LEADING THE CREATION OF A DATA-DRIVEN CULTURE
FOR EMPLOYEE THRIVING

by

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Abstract

Employee thriving and a data-driven culture are getting more attention from both academics and the practical field. Although both concepts are often studied individually, there is as of yet no framework with regard to the potential relationship of a data-driven culture in relation to employee thriving. In the current tight labor market, with trends like high employee turnover and burnouts, it is essential to have thriving employees. Next to that, a growing number of companies want to become data-driven although they are not aware of the effect on their employees. This study will attempt to develop a framework around the relationship of a data-driven culture on employee thriving and the role of leadership in relation to these concepts. In order to create a framework with regard to the relationship between these concepts, a total of 15 semi-structured interviews of approximately 45 minutes were held in four organizations that find themselves in the transition towards a data-driven culture. The sample of interviewees included both managers who are more at the forefront of the change toward a data-driven culture and employees who are more 'affected' by the change toward a data-driven culture. The existing literature about enablers of employee thriving, leadership styles that promote employee thriving and leadership styles that are helpful for the creation of a data-driven culture were studied. Existing literature was compared with insights that came forward throughout the interviews, in this way we were able to provide a clear picture on how abovementioned concepts are related and could harm and/or reinforce each other. The results showed that a data-driven culture can contribute to employee thriving. However, issues and opportunities that arise due to the creation of a data-driven culture should be taken into account. In this sample, a distinction was made between non-tech-based organizations and tech-based organizations. An instrumental leadership style and a transformational leadership style are leadership styles that are expected to have a positive effect on employee thriving in the context of the creation of a data-driven culture. More autonomy, a faster learning curve and recognition from supervisors are factors enabled by a data-driven culture that could enhance employee thriving. The emergence of a more professional environment due to a data-driven culture could be harmful for employee thriving, because it could harm the level of innovativeness, the freedom to try new ideas, and less interpersonal contact. The self-determination theory is used to explain why factors enabled by data-driven culture may influence employee thriving. This paper adds to the literature by making suggestions for future research on the aforementioned concepts.

Key-words

Data-driven culture (DDC), employee thriving, leadership, qualitative research, tech-based, non-tech-based.

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1. Introduction

Stress-related absenteeism, burnout and underperforming employees due to a high workload are big challenges for organizations these days. Research in the Netherlands showed that almost 37% of the working force provides work related stress as a reason for absenteeism, the cost of this absenteeism is almost 9.100,- Euro per employee (TNO, 2020). This is an increasing negative phenomenon, since the workforce is a valuable asset for organizations (Carmeli, 2004) and is vital for the development and success of organizations (Rodrigues da Costa & Maria Correia Loureiro, 2019). As economies become more knowledge-based it is increasingly important for organizations to have high-performing employees as a source for sustained competitive advantage (Moroko & Uncles, 2008; App, Merk, & Büttgen, 2012). In addition, in a growing unstable economic environment, sustaining high performance is important to gather competitive advantage (Prem, Ohly, Kubicek, & Korunka, 2017; Nawaz, Abid, Arya, Bhatti, & Farooqi, 2020). In order to create that competitive advantage and overcome the problem of burnout it is important for organizations to strive for employee thriving (Porath, Spreitzer, Gibson, & Garnett, 2012; Kleine, Rudolph, & Zacher, 2019). Another increasing phenomenon is that organizations aim for a more data-driven culture to achieve and maintain a competitive advantage (Mosig, Lehmann, & Neyer, 2021; De Medeiros & Maçada, 2021; Davenport & Harris, 2017). It is therefore relevant to look at the effect of developing a data-driven culture on employee thriving.

Thriving is defined as a positive psychological state characterized by a joint sense of vitality and learning. Employees who feel they thrive experience personal growth by feeling energized and alive and by having a sense of continuous learning by acquiring and applying knowledge (Spreitzer, Sutcliffe, Dutton, Sonenshein, & Grant, 2005; Kleine, Rudolph, & Zacher, 2019). Thriving has recently become more and more studied in the field of organizational behavior (Elahi, Abid, Arya, & Farooqi, 2020; Paterson, Luthans, & Jeung, 2014). An important enabler of job engagement and (therefore) employee thriving is decision-making authority (Roberts & Davenport, 2002; Kleine, Rudolph, & Zacher, 2019). It is potentially harmful to an employee's job engagement, motivation and thus on the person's well-being if the transition towards a data-driven culture is not well-managed. For example, in a case where a certain employee always had the authority to make decisions based on a combination of data, intuition, experience and consultation, now has to make the decisions solely relying on data. An employee could be affected by their authority. A leader can have a crucial role in influencing this transition and the thriving of the employee. So, it is in the interest for both the employer as well as the

employee to strive for thriving. However, employees' thriving together with engagement and motivation, can be harmed by an organization's transition towards data-driven culture since the data can harm the decision-making authority of an employee.

There is growing interest in how and why to create a data-driven culture in the practical field as well as in the academic literature (Dubey, Gunasekaran, Childe, Blome, & Papadopoulos, 2019; Yu, Wong, Chavez, & Jacobs, 2021; Olabode, Boso, Hultman, & Leonidou, 2022). Although a data-driven culture is getting more and more attention from both academics and practitioners, we know little about how to utilize this culture for better organizational performance (George, Haas, & Pentland, 2014). Whereas a culture of evidence-based decision-making is required to enhance the potential benefits of big data analytics (Dubey, Gunasekaran, Childe, Blome, & Papadopoulos, 2019). According to McAfee and Brynjolfsson (2012), the main management challenges that relate to the transition towards a data-driven organizational culture are: leadership, talent management, technology, decision making, and company culture. This study focuses on the cultural challenges of becoming a data-driven organization. Anderson (2015, p. 185) stated that culture is probably the most influential aspect of a data-driven organization. The hardest aspect of creating a data-driven organization is to align the culture. Culture is fundamental to favor the adoption of big data and to change the dominant mentality in favor of the business (Napier, Libert, & De Vries, 2020).

The two phenomena mentioned, data-driven culture and employee thriving, do not stand alone. There is a lot of potential tension between these concepts. For employees, interaction with people around them, like colleagues, superiors and managers, is essential for their health and well-being (Baumeister & Leary, 1995; Diener & Seligman, 2004; Kahn, 2007). Rath and Harter (2015, p. 8) emphasized the importance of social interaction on the work floor: "We are social beings, and our need to be connected to others does not disappear when we enter the office". On the other side, there is big data and companies that want to implement a data-driven culture and want to become more data-driven. There is a potential threat that the focus on data and data-driven decision-making detract from mutual contact. Carmeli and Gittell (2009) point out that high-quality connections are a source of job performance. Implementing a data-driven culture does not necessarily badly influence the above-stated factors, but it is important for organizations to take these kind of potential disadvantages from becoming (more) data-driven into account.

Only one-third of the organizations consider themselves successful in adopting a data-driven culture (Davenport & Bean, 2018). One of the key reasons for this is that creating a data-driven culture requires organizational change and what is particularly challenged in a data-driven context is the aspect of leadership (McAfee & Brynjolfsson, 2012). Furthermore, leadership is considered as one of the key determinants of the extent to which an organization becomes data-driven (Davenport & Harris, 2017). Research by Windt et al. (2019) emphasized the importance and difficulty of leadership in creating a data-driven culture, but does not come up with leadership styles that suit well for the transformation to a data-driven culture. The concepts employee motivation, employee well-being and (thus) employee thriving are closely intertwined. That is one of the reasons why the element of leadership is added in this paper. Another important reason is that it can be interesting to see if there are specific styles of leadership that both enhance employee thriving as well as help with the implementation of employee thriving.

This study is the first that combines the two upcoming phenomena: employee thriving and a data-driven culture. This paper gives an insight into how these factors could potentially influence each other along with the influence of leadership. Furthermore, this research gives insights into how a well-established data culture could enhance or harm employee thriving and what potential risks are, for managers, consultants and employees, when implementing a data-driven culture. When they are aware of these risks, they could also take action on them. This study also explores what happens during the process of becoming data-driven, looking at potential issues in creating a data-driven culture, how organizations can overcome those problems, which leadership style is helpful during this transition, how to maintain that a data-driven culture as looking at what this transition and this cultural change do with employees. These three phenomena (leadership, data-driven culture and employee thriving) are being studied in trying to answer the research question: **"How can the emergence of a data-driven organizational culture contribute, or oppose, employee thriving and what is the role of leadership style in this relationship?"**

This paper thereby gives insights into how creating a data-driven culture could affect employee thriving and should show the role of leadership style in this process. Ideally, we identify a certain leadership style distilled out of the interviews and observations that is beneficial for employee thriving and implementing a data-driven culture. Furthermore, this study should have the potential to give specific tips to managers and consultants to overcome certain problems in

implementing a data-driven culture that employees face during such a transition. Another important practical contribution of this research is to make companies aware of the fact that implementing a data-driven culture is not a piece of cake, but that next to the technical issues associated with becoming more data-driven also the cultural change during the implementation is, at least, equally important. Two leadership styles are identified as expected to be positively related to the transition towards a data-driven culture and employee thriving. Having a clear vision and giving individualized feedback are crucial for implementing a data-driven culture while also striving for thriving. Greater autonomy, an accelerating learning curve, a too professional environment and recognition from supervisors are factors that (may) result from a data-driven culture. It is important for managers to be aware of this so that a manager can optimally act on these factors. Next to that, it is important to always show that you can add the nuance to the data and that can it be helpful to bring in an external party so you show that creating a data-driven culture is really a priority.

In this study, semi-structured interviews are used in order to answer the research question and to develop a framework about leadership and employee thriving in the context of a transition towards a data-driven culture. The semi-structured interviews are held at organizations that are currently developing a data-driven culture. The interviewees are employees of different levels in these companies. The interview guides are based on knowledge derived from the literature and observations during meetings about the creation of a data-driven culture.

The remaining part of the thesis is structured as follows. The literature is discussed in section 2. The third section covers the research methods used and general information about the participating companies and employees. Furthermore, section 3 elaborates on how the interviews are analyzed. In section 4 are the results from the interviews presented. Following by section 5 in which the findings are discussed, limitations are summed up and suggestions for future research are made ending with a conclusion.

2. Theoretical Background

There is little known about the effect of creating a data-driven culture on the well-being of employees working in that data-driven culture and what kind of leadership could help to create this data-driven culture. This chapter discusses what is already known in the literature about a data-driven culture, what is known about employee thriving and what is already known about leadership style in relation to these concepts.

2.1 Big Data in Organizations

Research from Chen, Chiang and Storey (2012) based on a sample of 4,000 IT professionals from 93 countries and 25 industries shows that being data-driven has been a major technological trend for business decisions in organizations since 2010. Big data analytics help organizations with evidence-based decision-making and action-taking (Watson, 2014). Data-driven organizations exploit derived data in basing all business decisions on data rather than experience or intuitions from managers (Provost & Fawcett, 2013). According to a McKinsey survey (Bokman, Fiedler, Perrey, & Pickersgill, 2014), organizations that implement data-driven decision-making are 19 times more likely to achieve above-average profitability compared to laggards. Other studies show a direct positive and significant relationship between the capability of leveraging data-driven decision-making and, firm output and productivity (Brynjolfsson, Hitt, & Kim, 2011). Below we first describe the theoretical background of these different concepts and how they might link with a data-driven culture.

In the literature on big data and a data-driven culture several different concepts are being used. To give this paragraph a bit more structure, we first introduce several often-used concepts in the literature around a data-driven culture.

Big Data – Big data is the basis for the other concepts mentioned, De Mauro, Greco and Grimaldi (2016, p. 7) define big data as "the information asset characterized by such a high volume, velocity and variety to require specific technology and analytical methods for its transformation into value." Other researchers add to this definition that the data should be 'real time' (Khan & Vorley, 2017; Einav & Levin, 2014).

Big Data Analytics Capability (BDAC) – An important concept that is often associated with big data and a data-driven culture is big data analytics. BDAC refers to the ability to manage a huge volume of disparate data to allow users to implement data analysis and reaction (Wang, Kung,

& Byrd, 2018; Hurwitz, Nugent, Halper, & Kaufman, 2013). The definition used in the article of Wamba et al. (2017), which is adapted from Kiron, Ferguson and Prentice (2013), goes deeper into the definition of BDAC by dividing it into three dimensions; a technological part (infrastructure), a personnel (talent) capability part and a management capability part. This perspective has also been used in the research of Akter, Wamba, Gunasekaran, Dubey and Childe (2016) who found a positive association with all three dimensions. To make optimal use of an organization's BDAC it is very important to have an aligned organizational culture. According to Barton and Court (2012) and Behl (2022) a lot of companies have problems with exploiting their big data analytics capability because of the fact that their culture does not match with their BDAC.

Big Data Predictive Analytics (BDPA) – In addition to BDAC, BDPA has been seen as the organizational capability to process large volumes and varieties of data with the velocity to gain relevant insights, thereby enabling organizations to gain competitive advantage (Dubey, Gunasekaran, Childe, Blome, & Papadopoulos, 2019; Akter & Wamba, 2016). Based on the used references is the definition used in the article of Dubey et al. (2019) based on the following articles (Akter, Wamba, Gunasekaran, Dubey, & Childe, 2016; Wamba, Akter, Edwards, Chopin, & Gnanzou, 2015; Gupta & George, 2016; Pauleen & Wang, 2017; Srinivasan & Swink, 2018). It is remarkable that in none of these articles BDPA or Big Data Predictive Analytics are mentioned or discussed literally using 'BDPA' of 'Big Data Predictive Analytics'. In the article of Behl (2022) the concept BDPA is used, but it is seen as a part of the Big Data Analytics Capability. More recent articles also use BDPA as the concept for the ability of organizations to manage using huge volumes of data and make decisions based on that data (Ali, Yaacob, Parveen, & Zaini, 2021; Jeble, Kumari, Venkatesh, & Singh, 2020). They base this definition on the article of Gupta and George (2016) where little has been said about the predictive characteristics of big data and the concept BDPA has not been mentioned.

Above-mentioned are key concepts when studying data culture, data-driven culture, big data culture, data-driven decision making, etcetera. It is important to recognize the fact that lots of these concepts are used interchangeably. In this research we will focus on the concept of data-driven culture.

