Data analysis within the Transport & logistics industry: significant unexploited potential

Study into the maturity of applying data analysis to support business operations

mazars

Table of contents

Management summary

Data analysis offers many concrete opportunities to improve business operations, but application is still in its infancy in many organisations.

With this study, Mazars examined the application of data analysis within the transport and logistics industry and the extent to which this contributes to improving business operations. For this study, we interviewed sixteen companies, discussing the origins and current use of data analysis, but also the ambitions and what is needed to translate these ambitions into reality. And also, what went well and what possibly could have gone better.

Based on the interviews, we see that many companies are taking (first) steps towards a more data-driven organisation. In order to clarify this, we have used the so-called Gartner Analytics model, which describes four maturity levels that indicate the current maturity level of data analysis. The majority of T&L companies are currently on level 1 ('what happened') or level 2 ('why did it happen'). However, we do see a clear ambition in the industry to grow to the next levels. Based on these interviews and an analysis of the data that came to the fore in the interviews, we conclude that, on average, the application of data analysis in this industry is still in its infancy and that the potential of opportunities is only being capitalised on on a small scale.

One of the key conclusions from our study is that vision and leadership from the management of the company are necessary in this industry to develop data analysis within the organisation. Bottom-up development alone will not be enough. The use of data analysis often starts with small projects and tools from the Planning and/or Finance departments. And we see that these projects often quickly lead to (financial) results. This is partly due to more and deeper insights into relevant KPIs, that are (very) up to date and reliable, enabling better and direct (management) control. A mix between experienced employees and HBO/MBO (university of applied

science level/secondary professional education level) graduates (in the field of Econometrics or Business Intelligence, for instance), contributes to the success factor. The side effect of these applications is that the organisation is seen as an attractive working environment for young talent.

We have distilled a number of best practices from the companies that are already further ahead in applying data analysis. We have combined these with our own knowledge and experience in this field, supplemented with insights from the interviews. The most important of these best practices is that the application of data analysis is taken up by the management, together with the employees. Data analysis is not simply about systems and IT, it often means a different way of working by relying (learning to rely) on data in combination with years of experience and insight.

The interviews took place in the period between December 2019 and February 2020 and, therefore, just prior to the period of the Covid-19 pandemic and its impact. As a result, we were unable to include any effects of this crisis in our study. Based on the feedback on the outcome of this study to the participating companies and our own insights into current affairs within the T&L industry, there will be an addendum to this report, which will highlight the effects of the crisis on the application and use of data analysis.
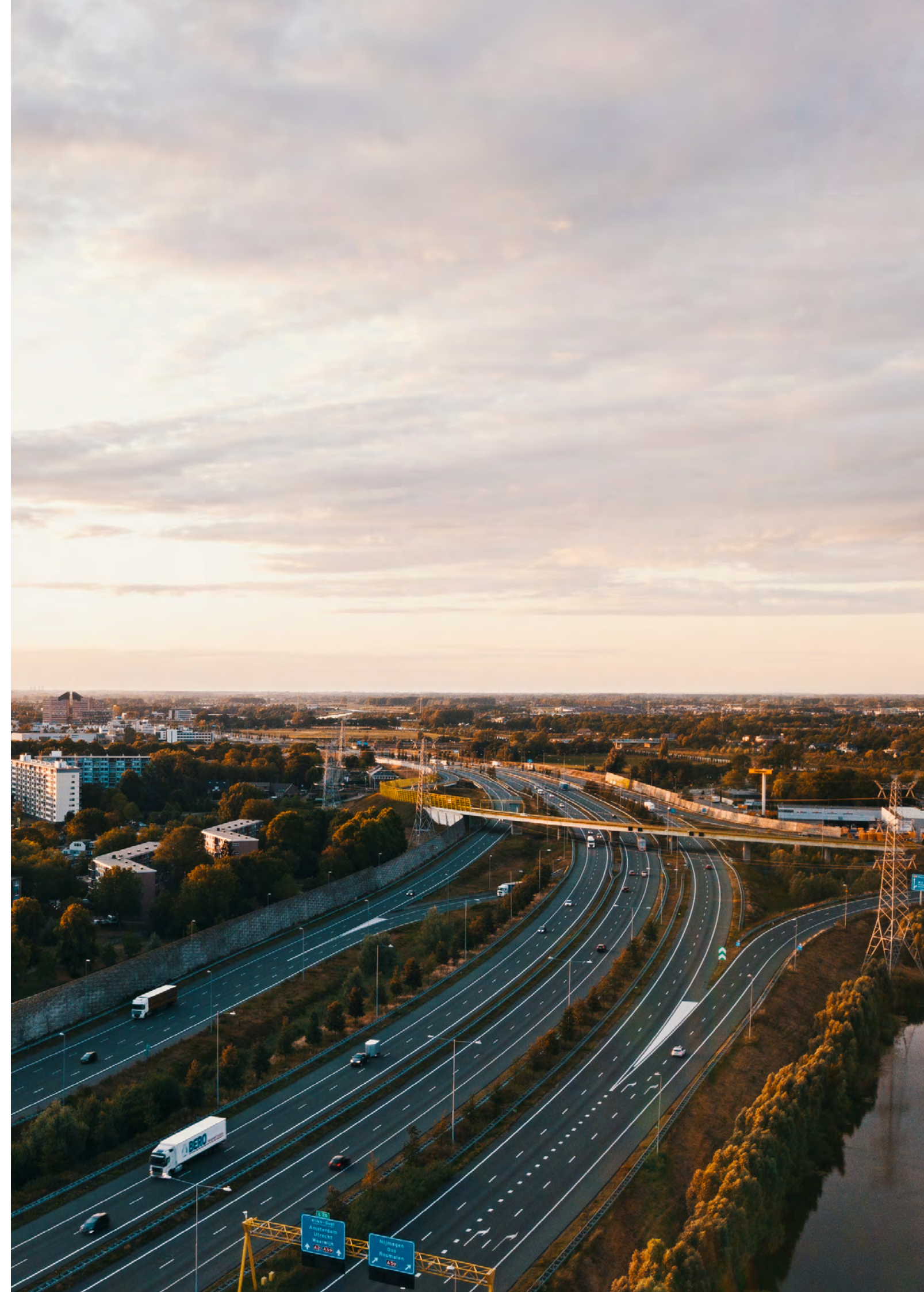
Preface

