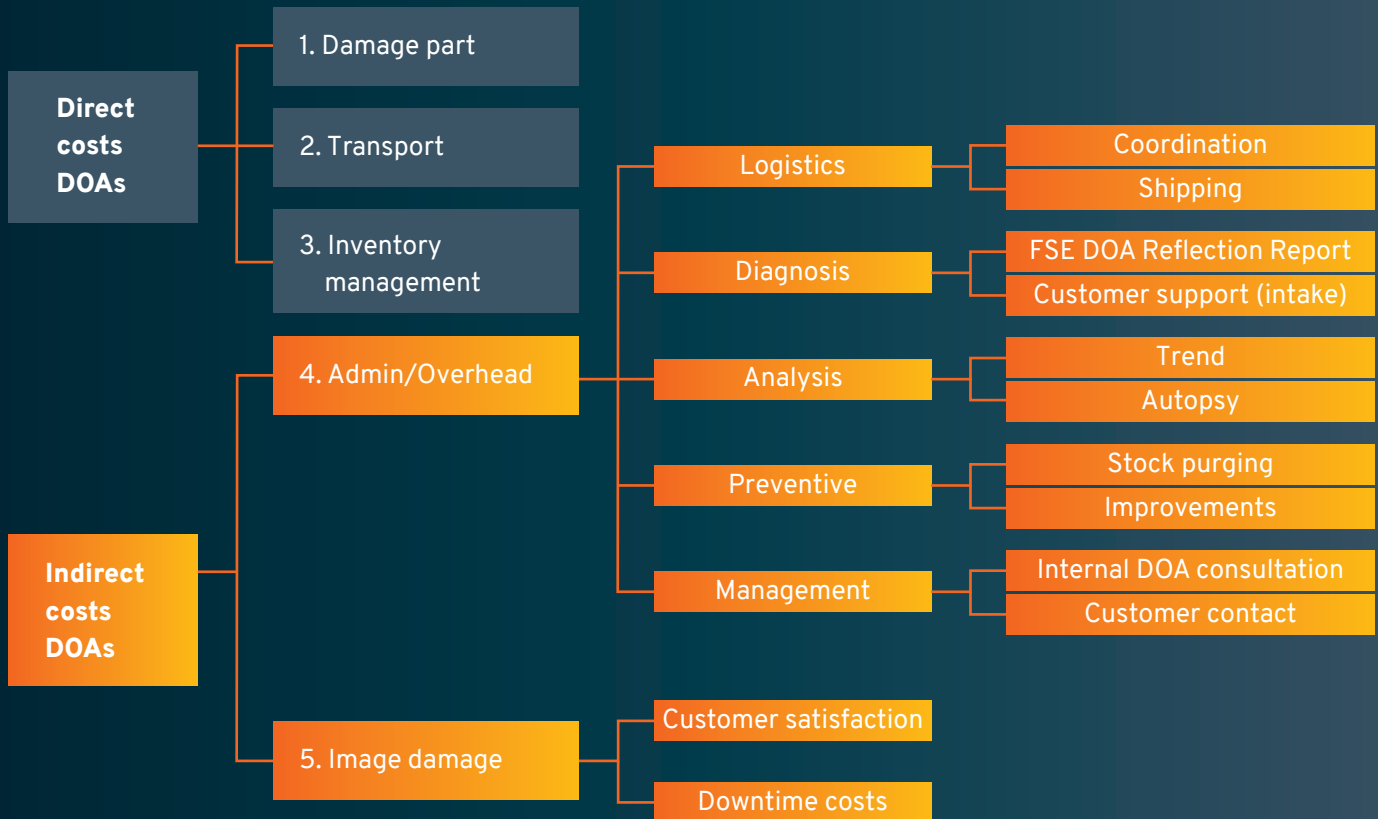


Addition of 'indirect costs'

Van Swieten (2013) mentions that indirect costs can have an even greater financial impact. Therefore, she suggested investigating these cost components: "The costs of overhead, such as managers and DOA analysis teams are high and can imply significant indirect costs for the company."

To identify indirect costs, the entire indirect process (all departments involved) was mapped at two hightech companies. A first draft was made based on theory, which was then improved by interviews with employees of the two companies. The aim was to get the best possible insight into who is involved in the process and how much time it takes these departments.

Model 2: DOA cost model of indirect costs



Research data

Logistics

Both companies always have spare parts in stock. A large amount of stock is kept worldwide so that a part can always be on site within 24 hours. Company 2 often sends several (different) parts to minimise the risk of a wrong diagnosis. Some parts are sent around the world up to 10 times a year. around the world.

Case	FTE/year	Shipping cost
Company 1	1,0 (min)	€ 1 million
Company 2	5,2	€ 2 million

Diagnosis

The costs for diagnosis consist of the costs for filling in a DOA report by the Field Service Engineer and the costs that a Customer Service department makes for the intake of a DOA.