2.2 Data-Driven Culture

Another commonly used concept in the business and management literature of big data is the data-driven decision culture. Organizational culture is the set of values, beliefs and attitudes that members of an organization share in common (Sun, 2008). Culture consists of three levels according to Schein (1990) namely artefacts, values and underlying assumptions. Changing culture is a major challenge (Schein, 1991). This also applies to changing your organizational culture into a data-driven culture (DDC). DDC is seen as a collective pattern of shared behaviors and practices, which are based on the belief that having, understanding and using certain types of data and information plays a critical role in the success of organizations (Kiron, Ferguson, & Prentice, 2013). This definition captures the importance that companies exploit the data and attach it to the data rather than intuition (Mikalef, Krogstie, Pappas, & Pavlou, 2020; Provost & Fawcett, 2013). So it encourages evidence-based decision making (Duan, Cao, & Edwards, 2020; Vidgen, Shaw, & Grant, 2017). The presence of a data-driven culture would facilitate organizations to make data-driven decisions and rely on fact-based decisions to develop new products and services (Cao, Duan, & Li, 2015). Despite the challenges of technology and data quality for the adoption of a data-driven organization, the culture of an organization is considered as the significant barrier to the adoption of big data analytics (LaValle, Lesser, Shockley, Hopkins, & Kruschwitz, 2011). LaValle et al. (2011) showed that the reason why big data projects are often unproductive relate to the organizational culture, rather than the characteristics of the data and lack of technology. Organizations that possess advanced big data analytics capabilities, but are not capable of aligning this with a data-driven decision culture could not extract the full potential of this capability (Blackburn, Lurz, Priese, Göb, & Darkow, 2015). Hence, the success of predictive analytics depends on the degree of integration into the business process and the acceptance of managers and employees to use it as a decision-making tool (Arunachalam, Kumar, & Kawalek, 2018; Blackburn, Lurz, Priese, Göb, & Darkow, 2015). Creating a vision for utilizing big data analytics and the role of a manager is necessary to create a data-driven culture (Aho, 2015). Another commonly used definition comes from Gupta and George (2016). They define a data-driven culture, following Ross et al. (2013) and McAfee et al. (2012), as the extent to which organizational members (including top-level executives, middle managers, and lower-level employees) make decisions based on the insights extracted from data (McAfee & Brynjolfsson, 2012; Ross, Beath, & Goodhue, 1996; Gupta & George, 2016). The concept big data culture (BDC) has often been used instead of data-driven culture,

but they are used to illustrate the same concept (Dubey, Gunasekaran, Childe, Blome, & Papadopoulos, 2019; Yu, Wong, Chavez, & Jacobs, 2021).

To gain more insight into the concept of data-driven culture, we reviewed several definitions of a data-driven culture (see Table 1). The used articles are based on a systematic literature review on organizational cultural challenges of adopting big data studied by Lunde et al. (2019) and recent work about 'data-driven culture' found on Scopus. The literature on Scopus is firstly reviewed in March and April of 2022. In July was a secondary review done to look for potential newly published literature. There were no remarkable differences found in the new published articles. This overview shows that in the current literature there are three mature definitions used in articles that speak explicitly about a 'data-driven culture': The definitions of Gupta and George (2016), McAfee and Brynjolfsson (2012) and Kiron et al. (2013). What stands out is that when the definition of Gupta and George (2016) or Kiron et al. (2013) has been used, the article uses a citation of the definition mentioned in one of those articles. Whereas when a certain article refers to McAfee and Brynjolfsson (2012) these articles do not use a citation.

Table 1 Definitions used in the literature to describe a data culture

Definition Source	Concept(s)	Definition	Definition is being used in:
McAfee & Brynjolfsson (2012)	Data-driven culture	"To achieve this a data-driven culture is required, which will allow decision-makers to base their decisions more on insight rather than instinct." P. 483	Pappas et al. (2018)
	Data-driven culture	"Decision based on data rather than intuitions." P. 17	Jeble et al. (2018)
	Data-driven culture	"In fact, big data enables managers to make decisions based on evidence rather than intuition." P. 1923	Ferraris et al. (2019)
Popovič, Hackney, Coelho, & Jaklic (2012)	Analytical decision making culture and data-driven culture	"It refers to the way the decision-making process is established, based on information provided by BDA to support decisions." P. 162	Côrte-Real, Ruivo, Oliveira & Popovič (2019)
Kiron, Ferguson, & Prentice (2013)	Data-oriented culture	"a pattern of behaviors and practices by a group of people who share a belief that having, understanding and using certain kinds of data and information plays a critical role in the success of their organization." P. 18.	Duan, Cao & Edwards (2020, p. 675), Chatterjee, Chaudhuri & Vrontis (2021, p. 3), and Graen & Grace (2015, p. 401)
Gupta and George (2016)	Data-driven culture	"defines as the extent to which organizational members (including top-level executives, middle managers and, lower level employees) make decisions based on the insights extracted from data." P. 1053	Tabesh, Mousavidin & Hasani (2019, p. 352), Yu, Wong, Chavez & Jacobs (2021, p. 3), Persaud & Schillo (2017, p. 13), Auh, Menguc, Sainam & Jung (2022, p. 153), and Dubey et al.[1] (2019, p. Appendix A)

Note. Several other papers referred to Schein's general definition of organizational culture (Carillo, Galy, Guthrie, & Vanhems, 2019). Some other papers used no definition at all (Ylijoki & Porras, 2016; Frisk & Bannister, 2017) or referred to data-driven decision making (Provost & Fawcett, 2013).

[1]Dubey et al. (2019) refers in their own paper to McAfee & Brynjolfsson (2012) while using the definition of Gupta & George (2016)

Table 1 shows that in academic research in the field of Business and Management several concepts are being used. In the definitions used for a data-driven culture is the association with decision making constantly recurring. The definition used in this paper is that of Gupta and George (2016), mainly because this definition clearly contains the decision-making element that recurs in all the other definitions and because this definition shows the importance of the data being used in the entire organization (from top-level executives till lower-level employees). Besides that this definition elaborates on the article of McAfee and Brynjolfsson (2012) which is also a lot mentioned in papers referring to the concept of a data-driven culture. The definition of Gupta and George (2016) is a very comprehensive one and is cited by a lot of well-read papers. Furthermore, the article of Kiron et al. (2013) is less applicable, because even though it is cited in several papers for a definition of a data-driven culture. They refer with that definition in their own paper to a "Data-Oriented Culture" and is therefore less applicable for the concept of a data-driven culture.

The fact that there are several different concepts being used in the literature around a data-driven culture is partly due to the fact that concepts are often used interchangeably like the concept of a 'data-driven culture' and a 'big data culture'. In short, big data is the basis as it is a form of information that, when it is derived, transformed and used in the right way and in the right circumstances, is incredibly valuable for organizations. Because big data has the potential to lead to; competitive advantage (Mosig, Lehmann, & Neyer, 2021; De Medeiros & Maçada, 2021), more innovation (Chatterjee, Chaudhuri, & Vrontis, 2021), better performance (Akter, Wamba, Gunasekaran, Dubey, & Childe, 2016; Vidgen, Shaw, & Grant, 2017; Brynjolfsson, Hitt, & Kim, 2011) and act as an important driver to help firms in utilizing product development opportunities (Duan, Cao, & Edwards, 2020). Organizations are really interested in implementing a data-driven culture. The challenge of getting the people involved to change the culture is way bigger than the technological issues concerned with creating a data-driven organization (Bean, 2018). To (optimally) exploit the potential benefits of becoming a data-driven organization, a data-driven culture is crucial. To become a data-driven organization, several big data analytics capabilities are needed (BDAC). One of the capabilities needed is the aforementioned big data predictive analytics (BDPA) (Grover, Chiang, Liang, & Zhang, 2018). As mentioned in the article of Shamim et al. (2019), who did partially quantitative research on big data culture, qualitative research could explore the concept of a data-driven organizational culture more in-depth. Culture is the crucial aspect for an organization to fully utilize its big data capabilities and benefit from being data-driven. The culture of a company is a very

important aspect of employee engagement, well-being and thriving. That is why it is essential to have a look at what creating a data-driven culture does with employee thriving.

2.3 Employee Thriving

Thriving is defined as a positive psychological state characterized by a joint sense of vitality and learning. Employees who feel thriving experience personal growth by feeling energized and alive (Spreitzer, Sutcliffe, Dutton, Sonenshein, & Grant, 2005). So, vitality and learning are the two elements that make up the concept of thriving. Positive emotions connected to having energy and zest are referred to as vitality (Bernstein, 2004; Nix, Ryan, Manly, & Deci, 1999). The acquisition and use of new information and abilities make up the other element of learning (Elliott & Dweck, 1988; Rego, et al., 2021). Thriving is particularly interesting because it is beneficial for the organization as well as for the employee. Employee thriving is very important for organizations, because it has a positive effect on firm performance and is crucial to sustain firm performance especially in these times of a fast-growing and competitive knowledge-based economy (Walumbwa, Muchiri, Misati, Wu, & Meiliani, 2018), employee thriving helps organizations to retain its talent and sustain competitive advantage (Abid, Zahra, & Ahmed, 2016) and employee thriving is positively associated with career growth and negatively associated with distress (Um-e-Rubbab, Faiz, Safdar, & Mubarak, 2021). That work can be a huge cause of stress has already been known for quite a long time (Karasek Jr, 1979; Sonnentag & Frese, 2013) but in contrast, a job can also contribute to personal growth and well-being of the employee (Bakker & Schaufeli, 2008). There are for example findings that employee thriving is positively associated with self-development (Paterson, Luthans, & Jeung, 2014), which is a crucial mechanism for increasing job performance, while also mitigating burnout and improving health (Spreitzer, Porath, & Gibson, 2012). So it is in the interest of both the employer as well as the employee to strive for thriving.

The article by Spreitzer et al. (2005) shows several enablers for employee thriving. The first enabler of employee thriving that Spreitzer et al. (2005) mentions is *enable decision-making discretion.* Data could help with creating more decision authority for employees when they are allowed to take more decisions based on the data they have. What is essential for having the benefits of the data and giving employees more authority to make decisions, is to give employees the right capabilities to interpret the data (Wade & Hulland, 2004; Rodríguez-Mazahua, et al., 2016). One of the keys to successfully implementing what was stated above is to invest in education and training for your personnel (Brown, Chui, & Manyika, 2011).

Therefore it is very important that employees get involved in all the data, so they can make informed choices and that they can defend these decisions based on the data. The second enabler of employee thriving is *to provide information about the organization and its strategy.* When employees are well-informed by their superiors, they feel more engaged in the ups and downs of the company (Constantin & Baias, 2015). Data is the ideal tool to share information about the organization, however it is crucial that the data gets properly explained by the superiors or external consultants. Also, the strategy could be partially explained by data, as it can show where you want to go as an organization. The third enabler that is mentioned in the article of Spreitzer et al. (2005) is to *minimize incivility.* According to Spreitzer et al. (2005, p. 159), this leads to a: "positive, respectful climate (that) spurs energy to participate and contribute to the organization." Dashboarding can help employees, by giving them the feeling that they matter and by showing and discussing data so they can form an opinion about it (Gitlow, 2005). This helps employees in trying to contribute to the organization. The fourth enabler of employee thriving is to *provide performance feedback.* Big data has the potential to give feedback to employees in a fairly straightforward manner. Important for good feedback is that the data is shown in a way that it is easy to understand for the one who gets the feedback (Sharma & Hosein, 2020). The fifth enabler of employee thriving is *to promote diversity.* It refers to organizations that are committed to enhancing employee inclusiveness, that are accepting those who appear different from the majority or mainstream and encouraging the view that diversity makes an important contribution to the organization and develop a climate which promotes diversity (Spreitzer, Porath, & Gibson, 2012). It is hard to make an expectation in what way a data-driven culture could promote diversity. Potentially, data could endorse that diversity in teams potentially ensures better performance, more innovation and a positive working atmosphere (Kochan, et al., 2003; West, 2002).

Porath et al. (2012, p. 253) elaborated on the literature on thriving with adding some other potential enablers of thriving. The first concept that Porath et al. (2012) adds to the literature on employee thriving is *positive affect.* The second concept that could enable thriving is *learning goal orientation.* Porath et al. (2012, p. 252) state that: "People with high learning goal orientation view skills as malleable (Martocchio, 1994) and focus on developing the ability to achieve future tasks (Button, Mathieu, & Zajac, 1996; Farr, Hofmann, & Ringenbach, 1993). In particular, employees with a learning goal orientation are more likely to pursue self-development (Farr, Hofmann, & Ringenbach, 1993) because they are interested in increasing competency and are motivated by growth and development needs (Brockner & Higgins, 2001)."

A data-driven culture could potentially be beneficial to learning goal orientation because it has the potential to give specific personal feedback to employees (Sharma & Hosein, 2020). So that they can see where they can improve and see how they improve overtime when the data is regularly being updated and interpreted. The third concept potentially enabling employee thriving is *a proactive personality*. Data has the potential to show where someone can improve oneself. Someone with a proactive personality would take this data-driven advice to heart and is willing to educate oneself to make improvements where needed. The last concept mentioned in the article of Porath (2012) that enables thriving is the concept of *core self-evaluations*. As stated earlier, data has the potential of giving very specific and clear feedback when it is being collected, processed and interpreted in the right way. This data-based feedback could set the boundaries for employees to create self-evaluations that are potentially very important to thrive within the organization. Leadership is a key concept in employee thriving (Niessen, Mäder, Stride, & Jimmieson, 2017) and in changing, developing and maintaining an organizational culture (Krapfl & Kruja, 2015). That is why it is relevant to take the concept of leadership into account when looking at culture and employee thriving.

2.4 Leadership in Relation to Employee Thriving and a Data-Driven Culture

This section looks at the relationship to both the concept of employee thriving and the concept of data-driven culture. In implementing a data-driven culture, trust is a key factor (Anderson, 2015) as well as in employee thriving (Carmeli & Spreitzer, 2009). The factor *trust* in becoming a data-driving organization and creating a data-driven culture can go two ways. The first way is that as much as possible data is being shared, democratized and clarified. If you do this in the right manner it will enhance trust (Patil & Mason, 2015). The other way is that if organizations are not open and transparent about the data that is being collected, processed and interpreted, this would have a harmful effect on the trust of employees and thus have a negative effect on employee thriving and becoming a data-driven culture. Furthermore, if employees feel "checked" by the abundant data collection and analysis, they might feel distrusted by their supervisors or organization.