Developments in data and new technologies are going to change every company. That will not be any different for companies in the Transport & Logistics industry. Margins in this industry are often narrow and volatile, so the correct control information is crucial when taking risks for optimised business operations. The difference between the leaders and laggards in this industry lies in its ability to embrace new developments and applications. Knowing where the opportunities of data analysis are and how to use them is the starting point.

The interviews took place in the period prior to the corona crisis and its consequences. This period obviously has a major impact on the T&L companies and the way they are managed now. We have not yet been able to include any effects of this on the application of data analysis in this report. We intend to publish an addendum to this report after the summer to clarify the consequences for the application of data analysis in the T&L industry.

Currently, the focus is often on sharing operational data within the logistics chain and between the chain partners in order to further optimise the chain (consider for instance data sharing platforms, blockchain applications and cross-chain planning tools). The use of (management) data is given less attention in order to further optimise internal business operations. This involves data for more insight and better decision-making in the own company, for instance real-time and online financial and performance dashboards, insight into hiring / purchasing, trip and cost analyses, client behaviour and orders, analyses of contracts and returns (per client / product / trip).

How does the T&L industry view these possibilities? What is its state of play of their development? Are there any opportunities here and are they capitalised on? Which bottlenecks do they encounter? And of course, how much does it yield?

We have noticed that an increasing number of T&L companies have the need to gain insight into these questions. For this reason, Mazars has launched a sector inquiry into the application of data analysis for the internal operations of T&L companies.

You can find its results in this publication. The report provides a proper insight into what T&L companies deem important when applying data analysis in their company and their experiences with that. This creates a good starting point for the direction and content of data analysis within your company, or its further development.

Marc Engel
Partner Digital Transformation & IT
Consulting en Transport & Logistics

Remco Schoonderwoerd
Partner Family Businesses and Sector
Leader Transport & Logistics

1. The study

Target group and study approach

For the T&L study, we spoke to a total of 16 companies, all active in the Dutch T&L industry. For instance, we spoke to the CFO, director/major shareholder (DGA) or CEO of the T&L company. At the end of the interview, the person who conducted the interview completed an extensive questionnaire. On the basis of this questionnaire, which consisted of qualitative and quantitative questions, the various companies were compared. From this collected data, we have been able to draw various examples, trends and conclusions.

In the study, we made a distinction between large(r) and small companies. This approach was chosen to see whether the size of the company would affect the use of data analysis. In addition, we also looked at whether the size of the company would lead to other challenges or priorities with regard to data analysis. The classification between large(r) and small companies has been made on the basis of (net) turnover (€100 million). The companies interviewed were, on the one hand, companies that focus mainly on transport and, on the other hand, companies that focus mainly on warehousing or a combination of both.