Filling in a DOA report takes on average one hour, but can take up to 8 hours. The waiting and repair time are not mapped.

Case	Engineer FTE/year	Customer Service FTE
Company 1	2,0	7,2
Company 2	7,5	1,0

Analysis

Both companies carry out a trend analysis for the incoming DOAs in which they make an overview or a top 20 of the causes.

Case	FTE/year
Company 1	3,0
Company 2	3,0

An autopsy analysis is also carried out by both companies. The first company does all the root cause analyses itself, averaging 50 hours per DOA. The other departments analyse the part quality and logistical side of DOAs. The second company sends most of the parts for DOAs to external suppliers. Only a proportion of DOAs are investigated internally.

Case	FTE/year
Company 1	17,0
Company 2	14,0

Company profile

- OEM (Original Equipment Manufacturer)
- High service level - high customer demand
- Worldwide stock management of spare parts
- Complex supply chain
- Active worldwide

Preventive

As a result of a trend found or an improved product, the first company regularly carries out a stock purge. This involves recalling and adjusting a large number of parts, at a total cost of EUR 1.5 million. In addition, they even installed an extra test facility at one of their customers. Here, all components are tested for defects in a controlled environment before installation.

The second company carries out bin checks, but unfortunately the research data cannot be quantified. They also analyse the performance of external suppliers.

Case	FTE/year
Company 1	1,0
Company 2	3,0

The costs for Supply Chain Engineers are not included in this study. The above therefore represents the lower limit.

Management

The costs for management mainly include the internal DOA referral. These are DOA meetings that take place once a month / 6 weeks, from which corrective and preventive actions follow. In addition, extra costs may arise as a result of a serious DOA problem at the customer. Upper management will then be involved in the relationship with this customer. However, these costs have not been included.

Case	FTE/year
Company 1	3,0
Company 2	2,0

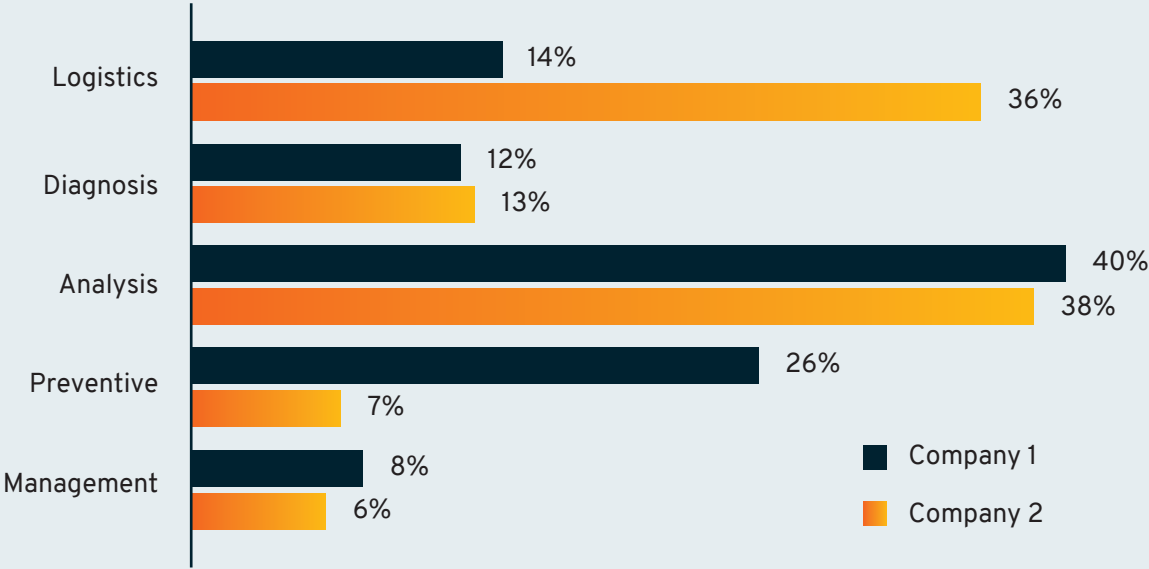
Research results

In order to quantify the data collected, hours for the various activities were collected and added to the FTE costs of the staff members.

Case	FTE/jaar	€/year
Company 1	34,2	7,5 million
Company 2	35,9	6,6 million

The graph below shows the relative distribution of total indirect costs. The high logistic costs for the second company and the high preventive costs for the first company are striking.