Looking at the meta-analysis by Kleine et al. (2019) there are several factors that influence employee thriving which are potentially dangerous for creating a data-driven culture. One of those factors that influence employee thriving is job/work engagement. Job engagement is influenced by, for example, autonomy (Malinowska, Tokarz, & Wardzichowska, 2018). When the data gets a more important position above the experience and intuition of the manager or

employee involved they may feel undermined in their (decision) authority, which potentially influences their job engagement and thus employee thriving. Leadership and leadership style are crucial aspects in the process of as well becoming data-driven (Windt, Borgman, & Amrit, 2019) as in employee thriving (Niessen, Mäder, Stride, & Jimmieson, 2017). Several studies identified certain leadership styles that promote employee thriving. Shahid and Muchiri (2019) found that an *authentic leadership* style can have a significant influence on employee thriving; authentic leadership is also positively related to employee creativity (Xu, Zhao, Li, & Lin, 2017). The definition of an authentic leadership style used in this paper is: "a pattern of leader behavior that draws upon and promotes both positive psychological capacities and a positive ethical climate, to foster greater self-awareness, internalized moral perspective, balanced processing of information, and relational transparency on the part of leaders working with followers, fostering positive self-development" (Walumbwa, Avolio, Gardner, Wernsing, & Peterson, 2008, p. 94). Li et al. (2016) found that *empowering leadership* has a significant influence on employee thriving. Empowering leadership is conceptualized as power being shared with subordinates through a series of job leadership behaviors. Including, emphasizing job meaning, providing decision-making autonomy, expressing confidence in employees' work, and removing hindrances from employees' jobs. Thereby improving employees' work-related intrinsic motivations and removing feelings of helplessness (Zhang & Bartol, 2010).

Furthermore, Walumbwa et al. (2018) found that *servant leadership* is positively related with employee thriving, more specific on a unit-level of thriving at work. Servant leadership emphasizes the importance of the development of others; this is achieved through helping followers to realize their full potential by prioritizing the fulfillment of their needs (Greenleaf, 2002). Servant leaders achieve this through active listening, empathy, affirmation, confidence building, and by providing feedback and resources while nurturing the broader potential of individual members (Greenleaf, Servant leadership, 1977). Besides that, Li et al. (2019) found that the inclusiveness of a leader was positively related with employee thriving. This study refers to inclusiveness as the core of *relational* leadership where leader inclusiveness focuses on leaders' availability, openness and accessibility in their interactions with employees (Carmeli, Reiter-Palmon, & Ziv, 2010).

Recent research of Lin et al. (2020) found that *transformational leadership* is highly associated with employee thriving. Similar to authentic leadership, in transformational leadership the interaction between the employee and the leader is critical (Dust, Resick, & Mawritz, 2014). Transformational leadership usually advocates learning, encourages innovation and promotes

extensive information sharing (Qu, Janssen, & Shi, 2015). One could argue that a cultural 'transformation' requires a transformational leader who has charisma and inspiration to successfully implement new changes with the relative full support of their workforce (Saunders, Lewis, & Thornhill, 1997). There are four dimensions of transformational leadership identified by Bass (1998) and later elaborated on by Bass and Avolio (Bass & Avolio, 1990) consisting of *idealized influence (charisma), inspirational motivation, intellectual stimulation and individualized consideration.* Gathungu et al. (2015) states that leaders who enable effective organizational change by defining the need for change, creating and expressing a new vision, and mobilizing employee commitment to this vision, have a transformational style. Figure 1 shows a potential mediating and potential moderating relationship between the concepts of leadership style and employee thriving. This relationship is still a bit uncertain because there is no clear and exhaustive framework yet about how these specific concepts could be related.

Looking at the leadership styles related to employee thriving and (change towards) data-driven culture, one could suggest that a transformational leader is largely positive for employee thriving and cultural change. There are potentially more types of leadership styles that could enhance cultural change and employee thriving, but perhaps do not embrace a data-driven culture. It is also possible that with certain types of leadership there is tension between cultural change and employee thriving. Because there is still a lot of room for research around this topic, we chose to use a qualitative research method. By virtue of using this method, we are able to see what happens during the process of becoming data-driven and will try to develop a framework.
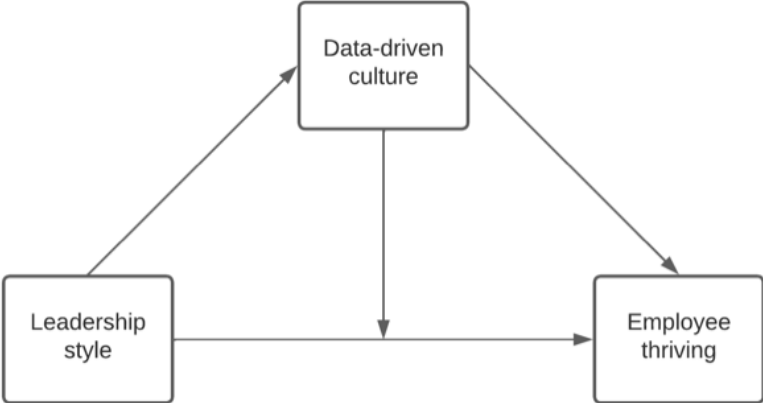

Figure 1 The conceptual model

3. Methods

3.1 Research Design

Data-driven culture and employee thriving are fairly new topics in the academic literature, because the relationship between these topics has hardly been studied yet, which makes this topic well-suited for a qualitative study (Edmondson & McManus, 2007). Qualitative research is known for its richness and potential for discovery (Gioia, Corley, & Hamilton, 2013), which enables us to get a deeper insight into how various already studied concepts are related to each other. Besides that, qualitative research provides the possibility to describe a phenomenon from the participants view (Orb, Eisenhauer, & Wynaden, 2001). Several managers and employees working in organizations that are actively working on creating a data-driven culture were interviewed as well as managers and employees of organizations who are almost at the end of the process of creating a data-driven culture. We choose an inductive approach for this study, because the research question consists of relatively new concepts and these concepts are not studied yet in relation to each other.

3.2 Research Instruments

The choice was made to use semi-structured interviews with open-ended questions, because this method has the potential to see the full picture and to reflect on what happens during such a process. Such interviews can also show how a data-driven culture changed the way of working, its effects on employee well-being, the benefits obtained from having a data-driven culture and the challenges an organization faces when implementing a data-driven culture. In semi-structured interviews, the interviewer has the opportunity to ask questions that emerge during the interview and in doing so can come up with new insights around the research topic (Miles & Huberman, 1994).

Previous studies on employee thriving from Spreitzer et al. (2005) and Porath (2012) helped to develop a semi-structured interview scheme for this study. These studies gave several enablers of employee thriving, which could be explored during the interview. The studies of Shamim et al. (2019) and Pugna et al. (2019) helped to illustrate data-driven cultures. Shamim et al. (2019) discusses several challenges in creating a data-driven culture. The study of Pugna et al. (2019) discusses, next to the challenges in creating a data-driven culture, managers' perceptions, understandings and attitudes relating to big data. This, in combination with the definition of Gupta and George (2016) on a data-driven culture, provides a good handle for looking at the

data-driven culture of the organizations that participate in this study. Besides the interviews, there will be observations during meetings. This could be helpful to get insight into potential problems managers encounter during the process of creating a data-driven culture and what managers/leaders do to implement a data-driven culture i.e. which leadership style they use and if they are aware of the leadership style that they use. Besides that, attendance at these meetings helps with developing the interview questions. Only the semi-structured interviews were used for the result section.

3.3 Participants

The study is performed using the network of a Dutch-based consultancy firm, with approximately 70 employees, that helps organizations to work smarter, more effectively and more efficiently with data (Organization A). For over 20 years they have helped other organizations with training and support to create a data-driven culture based on knowledge and skills. Participating organizations were in the process of developing a data-driven culture with the help of the Dutch-based company or already received the help of the Dutch-based company and are currently further developing the data-driven culture by themselves. An overview of the participating organizations and the role of the people that were interviewed can be found in Table 2. The targeted organizations were based in various industries including also (non-profit) public authorities. We picked such a wide variety of organizations in order to create a comprehensive picture of the effects of (creating) a data-driven culture on employee thriving. It also helps to find potential differences in implementing a data-driven culture in several industries. The interviews were conducted in Dutch or English depending on what the interviewee preferred.

For the selection of organizations several criteria were being used. First, all the departments in the organization had to use data and be data-driven. The second criterion was that the data should be used throughout the entire organization. This means that in all of the organizational layers they should work with data and are developing a data-driven culture. A third criterion is that the organizations participating in this study should have already developed a data-driven culture or are currently in the process of developing a data-driven culture. The fourth criterion is that the data should be used in at least a descriptive and predictive way, but also can be used in a prescriptive way (Berndtsson, Forsberg, Stein, & Svahn, 2018). Prescriptive entails that the data is used to make (semi-) automated decisions. The last criterion is that specialized data mining and visualization tools are being used e.g. Tableau, Alteryx, PowerBI, IBM SPSS or

Oracle Data Mining (Berndtsson, Forsberg, Stein, & Svahn, 2018). The criteria were discussed with the organization that provided contacts with organizations that developed or are developing a data-driven culture. Based on this discussion 4 organizations were selected. That organizations can be roughly divided into tech-based companies (Organization A and Organization B) and non-tech-based companies (Organization C and Organization D). In tech-based companies the core of their business model is based on technology like computers. Hence, a tech-based organization cannot exist without the use of computer technology.

The first organization (Organization A) is a consultancy firm that helps other organizations to become more data-driven and create a data-driven culture. They provide a wide range of services in order to help organizations such as; training, consultancy, data-maturity scans and data-literacy tests. The organization had a rapid growth in the last couple of years resulting in 75 employees at present and two offices in the Netherlands. The company has existed for over 20 years and uses existing data visualization software, for example PowerBI and Tableau, to help clients work data-driven. Although they help other companies with getting more data-driven, unlocking the data and get insight in the data. They are currently working on getting their internal data supply in order. Due to the growth over the last few years they had no focus on their internal figures, they had no KPI's and lost track in that sense. So they are currently busy with an internal project to create a data-driven culture as they promote it by themselves.

The second organization (Organization B) is an ecommerce company founded in 2016 where you can easily order window frames. They do not produce the frames by themselves, but they are a platform that looks for the best option based on quality, delivery time and price based on the customer requirements. They are doubling their revenue each year. The number of employees is also growing rapidly with currently 35 employees and over 10 unfilled vacancies. They use Tableau as the software tool to get more insight into several parts within the organization for example; the amount and reason of returning goods, the amount of false deliveries (i.e. broken frames, damaged frames), the amount of late deliveries, etc. As they deliver directly from the production facilities, this is also very useful information for that production facility. They are now also using this information in that way by, for example, negotiating discounts in return for information. They also measure more internal information like the number of successful complaint settlements per employee, the amount of returning customers, revenue per customer, etc.

The third organization that is participating in this study is Organization C. Organization C is a conglomerate of several Dutch municipalities that facilitates the tax collection of these municipalities. They also use Tableau as a tool to, for example, automatically generate the tax assessment of houses and get insight into the processing speed of certain cases and certain employees.

The fourth organization (Organization D) is one of the biggest construction companies of the Netherlands based on both number of employees and revenue. They use Tableau to get more insight in how the 130 operating companies are performing and, for example, where they buy which products at which prices. Tableau helps them to get a visualization of this information and to make decisions based on this information. Both operating companies as well as the headquarter use this information. Control from headquarters of the financial figures of certain operating companies has become easier by simply opening dashboards instead of having to prepare extensive analyses in advance. Organization D seems to be the outlier based on the size of the company in both revenue and amount of employees. However, the comment should be made that the interviews were only held with employees at the headquarter. Making use of only participants from the headquarter ensures that Organization D is not a real outlier for this study.

The data collection at these organizations is discussed more in-depth below. There was no preference for a certain type of organization as that the organization should be in a certain industry or that it should be profit-seeking. We chose to do interviews at 4 organizations so that potential similarities and potential differences between organizations can be seen and documented. In addition, we chose to conduct the interviews with both managers as well as the employees on the work floor, so that potential differences between them and how they feel about the change towards a data-driven culture can be found. The managers were part of the meetings with consultants who help the organization in becoming a data-driven organization and creating a data-driven culture and therefore directly involved in the process of creating a data-driven culture. All the managers were at the head of a team or department in an organization that tried to implement a data-driven culture. The determination of who was interviewed was done based on consultation between Organization A and the other organization. To get the broadest and best possible picture, we asked to interview 2 managers and 2 employees at each of the participating organizations.

Table 2 Definitions used in the literature to describe a data culture

Company	Name + role[1]	Gender	Age range	Respondents function
Organization A Tech-based ± 70 employees ± 13 million (Revenue) Sector: Consultancy Service	M1-A (Manager)	Female	30 – 39	Inside Sales manager
	M2-A (Manager)	Male	40 – 49	Talent & Resource manager
	M3-A (Manager)	Female	30 – 39	Manager Academy
	E1-A (Employee)	Male	30 – 39	BI Consultant
	E2-A (Employee)	Male	30 – 39	BI Consultant
Organization B Tech-based ± 50 employees ± 50 million (Revenue) Sector: Ecommerce Platform	M1-B (Manager)	Male	30 – 39	Head of customer service and business developer
	M2-B (Manager)	Male	40 – 49	Head of operations
	E1-B (Employee)	Male	20 – 29	Product and service employee
	E2-B (Employee)	Male	20 – 29	Marketeer
Organization C Non-tech-based ± 100 employees ± 12 million (Revenue) Government Service	M1-C (Manager)	Male	50 – 59	Business controller. (Managing Director per 1 June '22)[2]
	M2-C (Manager)	Male	20 – 29	Advisor Information
	E1-C (Employee)	Female	40 – 49	Employee WOZ-value
	E2-C (Employee)	Male	40 – 49	Employee tax collection
Organization D Non-tech-based ± 17000 ± 6.2 billion (Revenue) Sector: Construction Product	M1-D (Manager)	Male	40 – 49	Team leader Data
	E1-D (Employee)	Male	20 – 29	Implementation specialist

Note. Product, Service or Platform is based on the core of the organization's business activities.

[1]First letter (M or E) is the role (Manager or Employee), followed by a number and the last letter is the organization (Organization A till D). E.g. E2-B is Employee 2 of organization B.

[2]Interviews were held in the months April and May 2022.

3.4 Data Collection

Before we conducted the interviews, we conducted field visits to observe project and intake meetings between the consultants helping with the implementation and the organizations that were in the process of creating a data-driven culture. These observations helped to notice issues organizations are facing during this process. Attendance at these observations gave us the possibility to form questions about issues that arise, as well as asking about those issues during the interviews. This helps to create an even more comprehensive picture about how employee thriving, a data-driven culture and leadership are intertwined concepts. Field notes were taken during the meetings by the researcher himself. These field notes helped us with clarifying statements during the interviews and providing a rich context for analysis (Strøm & Fagermoen, 2012). The field observations did not influence the interpretation of our interview data. Fieldnotes were only used to identify several issues in creating a data-driven culture upfront.