Levels of data analysis (Gartner Analytics model)

In order to be able to test the maturity of applying data analysis, we used a model developed by research company Gartner. The 'Gartner Analytic Ascendancy Model', displayed in Figure 1, shows the relationship between the various types of analysis. The model identifies four different types of analysis and ranks them according to value and difficulty. Below, each individual 'step' of analysis is further explained and some matching examples are given.
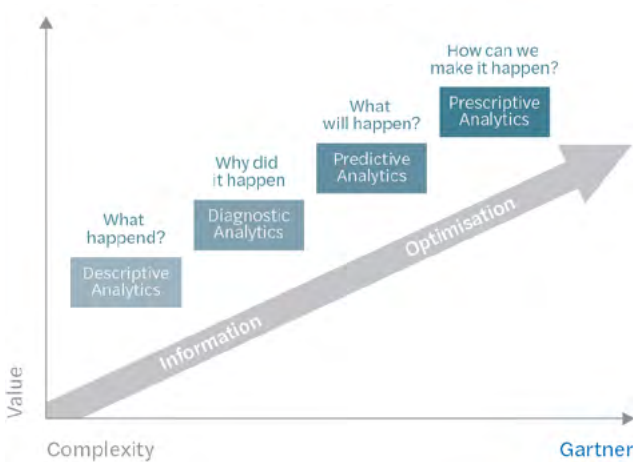
Figuur 1: Gartner Analytics Model (bron: Gartner)

Descriptive analysis

A descriptive analysis is the simplest form of analysis discussed in this model. However, its importance should not be underestimated. Since a descriptive analysis is the first step in a complex process, it provides a solid basis for further analysis. The purpose of a descriptive analysis is to answer the question of what happened. What descriptive analyses cannot do is explain why it happened, only what happened. The interesting thing about descriptive analysis is the fact that powerful insights can be obtained with a few simple mathematical operations such as mean, median, mode or minimum and maximum values. Some useful tools for descriptive analysis are Microsoft Excel and SPSS.

Diagnostic analysis

A diagnostic analysis answers the question as to why something happened and takes a closer look at the data by comparing historical data with other data. Some commonly used techniques in diagnostic analyses are details, correlations, probabilities and identification patterns. With the availability of context, answers can be found to questions such as 'why is our transport margin developing better / worse for retail clients than for manufacturing companies?' or 'why is the number of kilometres driven in Germany higher / lower than last year'. Diagnostic analyses provide insight into causal relationships by looking back in time. Tools such as Microsoft Excel and SPSS can be used for this form of analysis, but you will soon be faced with their limitations. For this reason, you might want to switch to more advanced tools such as QlikView and Power BI.

Predictive analysis

By looking back in time, predictive analyses can look ahead to the future. As mentioned earlier, a descriptive analysis forms the basis for a more advanced analysis. In this stage of predictive analysis, the quality of the previous two types of analysis demonstrate their significance. Without a reasonable amount of high quality data, estimations of the step prior to the predictive analysis are useless. Moreover, the predictions provided are the probabilities of the occurrence of a specific event, therefore, it is not guaranteed that an event will actually occur. One of the best known examples of predictive analysis is demand forecasting, in which companies use historical data to predict next month's demand. When

such a model is accurate enough, further decisions can be based on it, such as, for instance, maintaining lower stock levels. Some useful tools for predictive analysis are Tableau and Power BI, which use programming languages such as Python en R.

Prescriptive analysis

The final step of the model is a prescriptive analysis, which answers the question as to which action should be taken to obtain a future benefit or reduce a threat. The prescriptive analysis builds on the outcome of the diagnostic analysis, but does not just predict what is likely to happen. With a prescriptive analysis, all the favourable results come to the fore and it indicates which actions need to be taken to achieve a certain result. Unlike the previous three types of analyses, prescriptive analysis uses a feedback system to learn from and improve the relationship between prescribed actions and their results. A well-known example of a prescriptive analysis are the recommendation systems used by Netflix or Spotify. A user will submit data or give a rating to recommend an item to another user who has a similar taste but does not have the item in their current list. It is also possible to use individual characteristics of an item to recommend additional items with similar characteristics.

Now that we have explained these four types of analyses, we are able to better understand the adjacent Gartner Analytics Ascendancy Model. The model presents these types of analyses as a kind of linear growth from one 'step' to the next. Although this is a simplification of reality, the reasoning behind it is sound. If you want to apply a predictive or even prescriptive analysis, you should start at the level of a descriptive analysis and continue from there.