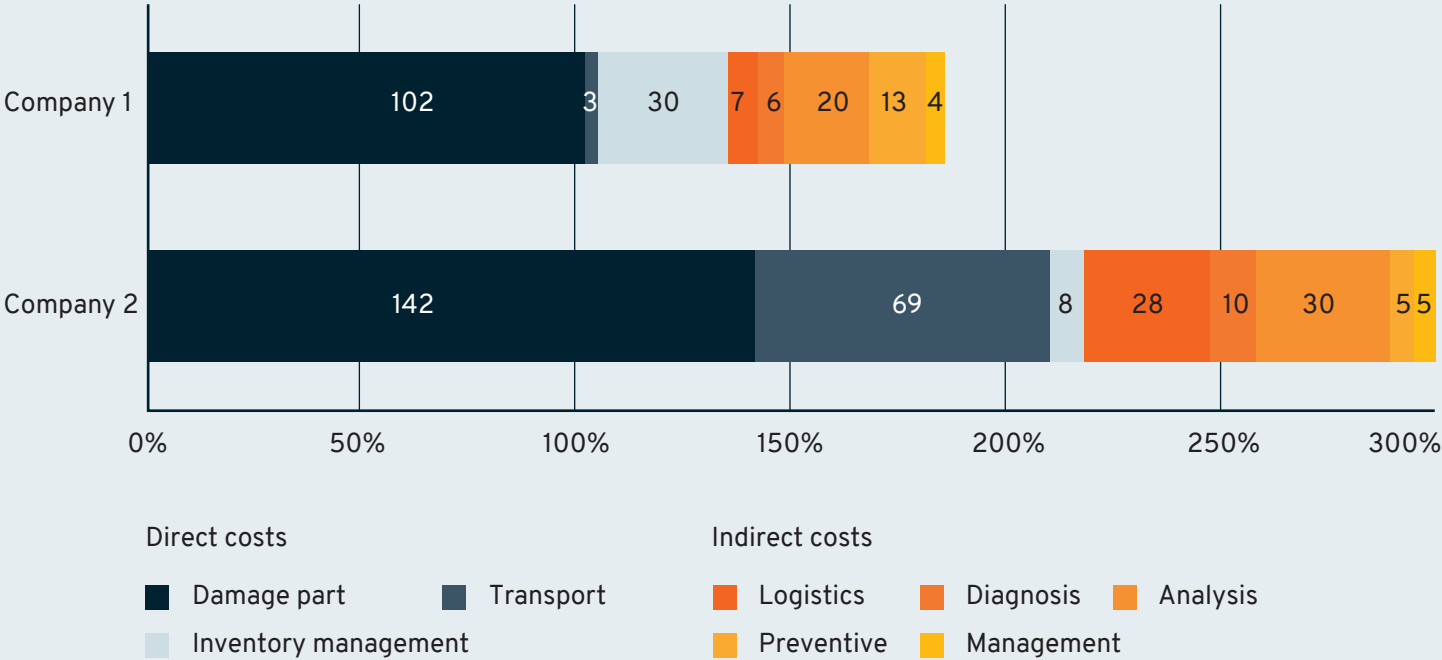
Graph 1: Indirect DOA costs per category



Total direct and indirect costs

The table below shows how the direct (Van Swieten, 2013) and indirect costs are structured. The total DOA costs for the first company are 185% of the initial price and for the second company even 297%.The ratio for the first company is 135% direct versus 50% indirect, while the ratio for the second company is 219% versus 78%. This This result can be generalised to a 1/3rd ratio.

Graph 2: Costs as % of DOA part



Indirect DOA costs as a percentage of parts turnover

The bottom table gives an overview of the impact of indirect DOA costs on the turnover of spare parts. It lies between 1.6% and 2.1%.

Table 1: DOA as a percentage of turnover

Case	ACP _{DOA} (€)	CP _{tot} (%)	N _{DOA}	C _{tot} (mln)	Revenue (mln)	% of revenue
Company 1	15.164,00	50	1.000	7,58	354	2,1
Company 2	710,00	80	12.000	6,82	439	1,6

Most spare parts divisions have a profit target of 20%.
When DOAs are tackled and eliminated, there is 2% less indirect cost and the profit (20% of turnover) can therefore grow by 10%.

- ACP DOA:** The average cost per DOA spare part
- CP tot:** Average percentage of indirect costs DOAs
- N DOA:** Number of DOAs per year
- C tot:** Total indirect costs due to DOAs per year (ACP * CP * Ndoa)
- Omzet:** Extracted from the research of Van Swieten (2013)

Conclusion: 30% more profit by tackling DOAs

- The indirect costs of DOAs reduce the profit by 10%, the direct costs by 20%
- This is only a lower limit, because not everything can be quantified. The actual costs will weigh 30-50% of the profit.
- Customer satisfaction is the most important thing. The cost of losing a customer is customer are higher than the indirect DOA costs.

Additional conclusions

- 60% of DOAs are caused by human error.
- Indirect DOA analysis costs amount to between 1.6% and 2.1% of sales in spare parts.
- The total cost per DOA is respectively 185% and 297% of the original product value.