For this research, 15 semi-structured interviews were conducted. The interviewees per company consisted of interviews with employees and with managers/leaders. For the interviews with managers and the interviews with employees, different interview guides are used. The interview guides can be found in Appendix A1 (Interview guide Managers) and Appendix A2 (Interview guide Employee). The interviews lasted roughly between 45 minutes and 60 minutes. To prevent misinterpretation and to make sure statements could be validated, all the interviews were audio-recorded and transcribed, with approval of all the participants. The interviewer made annotations when something remarkable was being said or when the interviewer had the feeling the topic should be discussed more in-depth. The questions asked during the interview concerned different areas that were important for this study. The main topics were data-driven culture, employee thriving and leadership style. All the interviews were held in person, face-to-face and at a place chosen by the interviewee. In order to be well-prepared before conducting the interviews, we used open access information to gather some background information about the organization and the interviewee. To stay as neutral as possible about the organizations that conducted in the interview, we did not discuss these participating organizations with the consultants in-depth beforehand.

3.5 Data Analysis

With an inductive approach, we are trying to develop a framework around the earlier mentioned research question (Ketokivi & Choi, 2014). Although there is already quite a lot of literature to be found around the concepts mentioned in the research question, there is no framework yet.

Before the data could be analyzed, we transcribed the data, which was then analyzed using Thematic Analysis (Braun & Clarke, 2006). For organizing the data in a structured way, the Gioia-method has been used (Gioia, Corley, & Hamilton, 2013). The first phase of the thematic analysis from Braun et al. (2006) is transcribing the data and reading and re-reading the data noting down initial codes. Phase 2 is to generate initial codes by highlighting interesting data in a systematic way (Braun & Clarke, 2006). This corresponds with the so-called "1st-order" concepts of the Gioia-method (2013). We created "1st-order" concepts in line with the Gioia-method by performing initial data coding. This is a way of open coding where all potential relevant statements were written down per interview. After creating the first codes, the third step of thematic analysis was conducted: searching for potential themes (Braun & Clarke, 2006). This is similar to the "2nd-order" themes of the Goia-Method. These 2nd order themes should be formed by several quotes supporting that theme. The last step is to create aggregate dimensions based on the 2nd order themes. These dimensions are called "3rd-order themes" (Gioia, Corley, & Hamilton, 2013). The fourth step of the thematic analysis is to review themes. This step contains: "checking if the themes work in relation to the coded extracts (level 1) and the entire dataset (level 2), generating a thematic 'map' of the analysis" (Braun & Clarke, 2006, p. 87). The fifth step starts after having a satisfactory thematic map of the data (Braun & Clarke, 2006). In this step we search for the 'essence' of each theme that is created and define these themes. The final step in thematic analysis is building a data structure by once more analyzing the data, searching for examples and in doing so answering the research question.

To ensure that the coding happened in an open and transparent way, there was a second coder involved and the results were compared (Campbell, Quincy, Osserman, & Pedersen, 2013). Involving a second coder on all the interviews improves the data-quality and reduces possible subjectivity (Church, Dunn, & Prokopy, 2019). The second coder is another Master Business Administration student who is familiar with qualitative research methods, transcribing and coding techniques. The bachelor thesis of the second coder also consisted of a qualitative research method and he passed the course of Qualitative Research Methods in 2022. In this

course several qualitative research approaches and coding techniques were discussed in-depth, such as the Gioia-method among others. In order to give all the interviews the same approach, the second coder was involved in the coding of all the interviews. Notable differences in the coding were discussed and amended when needed. The second coder also helps to overcome the potential problem of observer biases. As we attended several meetings between the consultants and the adopters of a data-driven culture there is a potential of a certain prejudice when conducting the interviews. This could give us a certain bias that could come back in the coding. No significant changes were made in the data-structure after codes were discussed with the second coder. There were only some small changes made in the description of the, mostly first-order, codes.

4. Results

In this section the 1st- and 2nd-order themes found based on the qualitative data analysis of the semi-structured interviews will be discussed and presented as structured through the 3rd-order aggregate dimensions. Table 2 shows a summary of the themes found. In Appendix C can quotes been found that support the first-order themes.

Table 2 Data-structure		
First-order codes	**Second-order themes**	**Aggregate dimensions**
Persistence in start using and continuing to use data	Managerial behavior	Leadership style
Explanation why you want to work data-driven		
Demonstrate exemplary behavior by working in a data-driven way as a manager		
Share a clear vision about where you want to go with the data-driven culture		
Being transparent about which data is being used and why	Change leader characteristics	
Being enthusiastic about the transition towards a data-driven culture		
Show that you can add nuance to the data when needed		
Negative job related consequences for employees	Anxiety	Employee thriving
Employees feeling checked via data		
Creating more space for creativity and autonomy for employees	Positive consequences for employees	
Ensuring recognition		
Providing individual feedback based on the data		
Accelerating the learning curve by using more data		
The emergence of a more corporate/professional culture	Cultural clashes in the organization	The transition towards a data-driven culture
Losing innovativeness because of a more firm and uniformed process		
The need to hire new employees in order to create a data-driven culture	Creating a sense of urgency	
The need to hire an external party in order to create a data-driven culture		
Prioritizing the creation of a data-driven culture		
Celebrate small successes during the transition towards a data-driven culture	Adoption of the data-driven culture	
Involving the end-user to ensure the creation of a data-driven culture		

Note. The bold-faced first-order themes were more prominent in the tech-based firms, whereas the italicized first-order themes were more prominent in the non-tech firms.

4.1 Leadership Style

4.1.1 Managerial behavior

The interviews show that during the transition of a data-driven culture different leadership styles should be used in order to ensure a successful implementation. During several moments within the process of the implementation of a data-driven culture, more **persistence** and guidance is needed from managers. *"By nature people put their foot down at such changes. One important way to overcome this is persistence. (M1-D)"*. Their persistence is needed in order to let employees start working data-driven, but also in order to ensure continuity in the use of data. Furthermore, it is important to **explain** to your employees why you make certain decisions; *"Crucial in implementing the data-driven culture is stress the importance for the business. You have to take your employees by the hand and explain what you are doing in order to let them embrace the change (M2-B)"*. There should be a good balance between a top-down pressure for implementing a data-driven culture from the managerial side, as well as a sense of urgency and the recognition that the transition is important from the employee's side. In order to create this, a manager stated he believes it is important to: *"stay constantly in contact with your employees and talk to them about what they perceive as important and what they like to see. (M1-B)"* Crucial for the implementation is that the management show exemplary behavior. *"When there are clean dashboards with the right information and you still walk into a meeting with your printed excel file on an A3 format you can't expect from your employees that they work with the dashboards (E1-D)."* An aspect of leadership in the implementation of a data-driven culture is **disseminating a clear vision** about this topic. This is emphasized by managers as well as by employees. A shared and accepted vision is important, because it keeps the process of change on track at the time of changes in the management teams. *"In the last 4/5 years I had 4 different supervisors ... I don't know the vision of a data-driven culture of this organization. This hinders the implementation of a data-driven culture (E2-C)."* During the interviews it was not asked whether there is a certain order in the codes. Although, some interviewees suggested that the whole process should start with disseminating a clear vision.

4.1.2 Change Leader Characteristics

There are also some particular characteristics mentioned that are important for a leader in the change when trying to implement a data-driven culture. Besides persistence, **transparency** is also mentioned as a driver for the implementation of a data-driven culture. *".... I miss transparency about where in the process we are (M1-A)."* In addition, it is important for the

leaders in the transition to be **enthusiastic** about the change and to stay close to the enthusiastic early adopters and the employees that promote and embrace the change; *"the pioneers of the change (early adopters) should be engaged in the process so that they promote that in their teams (M1-D)."* For leaders, it is important to recognize and highlight that the insight that data provides is not being used as a stick to beat you with, but rather as information that helps to improve the performance of the organization as a whole. Part of that is the need for managers to show they can bring the **nuance** and place data in context when that is required; *"… it is important to explain why you do certain things. It is important to know the story behind the figures (M2-A)."*

4.2 Employee Thriving

Besides leadership style, we also looked at how a data-driven culture could enhance employee thriving. To get more insights into this, we asked the interviewees about how they felt under the change towards a data-driven culture. Remarkably, managers were very concerned about the potential negative effects and the reaction of employees, whereas the interviewed employees show that they are very interested in change and admire the change when implemented in the right way. An often-mentioned concern among managers and employees is that of **anxiety**. One of the fears that managers and employees see for colleagues is that: *"… employees can feel checked by the data in a way that it could give insights about their productivity and efficiency (E2-C)."* Although none of the respondents experienced a sense of fear themselves, it is often mentioned as a potential problem. Another fear that is often mentioned is the fear of employees **losing their job**, because data takes over their work: *"as a manager it is your task to show employees that when their job is being automated it doesn't mean they are not valuable anymore. They just need another position or job in the organization (M1-C)."* In none of the interviews it was noted that employees felt checked through the data or were anxious about their job. In contrast they were happy that tasks that were perceived as boring, repetitive and error prone could be done by the computer. In addition, the insights data provides to managers and directors can be used for **recognition** of the work done by the employees; *"I wish I was more checked by my supervisors through the data (M1-A)."* When the data is also available for employees it enhances their **creativity and autonomy**. *"At the moment I make decisions based on some rough calculations. When I have more numbers I can better back my decisions. This gives me more autonomy (M3-A)"*. Employees come to their supervisors on their own account to ask how they are performing compared to the KPI's: *"Often several colleagues come to me to compare their results with the KPI's and with other colleagues. To learn and to improve on*

things where they can do better (E1-C)". In order to get right and clean data out of the system, it is crucial to put data in the system in a structured and **transparent** way. Delivering the data in a structured way causes objections from some employees. This is a risk because 'garbage in means garbage out', which means that you are steering on wrong data. Several employees thrive on more freedom in this sense; *"Several, mostly more experienced, employees left our company. They could not ground in a more professional environment (M3-A)."* Data ensures that the work that you do becomes more visible. The fact that through the data a lot is being visualized and is insightful, provides opportunities to give more **individual specific feedback.** This is perceived as very valuable for the person that receives feedback. With feedback comes also a bit more mature for the employees. *"Due to the available figures it is transparent for everyone what they contribute to the organization (M1-A)"*. The interest of employees in the data is very clear and they realize better than anyone what kind of data is available in the organization, but is not used and which tasks could be done better or easier through a data-robot. *"I think we can do a lot more with data. I am also in favor of as much automation as possible. Humans will soon be here only to check the data and to steer it in the right direction and context (E1-C)"*. Although individual specific feedback appears to be in the line of recognition is there an important difference between the two. Feedback is always given and often at specific 'feedback moments' whereby it is deemed important that data is then also included in those conversations. Recognition can take place at any time and is the 'simple' confirmation to employees that they are doing a good job. Data can relatively easily provide this confirmation. An additional important side effect of data is that it could enhance **the learning curve** of employees. *"Provided you use the data correctly. Data can quickly give you insights you can learn from. Analyzing, learning, and improving creates a higher energy level among employees. (M3-A)."* Using data and the automation of certain repetitive tasks also have a positive influence on the energy level of employees. *"The data helped in such a way that he didn't have to do the boring work anymore, but that the boring work is already done by the system every morning. This gives him more pleasure in his work (M2-C)."*

4.3 The Transition Towards a Data-Driven Culture

What is revealed is that a data-driven culture leads to a more **professional and corporate culture**; *"Freedom and happiness, which civil servants are known for ... We have become more business-like because of the data (E1-C)."* This is potentially harmful because a more professional and corporate culture **could harm the innovativeness** of a company. *"In order to keep our entrepreneurial culture, we still need cowboys, but you have to make sure you have a*

good mix. Data-driven is not something everyone should do… (M2-B)." In order to really create a data-driven culture and show the urgency to employees, it is highly recommended to **hire new employees** who are familiar with working with data. *"We brought in totally different people. The average person was the "real IT person." Most of the people who joined didn't even have an IT background anymore (M1-D)."* Although this can sometimes lead to friction; *"What happened next at IT is that they wanted nothing to do with it. The people in the existing IT department found it very annoying, because all at once there were a few people with, what they thought were big mouths, making demands and they thought we should do things differently. This change was very difficult for the existing IT department (M1-D)."* The need of hiring new personnel as well as **the need to hire an external party** helps to show to employees that it is a serious issue that has priority in the strategic agenda of a company. To make the change it is important to **celebrate and share every little success** you achieve. "*People who see something, adopt it and get on with it quickly. Another group sees the light a bit later, but then doesn't want to do anything else. In a change, you can't go through it all at once. That is why we start small, with a pilot for example (M1-C)."* With every small step you take, the next step will be bigger and easier in order to create a data-driven culture. Sharing results and sharing successes helps to create a more positive vibe around the change towards a data-driven culture *"So we also have a success board and once every 6 weeks a departmental meeting where these successes are also shared (E1-D)."* Another important aspect that ensures the change is widely supported in the organization, is to actively **involve the end-user**. Although the end-user is not fully aware of the potential data has most of the time, they are conscious of what data they are looking at each morning; "*They didn't know what's possible in terms of data, but they know in their heads pretty well of gosh what am I looking at every day. In the morning when I start up my laptop I look here, here and here. (E1-D)."* By incorporating the end-user right from the start, they also start thinking by themselves about tasks that could be more efficient with the use of data. So just coming up with a dashboard for employees does not help in order to create a data-driven culture. You should create the dashboards with the employees. The role of management is to keep track of which dashboards are created so that there is no proliferation of dashboards. This goes hand-in-hand with the earlier mentioned need for a clear vision from the management on the creation of a data-driven culture. The corporation of end-users in the creation of the data-driven culture is crucial, but should always be guided through the managers. Just like the fact that managers, when **prioritizing** creating a data-driven culture, should also act in that way. When the managers do not act like it is really important for them, a kind of cynicism arises that hinders the change towards a data-driven culture; *"I don't know if it's a priority with the*

management either. It doesn't look like it so then I'm okay with it. Then I'm not going to put any further effort into it. (M1-A)".