1. The study
Continued

Analysis based on the Gartner Analytics Model

The Gartner Analytics Model is a suitable way to show which forms of data analysis are currently being used and where ambitions lie.
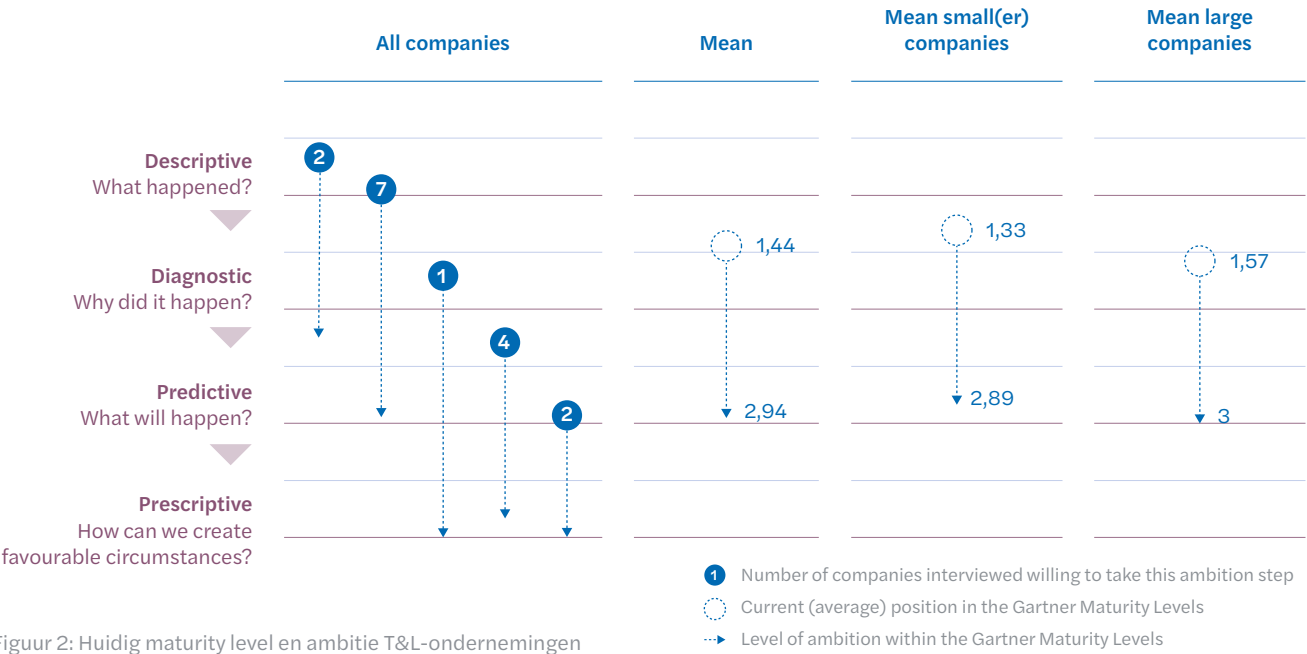
Figure 2 displays the various parts of the model on the right. In addition, it shows where the interviewed companies are now and where they want to go. You can see that the majority of the companies interviewed are currently on the first level (descriptive), some are already on the second level (diagnostic) and one is already predicting on the basis of data (predictive).

Most companies in this industry are ambitious and would like to move to the third and fourth levels in due course. You can see that, on average, companies between levels 1 and 2 also have the ambition to increase their maturity levels by an average of one and a half levels (second column in Figure 2). If we break this down for the small(er) companies, we see that, on average, they have a slightly lower maturity level, but do have the same ambition (third column in Figure 2). The large companies are on average slightly higher in the maturity levels and the ambition step is on average slightly smaller.

### Ability to exploit the potential of data analysis

In order to be able to realise the ambitions in the coming years, we looked into the current situation within the company, for instance the employees, IT capacity and culture. This way, it is possible to assess the extent to which the company is actually capable of achieving these ambitions. It appears that many companies (over 50%) are only partly able to cope with this transition (under development). We also see a large number (more than 35%) of companies still in the start-up phase (start) of this transition. Two companies have already 'implemented' or fully integrated the phase.

Gartner Maturity Levels

Figuur 2: Huidig maturity level en ambitie T&L-ondernemingen

- 1 — Number of companies interviewed willing to take this ambition step
- ○ — Current (average) position in the Gartner Maturity Levels
- ⇢ — Level of ambition within the Gartner Maturity Levels

Capitalise on the potential of data analysis

■ Start-up ■ Under development ■ Implemented ■ Fully integrated
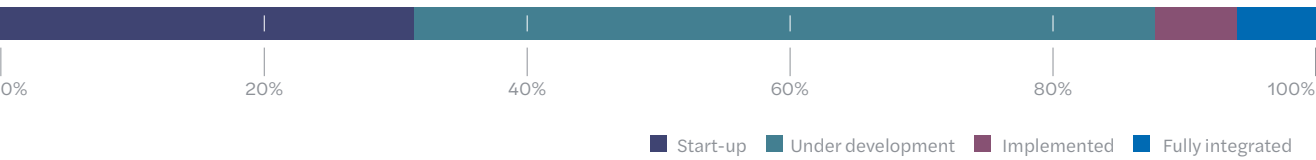
2. Findings

In the sections below, we elaborate on the outcome of the study on the basis of a number of themes and topics. Where possible, we have also included a number of characteristic statements that were made during the interviews.