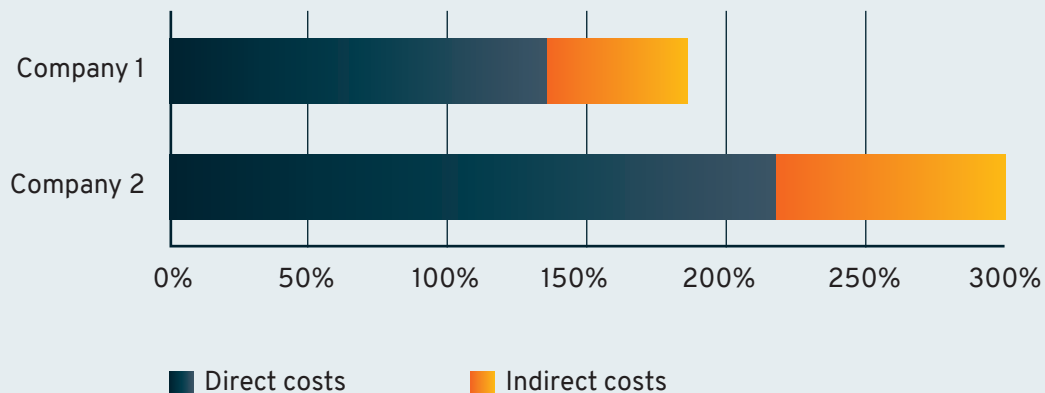


Image costs are most important

In most interviews, both companies mentioned the absolute importance of customer satisfaction. This was much more important than the total cost of DOA research. The cost of losing a customer is higher than the indirect DOA costs.

Example

A machine is down for an average of 4 hours (based on research by Van Swieten, 2013) due to a DOA. The costs amount to 50,000 euros per hour, as indicated by company 1. However, this company has also indicated that only half of DOAs have an impact on the customer. So for every hour that the machine is down, it costs the customer 25,000 euro.

All this adds up to 100,000 euro per DOA. When we look at the total picture, it appears that the costs of downtime for the customer can add up to 100 million euro annually.

Advice on tackling DOA

Based on both studies, it is appropriate for both companies to investigate the causes of DOAs. What are the major costs, where are they located and where can profits be made? Research shows that more than half of DOAs are caused by human error. Lack of craftsmanship, incorrect packaging or bad repairs by Field Service Engineers can be at the basis of this. Training and good instructions are necessary.

In addition, it is advisable to focus more on the costs of downtime and the possible image costs associated with this. Since the costs of downtime are higher than the costs of research into prevention, it is also advisable to focus on this. Investing in prevention makes you stand out in the market.

Suggestions for (follow-up) research

Even more important for companies are the 'follow-up sales'. A poor performance in the DOA area irrevocably leads to the loss or long postponement of a follow-up order. This may well have a higher impact than the costs of DOAs already investigated. This aspect, as well as downtime costs, we would like to address in the next study.

Faes - The Packaging People

We at Faes have known about this hidden cost for a long time and the first research at the time showed that 20-40% of the DOA's have their origin in logistics with the packaging inseparably linked to it.

From years of experience we have found that the biggest cause is often not in the packaging, but in the control of the packaging process. You can think out the best and most innovative packaging on a high technical level, but if you don't get the use of it communicated to the work floor you will still fail.

Therefore Faes has developed a control tool for packaging called PackAssist. This software communicates in a very accessible way throughout your supply chain how you should act with packaging.

This approach, in which you stop the proliferation of packaging and go back to a harmonised set of packaging and in which you systematically guide and instruct the choices for how you package the product, demonstrably leads to a (logistical) DOA reduction of 50-90%.

**Would you like to know more about DOAs and PackAssist?
Please feel free to contact us.**



Epilogue

Dear readers,

Our first study on DOA costs showed that there are significant savings to be made in the area of direct DOA costs. We looked at the costs of the part itself, the extra transport costs and the influences on worldwide stocks.

It will be clear that a DOA also requires a lot of extra effort from an organisation. You do not immediately see these costs, but they are there, and we call this Activity Based Costing. In such a case, a DOA is a cost driver or the cause of all those costs. The present study has shown that these indirect costs amount to another 1/3 of the direct costs we quantified earlier.

In the first study, we showed that the profit on a spare part turnover could be 20% higher if DOAs were prevented. This study shows that this percentage can be as high as 30%.

We will continue to investigate this phenomenon. A third study will focus on image damage. A quick first intervention shows us that customers of OEMs suffer damages of up to € 100,000,000 per year as a result of unplanned downtime.

Kind regards,

Ing. Johan Faes
CEO Faes



Faes
The Packaging People



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