4.4 Differences Between Industries

Table 2 shows the differences between organizations when striving for a data-driving culture. The codes mentioned in Table 2 are based on common illustrative quotes from all the interviews, but an annotation needs to be made that not every code is equally applicable for both tech-based companies and non-tech-based companies. A bold-faced first order theme was more prominent in tech-based firms, whereas a italicized first-order theme was more prominent in the non-tech-based firms. The distinction between which first-order themes are more relevant for tech-based companies and which are more relevant for non-tech-based firms is based on, in which interviews, those at tech-based firms or those at non-tech-based firms, clearly emphasized more quotes supporting the first-order theme. Not all first-order themes could be distinguished by the degree to which they were more or less important to a particular type of business. Organization D was based on firm size an outlier. However, we only held interviews with employees from the headquarter, making it an outlier to a lesser degree. No remarkable differences, in terms of the transition towards a data-driven culture and employee thriving, were found between organization D and the other participating organizations.

It is important to mention that on the one hand, there is a lot of overlap between industries regarding the implementation of a data-driven culture, the dangers, the opportunities, the impact of employees and the role of leadership in this sense. On the other hand, you also see differences as illustrated in Table 2. A general difference between the tech-based and the non-tech-based companies is **the speed of acceptance of the cultural change**. At Organization A and Organization B it was considered normal that things are measured: *"And accountability based on data is something I have absolutely no problem with, because at the end of the day I also get paid to be accountable for it (E2-B)."* Although it should be clearly noted that even in an ecommerce organization, the transition to a data-driven culture is not a one-two punch. At the construction company, as a long-standing construction company where data is not the core business, the fact that data is being collected needs to be communicated much more calmly and gradually. *"It's just hands off work.; 'Leave that dashboard at home because I know how to do it myself.' The mentality of: "I do know how things are." That really makes it a whole culture change that takes years. (E1-D)."* You also see this difference in the degree to which it is necessary **to enthuse people**. In a younger and more data-minded organization (tech-based

organization), the need to enthuse people appears to be far lower compared to an older organization: *"Above all, show enthusiasm and added value. Push does not work. Take them with you and show them what is possible, then you will often get them on board. (M2-C)."* When applying for a job at an ecommerce organization it is also demanded from you to work with data. *"If you apply for a job at a scale-up and especially an ecommerce organization it is nothing but normal to work with data and base decisions on data (E2-B)."* The results also show that **anxiety for losing their job or anxiety of be checked by the data** are not really issues in the ecommerce company. However, none of the respondents experienced this anxiety themselves, at the tech-based companies it was mentioned much less as a risk compared to non-tech-based companies. In contrast, the issue of **fear of losing the room for innovation and creativity** comes clearly to the forefront as a potential risk especially in tech-based companies.

Another remarkable more general difference is that the **more tech-based companies give themselves lower grades** when answering the question; "How would you rate the data-driven culture in this organization on a scale from 1 – 10 and why? A 10 is where you ideally want to go to and the number 1 is where you are now." The reaction of M2-B (Organization B) is illustrative of this; *"We are really not at a sufficient level yet."* M1-A (Organization A) endorses this insight *"A 3. I try to use a lot of data, but there is nothing overarching available and therefore I can't base my decisions on it yet. I have to pull it together."* Whereas the reaction from the non-tech companies in the sample was way more positive when they were asked to reflect on the degree in which they have a data-driven culture. M1-C (Organization C); *"I think people are working on it. I think we are working on it together, but on some points I think it is too easily pushed aside. The data I mean."* This is remarkable because these tech-based companies are, in terms of the data maturity (degree in which they have a data-driven culture), even further ahead compared to the non-tech-based companies. Although none of the respondents give themselves high marks (>7) there is a clear distinction between the non-tech-based companies (Organization C & Organization D) and the tech-based companies (Organization A & Organization B). While tech-based companies, in general, give themselves insufficient grades (<5.5), the non-tech-based companies give themselves, in general, a 'passing grade' (>5.5).

4.4.1 Differences in Leadership Style

In the non-tech-based companies the **need for persistence** is higher compared to tech-based companies. Persistence is needed during two moments in the process. The first is to start

working data-driven and the second moment when persistence is necessary is to ensure continuity in the use of data in order to make sure that a data-driven culture is created. In the more tech-based companies there is a more intrinsic motivation and interest with regard to what data has to offer and in the creation of a data-driven culture. That is why it is easier in tech-based companies to commence the creation of a data-driven culture compared to non-tech-based companies. At the non-tech-based companies more persistence is needed to start with the creation of data-driven culture and to continue this process; "*it's a construction company and it is pretty traditional ... most people are also just construction workers and not really IT minded, it is not only that they do not want to, but they also think they really can't do it*. (E1-D)." Whereas in a tech-based company there is already the interest and more intrinsic motivation to create a data-driven culture. This is also illustrated by this quote of E2-B "*I believe in data-driven work and I have an interest in it.*" **Being enthusiastic** about the change towards a data-driven culture is also more important at non-tech-based companies compared to tech-based companies. That employees at tech-based companies are intrinsically more motivated and interested in a data driven culture does not mean that there is not any need for enthusiasm from the implementers when trying to create a data-driven culture. So, the transition to a data-driven culture is initially easier at tech-based companies, but even at tech-based companies it is by no means a simple job.

4.4.2 Employee Thriving

In the creation of a data-driven culture, **ensuring recognition** is very important. The call for recognition is stronger in tech-based organizations. This is possibly the case because employees in a tech-based company in general have more knowledge about what data can show their superiors in terms of productivity for example. *"We are now only sharing turnover figures with colleagues, while you actually want to know how am I doing? So the employees themselves also want to have a lot more information about themselves. You notice that employees like to know how they are doing (M3-A)."* The people from non-tech-based companies seems to be less concerned about receiving recognition based on the insight coming from the data. This could be the case because they are less informed regarding what data can show and visualize, compared to the employees who work at a tech-based organization. When you are informed about these possibilities, you also do not miss the fact that you are being recognized based on the insights extracted from the data. In general, in both tech-based and non-tech-based

organizations, there can be employee thriving when implementing a data-driven culture. Of course, taking into account all the other factors affecting employee thriving.

4.4.3 The Transition Towards a Data-Driven Culture

The conducted interviews show that the **risk of losing innovativeness** and **the emergence of more professional culture** are bigger issues in tech-based companies compared to the non-tech-based companies: *"At the beginning was it more freestyling and a little more of a playground. Then it was a lot driven by gut feeling. Nowadays you need to support your ideas with data (E2-B)."* M2-B also endorses the difference in the extent to which the development of a data-driven culture is an issue in relation to a professional culture and the loss of innovativeness: *"You have to, but the ones who have been working here for a long time are really the cowboys. For them it was a big change, so we don't do it by feeling anymore, but we go to work based on facts and figures."* In the non-tech-based organizations this is a less severe issue based on the interviews. The non-tech-based companies are older and more mature organizations compared to the tech-based companies. It could be the case that more mature organizations already established a more professional culture and it is more normalized to back innovative ideas up with at least some data, whereas the younger tech-based organizations come from a culture with less standardization and more free entrepreneurship. The **need to hire new employees** in order to help the creation of a data-driven culture, which is mostly heard from the management side of non-tech-based companies. The hiring of new employees with more focus on data and a data-driven way of working helps them among other things to show to the other employees that the creation of a data-driven culture has priority and to accelerate the transition towards a data-driven culture: *"... What I notice is that in the last 4 years, there has been quite a change in the ICT Squad. There have been some other older guys replaced by some younger guys who are looking a little more at the business side (E2-C)."* The need to hire new employees in order to get focus and attention from employees on creating a data-driven culture is to a lesser extent an issue in tech-based companies compared to non-tech-based companies.

5. Discussion and Conclusion

This research aimed to answer the following research question *"How can the emergence of a data-driven organizational culture contribute, or oppose, employee thriving and what is the role of leadership style in this relationship?"*. We found that the creation of a data-driven organizational culture is a very challenging matter where several different aspects of leadership are required, such as persistence, transparency, enthusiasm and showing example behavior. It is also clear that, in both tech-based organizations and non-tech-based organizations, employees are quite enthusiastic about a data-driven culture and that a data-driven culture provides the opportunity for further employee thriving. However, it should be noted that an organizational change towards a data-driven culture can only be successful and lead to employee thriving when it is implemented considering the role of employees, by ensuring recognition for employees, providing individual feedback based on the data available and removing fears such as losing their job and being checked by the data. Furthermore, every organization requires, more or less, a different approach when implementing a data-driven culture and contributing to employee thriving: at Tech-based companies the need to enthuse people, show persistence to let employees start and continue work data-driven, and create a sense of urgency by hiring new employees are less important compared to non-tech-based companies. Whereas for non-tech-based companies the more professional culture and the risk of losing innovativeness when creating a data-driven culture is less of an issue. In the following section we explain how these findings contribute to the existing theory about employee thriving, a data-driven culture and the role of leadership.

5.1 Theoretical Implications

5.1.1 Leadership Styles Promoting Employee Thriving in the Context of the Transition Towards a Data-driven Culture

Figure 2 presents a framework that shows which leadership styles are more prominent when implementing a data-driven culture while also striving for employee thriving. Next to that, figure 2 shows factors that are likely to emerge in a data-driven culture and have a potential effect on employee thriving.
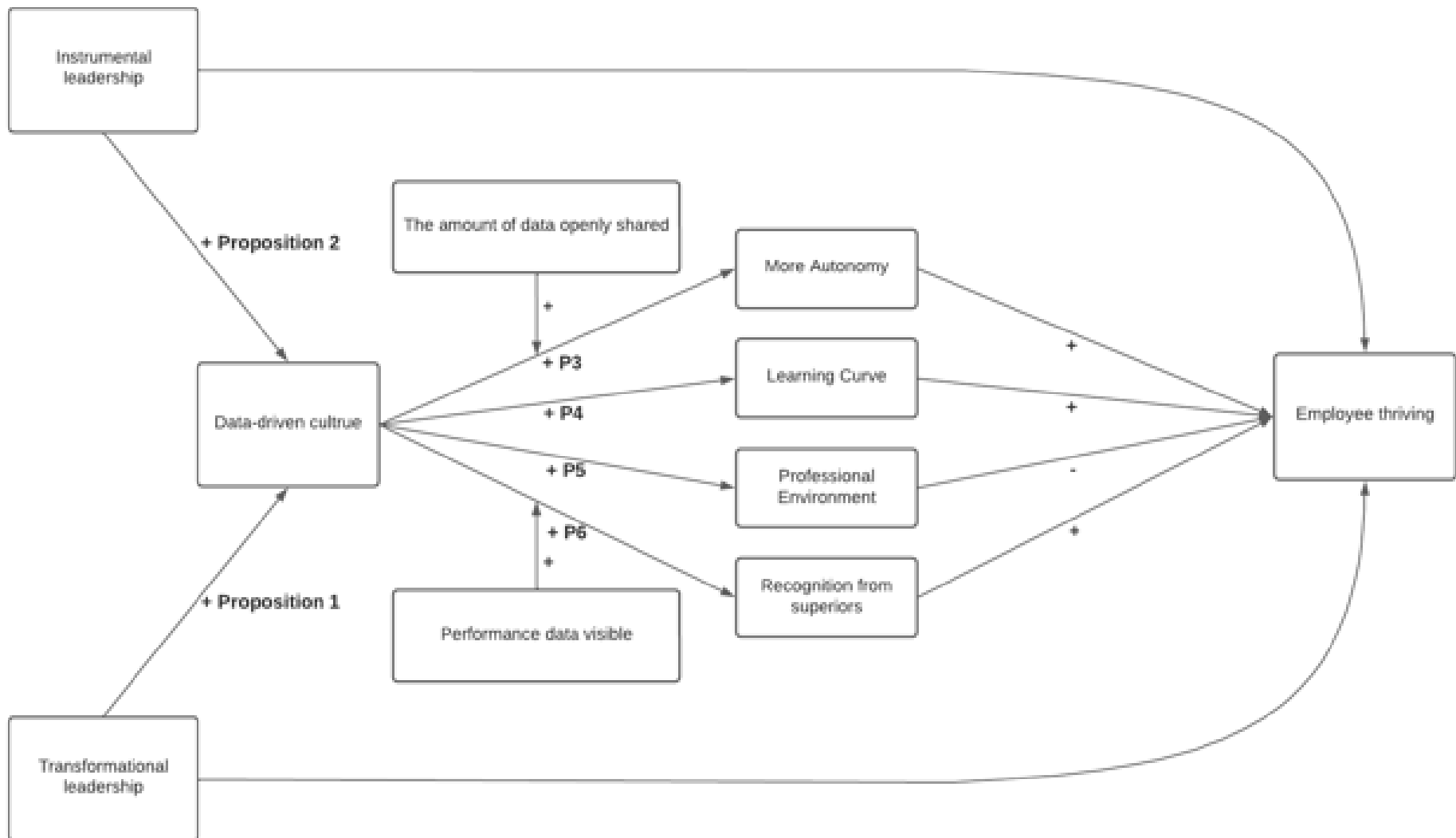
Figure 2 Conceptual model of leading the creation of a data-driven culture from employee thriving

The concepts presented in figure 2 are examples of what is expected to happen when a data-driven culture is implemented and how they might support or hinder employee thriving. This elaborates and partially overlaps with the already existing works by Spreitzer (2005) and Porath (2012) on employee thriving, but now applied into the context of a data-driven culture. In the literature several leadership styles have been noted that may support employee thriving (*authentic leadership, empowering leadership, servant leadership, relational leadership and transformational leadership*). Based on the results of this thesis, the leader in the process should be persistent and disseminate a clear vision in order to make the change towards a data-driven culture. This is in line with traits that are ascribed to a **transformational leadership style** (Bass & Avolio, 1990; Bass & Avolio, 1993). Clearly spreading a vision of data-driven work can be part of a charisma which is related to the idealized influence aspect of a transformational leadership style (Brown, Chen, & O'Donnel, 2017). Explaining what you are doing and why you are doing it (transparency) is important in the creation of a data-driven culture. This links to inspirational motivation, which is another key aspect of transformational leadership (Sadeghi & Pihie, 2012). For implementing a data-driven culture, it is important to show good example behavior to the rest of the organization. So idealized influence (act as a role model) is part of transformational leadership, which in turn can support employee thriving. It is hard to say in which way this persistence is also (potentially) positively related to employee thriving. However, it is also important that the persistence does not harm the relation with your employees which has further negative effects. Another aspect of transformational leadership is individualized consideration. Showing that you can place data in the right context (nuance) is a way of individualized consideration. Showing that you can place data about the performance of employees in the right context gives employees rest and (partially) overcomes anxiety issues of employees. The same applies to individualized feedback which is also a form of individual consideration. Furthermore enables a data-driven culture more autonomy for employees. According to Bass (1999) is fostering autonomy part of a transformational leadership style. This leads to the first proposition.