Effectivity of data analysis

0% 20% 40% 60% 80% 100%

■ Low ■ Average ■ High ■ Very high

Vision and roadmap for transition

The management's view is a prerequisite for a successful transition - and its speed - to the application of data analysis within the company. This vision is often fuelled by the necessity to quickly and alertly control an environment that rests on change and relatively narrow margins. This imposes requirements on insight into the performance and impact of decision-making. However, having a vision is not enough; that vision must also be operationalised. We see that the majority (80%) of those surveyed do not yet have a clear roadmap or anything similar, which gives the growth of data analysis within the company direction and a dot on the horizon. However, we do see that there are vision elements from the board on the use of data analysis. And we also observe that the companies that do have a vision on the transition towards a data-driven company are among the somewhat larger companies (although there are just as many larger companies that have not yet started working on a roadmap). The need for data analysis in the workplace is evident in some cases, which contributes significantly to the acceleration of application and development in the company.

The study also shows that 11 interviews revealed that having a vision is an essential prerequisite for the transition.

"You have to keep investing to stay in business. Just like investing in equipment, continued investments in IT is a no-brainer. Every company must become a 2.0"

CFO on investing in new technological applications.

Investments

The persons interviewed were also asked specifically about the (intended) effects of data analysis within the companies. For instance, over 60% experience the level of effectiveness of data analyses within the company as high or very high. An example of this effectiveness is to have automated management information available in a dashboard, so that a DGA or CFO can immediately gain insight and make adjustments based on this information. Other effects are viewed in client satisfaction, control and better insights into, for instance, returns.

It is also striking that in just a few interviews the budget is mentioned as a crucial prerequisite.

The vision on the possibilities of data analysis (from a management and workplace point of view), as well as the willingness of the company to change, are deemed more important factors.

"We want to become the Uber of transport in our industry"

CEO on the application of new technologies and the possibilities it offers to set up a different business model.

"More IT investments. Too few people to realise this ambition"

CFO on investments in the field of IT in order to continue to meet client expectations and achieve the ambitions.

Looking back, the persons interviewed state that investments in the application of data analysis are highly worthwhile and that these will be continued. It does not always involve large sums of money. In most cases, no concrete business case has been drawn up either; the investment is made on the basis of the vision and need to develop data analysis. Investments usually take place in new data analysis / BI tools, pilots, and education and training of employees. The leading companies indicate that the company should have invested in this much earlier.

Roadmap for data analysis

0% 20% 40% 60% 80% 100%

■ No ■ Yes

2. Findings
Continued

As T&L is a competitive industry with increasingly demanding clients regarding information and data, it is important to know where the competition stands in terms of the use of data analysis in order to take a clear position towards the competition.

More than half of the companies interviewed want to be ahead of the competition. We see that on average the larger companies want to be ahead of the competition slightly more often than the smaller companies.

Gewenste positie ten opzichte van de concurrentie

| 0% | 20% | 40% | 60% | 80% | 100% |

■ Afwachtend ■ Gemiddeld ■ Voor ■ Ver vooruit

Employees

As the interviews also show, culture and the talent of employees are seen as key prerequisites. When we look at the role of these employees, we see that the majority of them are neutral towards a transition towards a more data-driven approach in the company. About a quarter is a driving force. In one or two companies, there is less understanding among employees. We do see an interesting difference between the somewhat younger employees, who have recently completed an HBO/MBO programme (and often have already come into contact with data applications and analysis tools) and the somewhat older employees who have been used to relying on

their own insight and experience in decision-making for many years.

We see that companies where employees are a driving force in the use of data analysis are often somewhat smaller. The reason for this could be that employees feel more responsible or are given more room to work on new developments.

These aspects also support the idea that talent and culture within companies are important prerequisites for a transition.

De rol van medewerkers

| 0% | 20% | 40% | 60% | 80% | 100% |

■ Geen begrip ■ Neutraal ■ Trekkende rol

Talent and culture are most often cited as key prerequisites for continuing the transition. Next, of course strategy and leadership, after setting this in motion, remain indispensable and remarkably enough, financial / budget is mentioned the least. When something is strategically relevant, a budget is earmarked. What we also see is that the benefits it brings are not a discussion for additional investments. We see that average companies have used 1 - 2% of their turnover for this purpose throughout the years.

Departments	Prerequisites ; number of times mentioned
Talent / Culture (HR)	14
Strategy / Leadership	11
IT / Technology	10
Financial / Budget	3

"Absolutely getting IT in order, automating processes as much as possible and dare investing in them. Most important is the commitment of the employees. Involving young employees"

CFO on creating commitment among employees in the event of IT changes

Conclusions

Based on the interviews and our findings, we have reached a number of conclusions. Here, we have clustered the most common findings into six (main) conclusions. These are further described below and can be traced back to the outcome of the study as described above in the report. Overall, we see that the application of data analysis is only in its infancy and that small but proper steps have been taken within many companies.

A positive step, for instance, can be deduced from the fact that some companies have recently purchased a BI solution and are still experimenting with it. Or the fact that some companies have already formulated a vision, but do not have a clear plan on which subsequent steps to take. There is still a lot to be gained so that data analysis can make a significant contribution to the further optimisation and professionalising of business operations.

1. The board's vision and leadership are the most important success factors in becoming a data-driven company

In order to be successful in applying data analysis, both in the short and in the long term, it is important to have a clear vision and to actively disseminate this vision by the management (executive sponsorship). The companies that scored better in our study based on the Gartner Analytics Model all had a clear vision and strategy about using data analysis to support internal business operations. In addition, there was also a clear motivation towards employees to be active in this area. This involvement from the management creates the right culture to apply data analysis widely throughout the company.

2. Data analysis starts and grows from the Finance and/or Planning departments

During the study, we noticed that much of the need for data analysis comes from the Finance and/or Planning departments. This stems from the fact that fast and correct decision-making is crucial for the performance and profitability of T&L companies. The Finance department is already more accustomed to analysing data and making reports, which makes it logical that new initiatives in the field of data analysis

are started from this department. In addition, we see that initiatives in the area of data analysis are also being started within the planning departments. Due to increasing complexity in the planning process, as a result of which it is simply no longer possible to work with a physical planning board, the possibilities of data analysis and data reporting are being examined in order to deal with this complexity properly.

3. Investments in the field of data analysis contribute to concrete (financial) results, for instance return improvements

Investments made in the field of data analysis are mainly about purchasing new tools to enable data analysis. In addition, there are investments in hiring new employees with a background in econometrics or data science, in order to maximise the value from the available data and the use of new tools for data analysis. Many of the interviews demonstrate that the investments in the field of data analysis seem to be recovered without this always being immediately apparent. This is deemed crucial. We noticed that IT investments are still sometimes seen as investments that will only be recovered in the long run. For instance in comparison with the purchase of new equipment or spaces. This provides a direct return on investment because they can be put into immediate operational use. Nevertheless, a number of entrepreneurs think that investing in this alone will not lead to a sustainable situation in the longer term. Precisely because margins are narrow, overheads need to be minimised, clients have become or are becoming more demanding and the competition is increasing, investing in data analysis (and IT in general) is inevitable.

4. Investments often start with BI tooling and small (pilot) projects

When we look at what investments are being made and what is being invested in, we observe that many companies start with purchasing a Business Intelligence solution. In some cases born out of necessity because, for instance, working in Excel spreadsheets no longer meets the expectations. We also see that the deployment of this BI solution often starts with a small-scale initiative, for instance in the form of a pilot. Strikingly, a (new) BI solution is not selected with due care. In some cases, a simple comparison is made between a number of different BI solutions, but a final choice is not always based on an analysis on the basis of predefined requirements.

5. A proper mix between enthusiastic, experienced employees and young talents increases the chance of support and commitment considerably

Due to the increasing complexity in a planning department, we see that all kinds of IT solutions are being used to deal with this. However, this also requires an adjustment in the way of working, which not every employee in the department can handle equally well. Especially the somewhat older employee indicates that they have difficulty adopting these (new) technologies. On the other hand, young, recently graduated employees are well able to master new technologies in a relatively short period of time. They often have good analytical skills and a much more affinity with IT. However, in most cases these young employees lack practical experience. Something quite essential for proper planning. Therefore, we notice that many companies are looking for a proper mix between enthusiastic, experienced employees who want to master new technologies and young talents who want to immerse themselves in the subject of planning.

6. Applying data analysis is a means to remain / become attractive to young talent

During a number of interviews it became clear that the application of new technologies, in this specific case data analysis, is seen as a means to attract young and talented employees.