Proposition 1: The relationship between transformational leadership and employee thriving is partially mediated by a data-driven culture.

The leadership characteristics of being transparent and enthusiastic are relevant when implementing a data-driven culture and striving for employee thriving. Although aforementioned characteristics do not necessarily belong to a certain leadership style, providing

(individual) feedback is part of **instrumental leadership** which aligns with the initial codes about being transparent and showing that you can bring nuance when it is needed. Despite the fact that instrumental leadership is not known as an enabler of employee thriving in the literature, some of the initial codes are in line with characteristics of instrumental leadership. Instrumental leadership is defined as: "the application of leader expert knowledge on monitoring the environment and of performance, and the implementation of strategic and tactical solutions" (Antonakis & House, 2014, p. 749). In this way, leaders provide resources and directions for the employees and do leaders monitor the performance and provide feedback based on their performance (Morgeson, DeRue, & Karam, 2010). Providing directions is closely related to sharing a clear vision, prioritizing the creation of a data-driven culture and showing persistence because all these concepts include that the leader should guide (direct) employees in the transition towards a data-driven culture. Instrumental leadership refers to the ability of a leader to achieve goals set by the company through analyzing the internal and external environment of the company, outlining strategic objectives and providing performance feedback (Chammas & da Costa Hernandez, 2019). Hence, in instrumental leadership it is important to provide performance feedback, chart strategic objectives and scan the internal and external environment (Antonakis & House, 2014). This matches with the initial codes about providing (individual) feedback. The use of data for the feedback is seen as important and interesting from the side of employees as long as it is not being used as a 'stick to hit with'. Unfortunately, in many situations the data is not yet used for feedback. In the data structure comes clearly to the forefront that it is important for employees that there is clearly priority given to the transition towards a data-driven culture. This leads to proposition two.

Proposition 2: The relationship between instrumental leadership and employee thriving is partially mediated by a data-driven culture.

Overall, leadership styles that facilitate employee thriving do not have to conflict with leadership styles that promote the development of a data-driven culture. In fact, when certain leadership characteristics are used correctly, they can actually reinforce the relationship with creating a data-driven culture and employee thriving. In short, there are two main leadership styles that have the potential to create employee thriving during, and with the help of the creation of a data-driven culture. These leadership styles are **transformational leadership** and **(potentially) instrumental leadership.** We developed propositions about which type of leadership styles could promote (the transition towards) a data-driven culture and employee

thriving. Next paragraph focuses on which elements of a data-driven culture promote employee thriving.

5.1.2 How a Data-Driven Culture Leads to Employee Thriving

There are several enablers that lead to a state in which an employee's thrive. One of these is enabling the decision-making discretion of employees. Although data, especially predictive data, can limit or even replace employee decision-making power, you do not see this as a concern among employees or managers. In contrast, it appears that the availability and understanding of data leads to **greater autonomy**. As people can back up their ideas with data. More autonomy is in the literature known as an enabler of employee thriving (Essop Mahomed & Rothmann, 2020). Spreitzer et al. (2005) talks about enabling decision making discretion as an enabler for employee thriving. More decision making discretion is a way of giving more autonomy to employees. The relationship with autonomy leading to motivation and engagement which in turn leads to more employee thriving is in line with the self-determination theory (SDT) of Deci and Ryan (2000). This theory of human motivation shows which basic psychological needs have to be fulfilled for employee work performance and well-being (Deci, Olafsen, & Ryan, 2017). The self-determination theory contains three basic psychological needs that are autonomy, relatedness and competence (Niemiec & Ryan, 2009). In short, a data-driven culture contains important elements that can be helpful to higher employees' motivation. Such as more autonomy, ensuring recognition and a faster learning curve. A data-driven culture has the potential to give more autonomy to employees since having more information helps in the decision making and justification of a decision. However, it is then very important to openly share the data with the employees. This makes it easier for them to make certain decisions because they are more defensible and they have a better understanding of the possible consequences. Unfortunately, what comes forward from the interviews is that the problem is often that directors-owners keep the data to themselves. This is also negatively associated with another important enabler of employee thriving, namely that of providing information about the organization and its strategy. Although employees are very interested in that data, it potentially can be beneficial for both the employee and the organization to share it more and be more open about it. In fact, it leads to irritation when employees know that the data is in the system but they do not have access to it. Hence, we add as a moderator variable the requirement that the collected and interpreted data should be shared openly with employees in order to experience greater autonomy.

Proposition 3 (P3): A data-driven culture leads to more autonomy for employees and managers when the data is openly shared with them, which will then enhance employee thriving.

A data-driven culture offers the opportunity to give an extra boost to employees' **learning curve**. Through data, they are able to gain more and quicker insight into performance, as well as quicker and better insight into where things are going wrong. Looking at the self-determination theory, competence is mentioned as an important psychological need for employee well-being and performance (Deci & Ryan, 2000). Competence is related to the degree to which someone feels able to meet the challenges related to the job (Niemiec & Ryan, 2009). A higher and faster learning curve has the potential to accelerate the feeling of being able to meet challenges related to the job. This could explain that a faster learning curve, because of the factors that are enabled by a data-driven culture (better and more insights in performance), is leading to employee thriving. Employee thriving is characterized by a joint sense of vitality and learning (Kleine, Rudolph, & Zacher, 2019; Spreitzer, Sutcliffe, Dutton, Sonenshein, & Grant, 2005). The learning aspect can be further exploited in a data-driven culture by using the data to seek for opportunities and get a better insight in performance. This information is crucial in the learning process. Dashboards give people a quick insight in several sources of data. For example, revenue, costs, failures, etc. But it can also give insights into your personal performance or team performance. This helps to create a quick view on what is going well and where someone or a team could improve. These insights could accelerate the learning curve of employees. Hence, data-driven technologies help employees to learn faster and show where room is for improvement.

Proposition 4 (P4): A data-driven culture accelerates the learning curve of employees by providing better and more insights in performance, leading to higher employee thriving.

Another enabler of employee thriving, which is more compromised by the use of data, is that of 'promote diversity'. When using data you search for the optimal solution. That is reflected in the example where a company gives training and afterwards lets participants fill in a survey. The training and the trainer are trying to be improved by the results of the survey. What you see is that every training becomes more similar and similar in order to get the maximum score on the survey. The 'diversity' in the training becomes less and this situation is also applicable in other cases. This is an example that illustrates the more **professional culture** that is mentioned in the framework (figure 2) where there is less room for innovativeness that can

occur when implementing a data-driven culture. It is well-known that employee thriving leads to innovation and innovative behavior (Wallace, Butts, Johnson, Stevens, & Smith, 2016; Riaz, Xu, & Hussain, 2018). If it also works vice-versa is not yet known. Based on the conducted interviews is the creation of a more professional environment a potential problem, when creating a data-driven culture. At least, it may be a problem because a more professional environment is, based on the interviews, likely to lead to less innovation. In a more professional environment is it less likely to just start with a "trial balloon". All ideas should be backed up with data. Less room for innovation is seen by the respondents as a negative trend. Resulting in less employee thriving. Besides that, a more professional environment could be related to a less personal environment and less interpersonal contact. From environments with less interpersonal contact it is known that there is less organizational commitment followed by high burnout (Leiter & Maslach, 1988). So, the opposite of employee thriving could happen due to the creation of a data-driven culture. This leads to the following proposition.

Proposition 5 (P5): A data-driven culture creates a more professional environment leading to less innovation, the unification of tasks and less interpersonal contact, which then has a negative effect on employee thriving.

Recognition is an important moderator of employee thriving (Moore, Bakker, & van Mierlo, 2022). Data gives insights into how a certain employee performs. The moment that data makes someone's performance clear and both the manager and the employee know that their performance is measured, it is even more important to show recognition for what someone is doing. A data-driven culture has all the facets to ensure recognition, as data can show the performance of employees. It is important for superiors to use this data in order to acknowledge their employees. In doing so they show, beside their appreciation, that the data is not only used as a 'stick to hit with'. As employees, in general, are quite well-informed about the data that is collected from them it is essential to make this data visible for their employees. The term 'visible' in this context means that concrete and hard figures on, for example revenue, speed of complaint processing, errors, etc., become clear and visualized in dashboards. The concept of making data visible and share it among colleagues is in line with the article of Spreitzer (2005) that states that broad information sharing (in this case: make performance data visible for employees) and relational resources (in this case: recognition from superiors towards employees) are vital for employee thriving. More specific is the paper of Guan and Frenkel (2021) where Leader-member exchange is mentioned as an important

enabler of employee thriving. Leader-member exchange refers to the leader-follower interchange within the workplace (Guan & Frenkel, 2021). Besides that, relatedness is one of the psychological needs of the self-determination theory leading to more engagement, higher performance and higher employee well-being (Niemiec & Ryan, 2009). You could argue that recognition from the supervisors is a form of showing respect to the employee and value the employee for the work that is done. This is why recognition, which is enabled due to the fact that for example performance data is visible, is an enabler of employee thriving. The employee receives recognition and this is positive for the relatedness of employees with their job. So, the managers must ensure recognition in order to maintain a good relationship with their employees. This leads to the following proposition.

Proposition 6 (P6): When a data-driven culture is implemented and both managers and employees know that their performance is clearly visible it is even more important to show recognition, which is expected to lead to employee thriving.

The above stated propositions are based on a combination of the extracted codes and the already existing literature. In Figure 2, the conceptual model is presented based on the propositions about leading the transition towards a data-driven culture from employee thriving. This paper adds to the literature two leadership styles that potentially have a positive effect on as well the transition towards a data-driven culture as employee thriving. Windt et al. (2019) emphasized in their article the importance and difficulty of leadership, but does not suggest leadership styles that potentially suit well to transformation towards a data-driven culture. Based on the literature discussed in section 2.4 was a transformational leadership style expected to have a positive relationship with employee thriving partially mediated by a data-driven culture. The instrumental leadership style came forward as a potential effective leadership style for the creation of a data-driven culture and for employee thriving mostly because of the importance of giving individualized feedback. Furthermore, this paper uses the self-determination theory of Deci and Ryan (2000) as an underlying explanation for why the factors that are enabled due to a data-driven culture could enhance or oppose employee thriving. The self-determination theory contains autonomy, relatedness and competence as psychological needs leading to higher performance and well-being. In our framework (figure 2) autonomy is related with the autonomy from proposition 3, relatedness is in line with recognition mentioned in our framework and competence is related with a faster learning curve which is enabled through a data-drive culture. Besides that, relatedness is also associated with the more professional

environment of the framework. In a more professional environment there is potentially less interpersonal and informal contact, which can have a negative effect on the relatedness of a person and on employee thriving.

All-in-all, it is clear that for the person responsible for implementing a data-driven culture, it is actually kind of walking a tightrope. A constant balance must be kept between using data to provide feedback, but not as a stick to beat with. On the one hand a manager needs to create vision and uniformity, which is what employees expect, on the other side of that spectrum, it is important that employees have a say in their own dashboard/data to increase adoption. The person responsible for the implementation has to show enthusiasm, but also has to make direct comments so that the data is viewed in a nuanced way with attention to the underlying story. It is also about keeping the balance between maintaining a culture of freedom and innovation on the one hand, and ensuring that data leads to a more business-like and corporate culture on the other, but not too much of a professional culture. It also remains a constant balancing act to keep the frontrunners close to you and enthusiastic, but not to forget the laggards. The conclusion that can be drawn is that both employees and employers are aware of the developments around data, want to be included in them and that the fear of data is not as great as expected. This study is one of the first to explore the relationship between two subjects that are growing in interest. On the one hand, the concept of a data-driven culture and, on the other, the concept of employee thriving. Both have been studied individually many times, but very little is known about the relationship (or no relationship) between the two. Besides that, this study further elaborates on the research agenda proposed in the article of Akter and Wamba (2016) where attention is drawn to the position of employees in the transition to a data-driven organization. This also aligns with the call from the article of Westerman (2016) to have an eye for the employees when implementing a data-driven way of working, otherwise it could have long-term implications for both the organization and the employees.

5.2 Practical Implications

Data-driven working is a popular term and is almost starting to become a container term. This paper provides clear guidelines related to the human side (employee thriving) when developing and implementing a data-driven culture. The single most important element in such an implementation and adoption is, of course, leadership. Through interviews with both managers who were affected by the desire from management to develop a data-driven culture and who also had to convince and enthuse their staff, a complete picture emerges of, among other things,

what challenges you are facing during the implementation of a data-driven culture. On one side you have the story of the people who have the intention to create a data-driven culture and on the other side you also have the view from people that are affected by the transition of a data-driven culture. A transformational leadership style and an instrumental leadership style are both types of leadership that contain elements that are positively associated with enablers of a data-driven culture and with enablers of employee thriving. These leadership styles are advisable at the time you start developing a data-driven culture with a focus on employee thriving

In addition, bringing in an outside party, beyond adding the knowledge, also ensures that there is a sense of urgency among employees. Bringing in an outside party shows that the change to a data-driven culture is serious and has priority on the strategic agenda of the organization. This sense of urgency contributes to faster implementation and adoption. The same applies for hiring new employees.

Furthermore, this paper clearly highlights the importance of creating and disseminating a clear vision of data-driven work. It also emerged that in order to develop a data-driven culture, it is important that this is supported by management, but that ultimately, for the practical implementation, it is vital to listen carefully to the wishes of the employees. Despite the fact that they do not have the direct knowledge of what data can do for them, they do know what information they are looking at and what information they are focusing on. Involving them increases the chances of a good implementation and adoption.

Another relevant practical contribution of this paper is that it shows that the transition towards a data-driven culture certainly does not have to get in the way of employee thriving, but can even reinforce employee thriving. Of course, when it is implemented in the right way and taking into account the correct facets for employees and the change.

Furthermore, this paper elaborates on the awareness of the importance of a leadership style when leading the change towards a data-driven culture for employee thriving. This fits with the trend that, besides the technology and knowledge side related to a data-driven culture, the human aspect is also crucial in this change. In conclusion, a leader in an organization that wants to create a data-driven culture while maintaining a thriving workforce should show persistence, share a clear vision and provide (individual) performance feedback. As the workforce is often well-informed about the possibilities of data, a leader should in the transition share the collected data openly and show that the data is always being put in the right context.

Next to that, it is vital to be aware of the potential threat of becoming too professional and too much focused on solely the data as an organization which in turn can harm the innovativeness and the thriving of the workforce. Instrumental leadership and transformational

leadership are leadership styles that contain elements that promote employee thriving while successfully implementing a data-driven culture. As a manager you should show exemplary behavior and explain why you are doing certain things to inspire the rest of the workforce to join the transition. This is in line with transformational leadership. To check as a manager if you are on the right track it is important to talk with the workforce to make sure that the workforce understands what you are doing and why you are doing things. Another very important aspect regarding the transition towards a data-driven culture, while maintaining a thriving workforce, is to give (individualized) feedback to the employees. In short, you should use the visualized data as a basis for giving feedback. Both, an instrumental leadership style and a transformational leadership style, are proposed to be effective in order to create a data-driven culture while maintaining a thriving workforce.

5.3 Limitations and Future Research

Like any other research, this paper has limitations which also provides opportunities for new research. The first limitation is that all companies in the sample were advised and guided by the same consultancy firm to become a data-driven organization. This ensures that all these companies have, to a greater or lesser extent, adopted the vision of a data-driven culture of the consultancy firm that helped them. This vision starts with a data-maturity scan, that is a 5x5 matrix to get insight in where the company is right now based on; culture, people, IT, process and data and on which level they are right now. This model is compiled from a combination of literature and experience. Although it is not radically different from existing literature, Organization A clearly disseminates their vision to analyze first; "where is this organization now based on culture, people, IT, process and data" and from there makes a plan what follow-up steps are needed to get to where the client wants to be. This is a limitation because, although it is not very likely, it is possible that when another consultancy firm is being contracted to help with the transition towards a data-driven culture different issues could arise.

A second limitation is related to anxiety issues of employees when a data-driven culture is being implemented. It is striking that in the interviews, there was a lot of talking about fear, fear that someone will feel monitored, fear that data will take over their work, fear that you will be judged on data without context being provided, etc. Despite the fact that people see and name these kinds of dangers of developing a data-driven culture, none of the respondents in the interviews revealed that they were actually bothered by fear themselves. It would take further research to see to what extent employees and managers actually have these kinds of fears. Potentially, a fully anonymous survey could reveal that respondents actually felt anxiety to a

certain extent during the transition towards a data-driven culture. However, based on the interviews, it can be said that these fears are not directly a major factor to be taken into account during implementation.

The third limitation is that the respondents were not chosen randomly. The organizations that were willing to participate in the study themselves nominated the employees and managers/directors who could be interviewed. This creates a possible sample selection bias if, for example, a company only nominates people who are already enthusiastic about a data-driven culture (Winship & Mare, 1992). The potential of pre-screening of participants by their supervisor, based on who is enthusiastic and who is not, is potentially harmful for this research. This is tried to overcome by asking the manager, who is closely involved in the cultural change, to come up with one manager and two employees for the interviews. This manager and two employees should be "affected" by the transition towards a data-driven culture. In this way, we also hoped to interview people who were a bit further away from the implementation, but were obviously affected by it. In doing so, we tried to paint a balanced image between big proponents of implementing data-driven culture and some employees who are more neutral or even not in favor of it. Clearly, this bias can be easily overcome by other research when selecting random respondents from an organization instead of letting a manager select the respondents for you.

The fourth limitation is related to the gender diversity in the set of participants. Most of the participants were male. It is potentially interesting to see whether there is a difference between males and females in relation to the creation of a data-driven culture and employee thriving.

A last limitation is that the participating companies were all in a different stage in the degree to which they have a data-driven culture. On the one hand that is a limitation, however it can also nicely show differences and similarities in different stages of the transition towards a data-driven culture. Some companies have been developing a data-driven culture for years, while others are still in the early stages. A culture change takes time and is not fulfilled in a day (Schein, 1990) and all of the respondents stepped in at different times in the organization. Some respondents were already in the organization before the decision was made to develop a data-driven culture, some at the beginning of the process and some further along in the process of developing a data-driven culture. On one hand, this provides the opportunity to paint a nice broad picture, but on the other hand, different challenges fit different moments in the process. We have tried to overcome this limitation by asking people who are further along in the transition to a data-driven culture to look back and those who are relatively at the beginning of the change to look ahead. This helped, but it does make it more difficult to generalize.

The first suggestion for future research is that future research could elaborate on this study by looking if there is a certain order in the codes when implementing a data-driven culture and striving for employee thriving. This paper focused on developing a framework around the implementation of a data-driven culture in the context of employee thriving, but had no focus on a certain order in the codes. Further research could develop a scheme focusing on a step-by-step process when developing a data-driven culture taking into account employee thriving and the aspect of leadership.

Secondly, this research main focus lies on the role of leadership in the transition towards a data-driven culture. Another main factor that influences the transition towards a data-driven culture, including the acceptance to use certain systems, is social influence (Venkatesh & Davis, 2000). This includes the social influence of co-workers. That is why it is interesting, for future research, to look at the role of co-workers in implementing a data-driven culture. Especially, in the context of employee thriving since co-workers have a significant influence on employee thriving (Moore, Bakker, & van Mierlo, 2022).

This qualitative research helps to create a framework about the transition to a data-driven culture in relation to employee thriving and the role of leadership in this context. Future research could use the insights given in this paper to, via a quantitative research design, test our propositions, research questions and hypothesis on the relationship between a data-driven culture and employee thriving. More longitudinal qualitative research could give more insights in the process over time when implementing a data-driven culture and the consequences for employee thriving. A process study of change could give insights about how managerial and organizational phenomena emerge, change and unfold over time (Langley, Smallman, Tsoukas, & Van de Ven, 2013). In the context of transition towards a data-driven culture, a process study could reveal which challenges are most relevant at which point in the process, but a process study with several organizations involved could also help to compare different organizations and look if they follow the same process with the same challenges when becoming a data-driven organization.

Lastly, another qualitative research could try to build a more chronological model of creating a data-driven culture and the challenges that occur. These kind of studies could be more specific about challenges and frustrations that occur during the transition towards a data-driven culture. For example, the often discussed subject in the interviews regarding anxiety could be well measured in a quantitative way, which would help answer the question whether several forms of fear are really an issue for people. More research about how a data-driven

culture could embrace employee thriving is very beneficial for both practitioners in the field of business as for academic literature.

5.4 Conclusion

The purpose of this study was to create a framework on how the creation of a data-driven culture influences employee thriving and what the role of leadership is in this matter. There was no real framework yet with regard to how these concepts could be related. That is why we chose a qualitative study with semi-structured interviews. We expected from several leadership styles that are known for their potential to facilitate employee thriving to also be beneficial for the transition towards a data-driven culture. Transformational leadership was already known for the potential to facilitate employee thriving, but could also be beneficial for the transition towards a data-driven culture. An instrumental leadership style emerged as a new driver of employee thriving in the literature, however based on the interviews there are elements of instrumental leadership that could enhance employee thriving during the transition towards a data-driven culture. It is clear that the concepts of employee thriving and the transition towards a data-driven culture do not have to interfere with each other. On the other hand, it is critical to be aware of the (potential) threats of creating a data-driven culture that could potentially harm employee thriving. For example, in a more professional environment, the anxiety of losing their job and the fear of being monitored based on the data without the right context. A lot of these potentially harmful threats can be overcome by being aware of said threats as a manager, involving the end-user, demonstrating exemplary behavior, explaining what you are doing and being transparent. In order to answer the research question, the emergence of a data-driven culture could contribute to employee thriving, provided that during the transition, a manager is aware of the issues that arise during such a transition and uses the opportunities that a data-driven culture offers, always keeping the employees in mind.

Furthermore, this paper adds to the literature with propositions about which leadership styles enhance employee thriving during the creation of a data-driven culture based on the conducted interviews. Besides that, this study provides more well-reasoned expectations about the threats and opportunities that arise during the transitions towards a data-driven culture in order to enhance employee thriving.

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Appendix A1 Interview Guide Manager

Draft interview guide Manager

Do you give permission that this interview will be audio-recorded? All the interviews will be safely recorded and will be deleted when the research is finished. Your anonymity is guaranteed, just like the confidentiality of this interview. Furthermore, could you skip any question and stop or pause the interview at any moment. You are allowed to refuse answering any question at any moment.

1. **Introduction**

1.1 (interviewer) Introducing myself and introducing the research topic.

1.2 Can you tell me about yourself (study, career, how long do you work here, what did you do before starting here **and function**)?

1.3 How do you like working in this organization?

2. **Data-Culture**

2.1 When did you start working data-driven?

2.2 Could you briefly describe the organizational culture before starting to work more data-driven.

2.3 Were you involved in making the decision to start creating a data-driven culture? (if not how did you feel about it?)

2.4 How did or do you feel about the creation of a data-driven culture ?

2.5 What was the reaction of your team/department about the decision to start working data-driven?

2.6 Could you describe what you consider to be a data-driven culture?

2.7 How would you rate the data-driven culture in this organization on a scale 1-10 and why?

2.8 What were the most helpful tips you got from consultants for implementing the data-driven culture?

2.9 Would you like to share some negative effects of working with data-driven?

2.10 Could you describe the biggest challenges in creating a data-driven culture?

2.11 How did you see your role in the implementation of data-driven culture?

2.12 What future challenges do you see about the creation of a data-driven culture in this organization?

3. Employee effects

3.1 What were the major effects of starting to work data-driven on the employees?

3.2 Did the change to a data-driven culture have an effect on the decision-making authority of the employees?

3.3 Are the practical changes due to the data-driven culture 'visible' and do share the results with your team/employees?

3.4 How often do you provide feedback to your team/employees? And to what extent do you use the data to provide feedback?

3.5 Do you feel checked by the data or do you feel you have more autonomy because of the data and because data could, potentially, endorse your ideas?

3.6 Could you also describe negative effects of the creation of a data-driven culture?

4. Leadership

4.1 How did you try to get the team on board for creating a data-driven culture?

4.2 How did you communicate about it?

4.3 Does the start of having a more data-driven culture influenced your daily work?

4.4 How has becoming more data-driven affected you in terms of how much you learn at work?

4.5 How influenced the more data-driven culture your energy level you have in your work?

4.6 What challenges did you or do you currently face in creating the data-driven culture?

4.7 How did you overcome these challenges?

4.8 How would you describe your leader's style?

4.9 Did your leadership style change since implementing the data-driven culture.

5. Closing

5.1 Is there anything you would like to share about the transformation to a data-driven culture I did not ask about yet?

Appendix A2 Interview Guide Employee

Draft interview guide Employee

At the start of the interview

Do you give permission that this interview will be audio-recorded? All the interviews will be safely recorded and will be deleted when the research is finished. Your anonymity is guaranteed, just like the confidentiality of this interview. Furthermore, could you skip any question and stop or pause the interview at any moment. You are allowed to refuse answering any question at any moment.

1. **Introduction**

1.1 (interviewer) Introducing myself and introducing the research topic.

1.2 Can you tell me about yourself (study, career, how long do you work here, what did you do before starting here **and function!**)

1.3 How do you like working in this organization

2. **Data-Culture**

2.1 Could you describe the culture in this organization?

2.2 Could you describe what you consider to be a data-driven culture?

2.3 How would you rate the data-driven the culture in this organization on a scale 1-10 and why?

2.4 What were, according to you, the most significant changes between the situation before starting the implementation of a data-driven culture and the current situation?

2.5 Would you like to share some negative effects of working data-driven?

2.6 Could you describe the biggest challenges in creating a data-driven culture?

2.7 How did you see your role in the implementation of data-driven culture?

2.8 What future challenges do you see?

3. **Leadership**

3.1 Were you involved in making the decision to start creating a data-driven culture? (if not how did you feel about it?)

3.2 How do you feel about the creation of a data-driven culture in general?

3.3 What was the reaction of you and your colleagues about the decision to start working data-driven?

3.4 How was the decision communicated to you?

3.5 What challenges did you or do you currently face in creating the data-driven culture?

3.6 How did you overcome these challenges?

3.7 How would you describe your manager's leadership style?

- How does he act in relation to your colleagues?

- What is typical for this manager?

4. Employee effects

4.1 What were the major effects of starting to work data-driven on you and your colleagues?

4.2 Did the change to a data-driven culture have an effect on your decision-making authority?

4.3 Are the effects of creating a data-driven culture shared with you?

4.4 How often do you receive feedback? And to what extent is data used when you receive feedback?

4.5 Do you feel checked by the data or do you also feel more autonomous due to the insights you have in the data and because it, potentially, endorses ideas you already have?

4.6 Does the start of having a more data-driven culture influenced your daily work?

4.7 How has becoming more data-driven affected you in terms of how much you learn at work?

4.8 How influenced the more data-driven culture your energy level you have in your work?

4.9 Are there also negative effects on working more data-driven?

5. Closing

5.1 Is there anything you would like to mention that I did not ask about yet?

Appendix C Exemplary quotes for the first-order themes

Exemplary quotes	Description	First-order themes
"I built a dashboard to keep track on how often dashboards are being used …. Call them when is see that a dashboard is not being used for quite a long time (E1-D)" "For your research, it might be something to include that I think there's a certain degree to how you can really internalize a data-driven culture in people. I think if you start letting go of the motivators of the data-driven culture, then the average employee will quickly let go of that as well I think. There's a certain amount of directiveness. A management or department has to say we're really going to try that, if you let go then the people will let go too. That is also a piece of perseverance (M1-D)." "My role is (as a manager / future director) to continuously drive the cultural change… (M1-C)" "The trick to such things is that you have to start something, but also finish it. This also requires a bit of perseverance. (M1-C)." "A manager or change leader indicates; "this is the future and this where we are going as an organization". You can stick your head in the sand, but that is pointless. (E1-C)" "Well inside they really do understand that this change is necessary. That it is really necessary. The awareness is there, but then you also have to ensure that you implement a different way of working. This requires perseverance (M2-B)."	Quotes that show that persistence is needed to make the change.	Persistence