For recent HBO graduates, the T&L industry is not always the most obvious choice to look for a job. The offer to work with new technologies is seen as one of the means to become or remain an attractive

Best practices
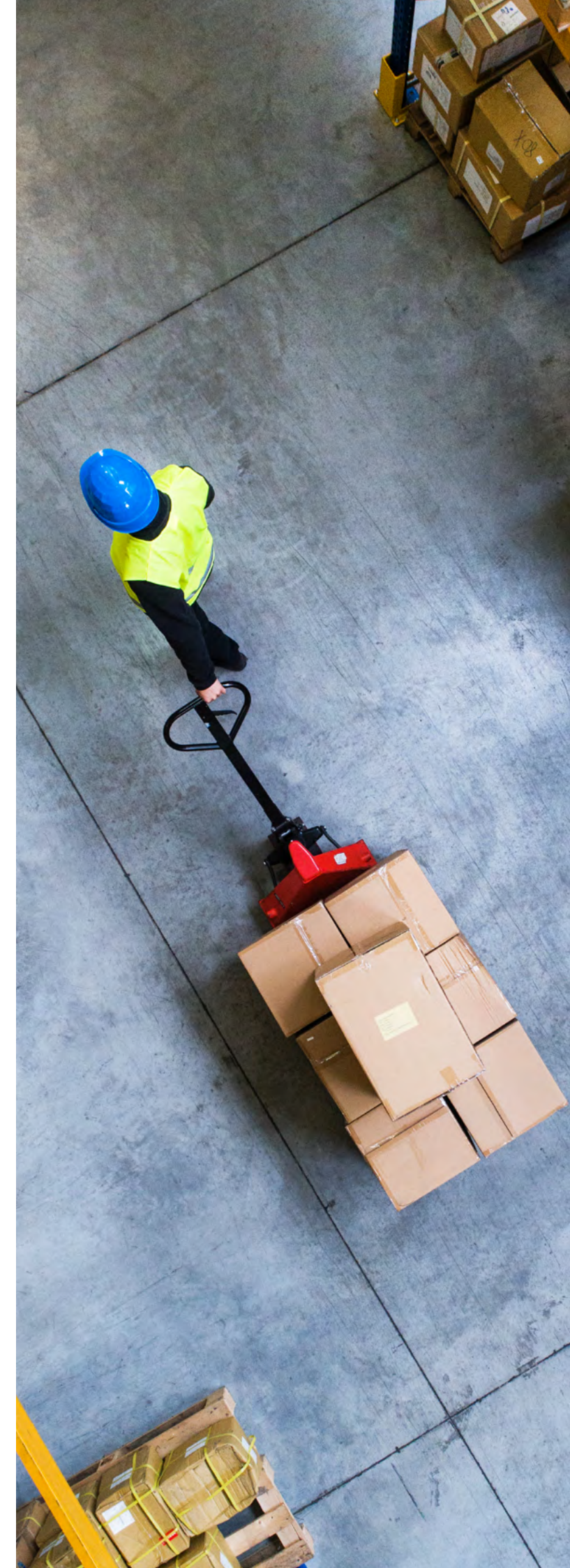
During the interviews, various experiences came to the fore that can be seen as a good approach for setting up and working with data analysis within a company. Based on this, combined with our own knowledge of and experience with the T&L industry on the one hand and the field of data analytics on the other hand, we present a number of best practices below.

Develop a vision on the possibilities of data analysis and get started

There is a clear responsibility for management here. Within the T&L industry, the importance of data analysis will only increase further. Insight into performance, clients, competitors and (new) employees will enforce this. It is important to have a vision on the application of data analysis in one's own company. The knowledge needed can be contributed in different ways. Internal expertise within the company itself may contribute to this and sometimes external expertise may be a good start. Observing (IT) suppliers, clients and colleagues may also help. However, there is no need to become a specialist in this field - it is important to understand the reason for doing something and which content and direction you want to move in: 'Think big - start small'. The sequel is 'learning by doing' which we have seen many successful T&L entrepreneurs do in this field. Don't make the start too big either, but start with pilots to learn and build on that. Don't be afraid to invest.

Formulate KPIs based on the business vision & strategy: what do you want or need to know?

In some cases, we see that when formulating and elaborating KPIs the 'buttons that can be turned' are looked at from the perspective of a certain department or business unit. The result is often an extensive list of KPIs that might say something about the performance of an individual department or business unit, but that say too little about performance as a whole. This will bring about the risk that everyone controls and monitors their own KPIs, without having a clear idea of the extent to which this contributes to the realisation of the business vision and strategy. That is why it is important to determine together which KPIs may actually mean something in achieving the vision and strategy and to monitor and control them integrally. For instance, by providing

immediate insight into the financial consequences (profitability) of a particular trip or planning. In many cases, this results in a considerably smaller number of KPIs, making it easier to oversee the overall picture.

Provide insight into important elements of data analysis (for instance common analytics tools, selection criteria and a data model)

Based on our conclusion that in many cases no thorough selection is made when purchasing a BI solution, it is advisable to pay more attention to this. There are enough providers of BI solutions on the market, some of which are clearly distinguishing themselves from the others. It is advisable to take note of the differences between these providers and of the distinguishing characteristics of a particular provider.

Prior to selecting, it is also important to carefully consider the criteria that the new solution should meet (for instance functional requirements, maturity, user interface, the possibility of making adjustments and/or expansions yourself, integration into the IT landscape, cost structure). The clearer these selection criteria are, the easier it becomes to select a suitable solution. If there is no knowledge and experience in this area within the company, it is wise to seek support from an external and independent IT consultant.

One way of gaining insight into the differences in common BI solutions is to look at the so-called 'Gartner Magic Quadrant for Analytics and Business Intelligence Platforms'. Each year, research company Gartner publishes this comparison, in which the strengths and weaknesses are highlighted for each platform. This makes it fairly easy to see who is market leader in this field and who are followers.

In order to grow in the application of data analysis and to gain more advanced insights, the ability to

analyse data from different sources is an important aspect. In case data from multiple systems need to be combined, for instance in a data warehouse, it is important to think about having a proper data model. In a data model, definitions are translated, standardised and recorded from various source systems to ensure that unambiguous reports and analyses can be made.

Create a flexible and scalable IT landscape (now and towards the future)

In line with having a clear vision on reporting and analytics, it is important to create an IT landscape in which it is possible, for instance, to easily implement a new application. If, for instance, you want to switch to another BI solution, this should be relatively easy to implement without major modifications in one or more applications. In these kinds of situations, having a system that can integrate applications with each other helps to make an IT landscape flexible and scalable.

In addition, it is also good to consider how a particular BI solution fits into the already existing IT landscape. In particular for the longer term, it is key that a BI solution integrates well with other systems. This is a significant aspect in formulating the selection criteria when a new BI solution needs to be selected.

Many application providers are increasingly offering default analysis options in the relevant application. This makes it relatively easy, for instance, to present a dashboard based on the data from that specific application in order to be able to carry out analyses. In a new ERP system, for instance, various default reports are often already offered and implemented.

Involve employees in the application of data analysis

Introducing data analysis within a company is often accompanied by the introduction of new technology. In many cases, these new technologies also require a different way of working, for instance by working more 'fact-based'.

This may give rise to protests from employees, because they often rely more on years of experience and insights. For this reason, it is important to involve employees in this change as early as possible, for instance, during the development of a vision on the application of data analysis and the possible implementation and evaluation of a pilot. It is important that management actively propagates the vision on the application of data analysis throughout the company. Within a company, there are always a so-called 'early adopter' and 'followers'. Forming a 'coalition of the willing' may help enormously in creating a broad support base within the company. In all cases, good communication is essential.

Digital Transformation & IT Consulting

In conclusion

On average, data analysis is still in its infancy in the T&L industry. However, it offers quite a lot of potential to improve business operations now and in the future. Various companies have already made great strides and confirm the possibilities in the interviews we held.

Set a good example and other will follow suit, and we have noticed that ambition is present in the industry. Actually starting en following through are important to this end.

We therefore hope that the study and this report will contribute to the further realisation of this ambition. This report describes a number of best practices that we would like to discuss further with you. For now, we would like to thank everyone who contributed to the realisation of this report

Contact

Remco Schoonderwoerd,
Partner | Family Businesses | Transport & Logistics, Mazars
Tel.: +31 (0)88 277 16 45
remco.schoonderwoerd@mazars.nl

Marc Engel, Partner | Digital Transformation & IT Consulting
and Transport & Logistics, Mazars
Tel.: +31 (0)88 277 18 43
marc.engel@mazars.nl

Christel Monrooij, Junior Data Analyst, Mazars
Tel.: +31 (0)88 277 19 40
christel.monrooij@mazars.nl

Mazars is a leading international audit, tax and
advisory firm, aspiring to build the economic
foundations of a fair and prosperous world.
Operating as a united partnership, Mazars works
as one integrated team, leveraging expertise,
scale and cultural understanding to deliver
exceptional and tailored services in audit and
accounting, as well as tax and consultancy.

www.mazars.nl

mazars