"I was at a manufacturing company the other day where people had been working for 40 years. There the best thing is to just say; we're going to make a change. Take it or leave it. We start now and we are going to train together every Monday. (M3-A)." "So it has to be carried at the top and then also land with the rest of the staff and inspire the employees (M3-A)." "I think that (implement) does involve staying on top of things, especially at the beginning. It may be childish to do so, but it's up to managers to look critically at it in order to do so anyway. No offense, but it is often the same people who have difficulty with this (hours of administrative responsibility). (E1-A)."		
"A challenge in implementing a data-driven culture ... I think at all to bring attention to the importance of it. That starts with explaining what is data-driven work and what is 'Organization C's' vision of it? I think that's the first important thing. You want to get people on board and have them look at data-driven work in the same way. (E2-C)." "You have to explain to those people the advantages of data-driven work and that it is not used as a control tool, but that we want to make a planning together, for example. That if we know that we are doing so many things in the hour, we can make a schedule based on that. (E1-C)." "If you give them the goal. If you explain why you do things, people will go along with you, but you mustn't go too far (in demanding employees to fill in all sorts of sheets). At one point we had to fill out 80 sheets per ticket. Then people found it too much and stopped doing anything. M1-B)" "I think you have to explain very well why you do certain things. I was talking to the managing consultants this morning about result indicators. About what they are responsible for. We're talking, for example, about billability, cross-selling, management. These are all quantifiable	Quotes from participants regarding the need for explanation of the why and how when implementing a data-driven culture. In order to create more and faster acceptance and a better adoption and implementation.	Explanation

things, but if I want to know that in order to punish them, it's not going to work. If you explain why you're doing it and explain that ultimately those are the frameworks and the RIs to have the right conversations with each other, then it's going to work. (M2-A)." "It is then especially important that you start explaining to people why you want to analyze this and why you want this data. Whether that's for the finance department or because you want to make dashboards from it or so that we can do better sales planning internally. When the timesheet was explained to us, that was pretty clear. Especially the 'why' part is something you, as a management team, have to make very clear to your colleagues. Collect this and this is what we want to do with it. (E1-A)."		
"Look, as management you can think something is very important, but if you don't show the behaviour yourself, you're still nowhere. I think the management team has an exemplary role in this. So when we take a decision we also have to look at what data is available from that decision (M1-C)." "Ultimately if we are going to do it we need to manage it and we also need to start educating our coordinators that they are going to use the dashboards instead of their own excel. Management also has to start steering more based on data. They are still very much guided by data now because people inform them. But they must start working with their own dashboards (M2-C)." "Well, with meetings for example and from the sales team the question of how are we doing? We do an analytics update every month. Then we share how we did last month based on sales (M1-A)." "To make a certain way of working the standard it is important to set a good example …. An example is the 'Gemeente Amsterdam' (municipality of Amsterdam) . Everything has been neatly arranged, they have been well-trained and yet they go and print out all these Excel sheets themselves. Because entering the data for such a dashboard is not yet part of their standard procedure. So it's all about putting in all those elements, but you have to put in the data every	Quotes from respondents who endorse that example behaviour is important when implementing a data-driven culture in relation to strive for employee thriving.	Example behavior

moment. At meetings, at progress meetings. In all those things, I have to make it normal to use data. So that it becomes embedded in the standard procedure. (M3-A)." "… But we have to set a good example ourselves, practice what you preach, otherwise there is a very high risk of losses. We have some catching up to do. (M2-A)."		
"We have a very clear mission and a very clear vision. The goal that moves, but we do have very clear that we want to make our organization data-driven. We do this through persistence and enthusiasm and bringing people along and adding value (M1-D)." "So what is the biggest challenge? What the biggest challenge at the cultural level right now is still sticking to the vision that was established a few years ago. Companies are changing, especially now. The economy is slowly becoming a little more uncertain and managements are starting to shift from gosh where do we go and what do we allocate our budgets to. Economics always goes from boom to bust. And yet you always have to stick to: Gosh, what is your ultimate goal. What do you ultimately want to achieve with the data-driven culture? Because that takes years and years and years. If you don't keep investing in that then it sinks in. Like any human being; anything you give attention to will flourish and grow. If you let it go, in three years it will all have been for nothing (M1-D)." "You have the vision as an employer, so it doesn't have to come from the employees. You want to roll out that particular vision and then you have to get people on board. That starts with communication. (E2-C)." "Hardly any of that (creating a data-driven culture) is communicated. I think if you ask us; "what is data-driven work? What does that stand for? And what does that stand for within our organization?" I wouldn't know the answer (E2-C)."	Quotes from respondents about the importance of a clear and shared vision on a data-driven culture.	Sharing vision

"In fact, we have now been working with the IT vision to put data-driven work back on the map. We have sessions planned for that by now ... from the IT Vision develop a vision for a data-driven culture (M2-C)." "From my point of view, I think they are still developing that vision. I don't know about it yet; the MT has only expressed the desire to work in a more data-driven way. Although this is of course a very broad concept. So yes, you do notice that in consultations figures are used more and more often. I think we need to expand this further (E2-B)." "In most organizations where the change has really been made, a real chief data officer has been put in place (other employee). With Vision and this is what we are going to implement. Who indicates this is going to be our vision and this is what we are going to implement (M3-A)."		
"Also fear of if you guys can see this then the management can see it all too. So it all becomes transparent at once. One operating company thinks that is fine, if the director sees this or sees something strange he can ask the question and I will answer it. Other operating companies don't want that data to be so transparent at all ... Then it is important to show the benefits. Because yes, at the beginning it can lead to more questions, but eventually it should lead to fewer questions. So that's where you want to go, to give the director dashboards at a certain level so that he doesn't have to keep going to the controller, safety officer or something because he can see for himself what's going on. (E1-D)" "So starting with making sure our department was very clear where do we want to go and what is the goal. That way we had a common goal. And then constantly look for the connection with the organization. So don't want to go too fast and don't want to go too fast. So I immediately shared our ideas with the other managers. So that it became clear what we were doing to help them take the next step (M1-D)." "So the MT has an idea, but I think we should have the space to counter and come up with our own ideas (E2-B)."	Quotes from respondents about the importance of transpiration for creating a data-driven culture in relation to employee thriving.	Transparent

"Mainly getting the right information, so the technical aspect. The business aspect of this will very slowly move towards data-driven work. You then have to include in the team meetings what we are doing with data-driven work and why we are going to work data-driven. Then it will come to life automatically. If you force people to work with data ... look I am averse to hierarchy I am not a manager I am the leader. I only give a little guidance, the team has to do it. If you keep that team spirit in the culture and explain the why, but also discuss with them, gosh, what would you like to see and what do you find interesting. Then you get everyone on board (M2-B)."		
"Especially showing enthusiasm and added value. Pushing doesn't work. Take them with you and show them what is possible, then you often get them on board (M2-C)." "They are all included, people who have a little less affinity for dashboards will eventually go along on the enthusiasm of the ambassadors (M2-C)." "The people who I know are interesting and enthusiastic should be the first to try to get involved. If they are really enthusiastic, then they will also get the rest of the organization on board (E1-C)." "The enthusiasm of people, making the change from I don't want to go to gosh yes it does have added value. You do that by persevering and enthusing and sending the right people. You really have to take them by the hand through the process (M1-D)." "What we are focusing on now is enthusiasm. We have now started a data roadshow. We are going all over the Netherlands, visiting all 40 companies and then we are sitting around the table with all the directors, head project leader, head of procurement and financial controller. Then we show them the cool things we have built and what you can do with them. We have now visited 7 or 8 companies, and our focus is purely on enthusiasm (E1-D)."	Quotes from respondents about the importance of enthusiastic behaviour when implementing a data-driven culture in relation to employee thriving.	Enthusiastic

"It's a cliché but true. Every person in the organization has to be taken along and enthused and, above all, given that you should not be afraid of the transition to a data-driven culture but that they should see this as an opportunity (E1-A)."		
"On the other hand, I notice that it (the change to a data-driven culture) can also cause a certain cramp in employees themselves, like hey now I'm being monitored. Or now they see what I do. That in turn creates a bit of unrest and suspicion. Hey I do 10 and my colleague does 15 how am I looked at. Is the nuance being applied? So I do 10 difficult ones and my colleague does 15 easy ones. You do notice this unrest. Whether there is enough nuance within the interpretation of the data? (E2-C)." "Or what circumstances are at play here. I think that's very important as a manager. I can say based on the numbers you have to do 6 a week but you only do 2, but if I know that the person at home has a sick wife and grandma died. That can happen. I do have the data but then I have to take into account the circumstances (M1-C)." "... for example, with the telephone operator the context is very important. Of course, you don't have this directly with data. At the moment that you are constantly sent difficult tickets, then the person who picks up the easy tickets is automatically much faster than the other who constantly picks up the difficult tickets. If you then make a decision on that, I think that's wrong. So the context and content remains very important otherwise you make further choices (E2-B)." "The question of gosh there's a 9, but why is there a 9 and how did that 9 get there. If you don't provide that context, then data-driven is no fun at all, because then you only have flat numbers. You have to understand why there is a number somewhere (M2-B)."	Quotes from respondents that emphasize the importance of nuance and placing data in context for employees when implementing a data-driven culture.	Add nuance

"I do think that you see that the sales must ensure that the consultants have work, so in the initial phase you will have consultants who very much want to work, but there is no work for them. You have to be able to make that distinction (M1-A)." "No, that's why it's important to explain why you're doing it. It's an effort requirement, but it's about the story behind it. If we agree on someone's certification, then I need to know why it is that someone didn't make it. Maybe we made choices that someone had to focus on an internal project, but it's always a combination of factors where it could also just be that someone is very unlucky (M2-A)." "If you judge someone purely on the data, they will think: I can't do it right. Then you can talk about how you can do it right next time. So in principle the reasoning in data is good, but nuances must definitely be made (E1-A)."		
"So then as management you have to have a conversation with that man or woman, that if a computer can take over for you that doesn't mean that you've lost your job (M1-C)." "Job loss is a fear for many people. Perhaps this is also an issue for some, but for this it is therefore important that there is retraining and education for such people. You can see that coming from afar so you have to make sure that for those people there is another place in the organization that they can do well and like (E1-C)." ".... you shouldn't be afraid of the transition to a data-driven culture but that they should see it as an opportunity. The management has to be clear that there is no risk of losing the job or making people redundant (E1-A)." "On the one hand, people like it because it takes work out of their hands and they are relieved and it is error-prone and repetitive work. On the other hand, it can also create a sense of threat to their own jobs. I often work with people who are really positive about all the insights the data offers. They are less anxious about their jobs (E2-A)."	Quotes from respondents about job security when implementing a data-driven culture.	Job security

"Getting people on board is very important. The fear of control, in that you have to reassure people that they don't have to worry about that (E1-C)." "There's a lot of differences between companies. Some companies react out of fear, "Oh, how can you see so much? They are also afraid that if you can see this, the management can also see it. So it all becomes transparent at once. One operating company thinks this is fine, if the director sees this or sees something strange he can ask the question and I will answer it. Other operating companies don't want that data to be so transparent at all (E1-D)." "Some people started to answer to management. We have also had times when a dashboard was taken offline for that reason. For example, it said that a hired employee worked 3x as hoard as a permanent employee, but that had all kinds of reasons such as the hired employee had much easier cases and no consultations that permanent employees had. The manager might think something of that. At some point it normalized and then the fear became less (M2-C)."	Quotes from respondents about the sense and anxiety of being controlled.	Checked via data
"Having access to data makes me feel more autonomous. Suppose, at the time we hire a CRO marketer, as I am. Then we say the objective is, say, 10,000,000.00 annual growth. He agrees to that. Then I think it's very realistic to measure whether or not that's met (E2-B)." "You really have to have things substantiated now. The cowboys who did everything based on feeling, that's no longer possible. We now need to move much more towards a management style where data is leading the decision. The case of "yes I think" doesn't apply anymore. Cowboys have been working here lord very much from the beginning and they are really of go, go, go. For those guys, it's really a problem. They really feel like they're being held back now because now he has to figure things out first, then he has to come back to it. So they see this as very much slowing them down (M2-B)."	Quotes from respondents about the feeling of creativity and autonomy when implementing a data-driven culture.	Creativity and autonomy

"No it is rather the other way around (not feeling controlled by data). When I look at my colleague who does a lot of KPI driving, I see people coming up to her and saying, "Gee, what is my KPI and how come I'm doing more or less than the rest? For that it is precisely a motivator (E1-C)." "On the contrary, the data, like the KPIs, should serve as motivation. It can be confrontational, of course, but that makes it very clear whether someone is performing well or not (M1-B)." "We are now only sharing turnover figures with colleagues, while you actually want to know how am I doing? So the employees themselves also want to have a lot more information about themselves. You notice that employees like to know how they are doing (M3-A)." "Look ultimately you also want to show what you are doing and I think it is important that they as owners are also included in the things we are working on. And beyond that it's also deeper, because you want to have appreciation for what you do and that you are taken seriously (M2-A)."	Quotes from respondents illustrating the need of recognition and the help that data provides in recognition.	Recognition
"We're looking at...another example, in the past an appraiser used to take 1.5 hours on an objection. The other day, they suddenly charged for 2 hours per objection. Then the question arises as to how is that possible? That's certainly something we look into. That's not to be confrontational, but it is to understand, gosh, what happens then (M1-C)." "At this point, that (feedback based on data) has not been addressed, but what we want to move towards. That also comes back to the vision. We do want to look at how the process relates to each employee. If you then have a bottleneck in the process somewhere because of an employee sitting on top of that, then that employee is probably not quite in the right place. Then there is also the question of whether that employee wants to be there at all. That has everything to do with culture. It's a link, you know (M2-C)." "Using data has made it completely different. Before, we didn't give feedback at all and not at all based on data. Because things were not open and transparent either. For example, if we as IT did a project for a business unit, we were not open about it. The business just had to wait when it was	Quotes from respondents about receiving or giving individualized feedback based on data.	Individual feedback

finished. Now we constantly communicate where we are. So they know what it will cost, where we are now and when it will be finished. It's a totally different way of feedback and between the business and IT working together (M1-D)."

"No (receiving feedback using data) actually not in that way, but that would be nice. What we do with the implementation team is that we often have departmental sessions, then you often get to tell something (E1-D)."

"No actually I don't. I would love to, but I don't really get it at the moment. We should actually just be tested against the business plan that was made. Compared to your business plan, you are now doing it this way or that, these are things that just have to be tested. Your business plan was once approved, it contains all kinds of targets, but we're not really talking about that at all. We are now half a million euros behind in terms of turnover, but you don't hear about that. It could also be that we are now making a much higher margin (M1-A)."

"Turnover technically only (feedback on the data). At the very beginning we also got the initial cost. That turned out not to be correct in the end, but we could then see somewhat per job scale what amount it costs. We know approximately the return on hourly billing. A training course goes about times 3 and a consultant times 2. About..... Yes it is really ridiculous. Really ridiculous, but well there is plenty of money being made, so no one really cares (M3-A)."

"This year, for the first time, we have prepared a business plan with a financial budget. We are going to discuss this for the first time in mid-June. Then we will have a kind of quarterly review. It's not that the initiative for that comes from the management, but it comes from us (M2-A)."

"Now it's all subjective and no data is used yet in individual feedback. I look at how someone does his or her job, what I notice and then I give 1-on-1 feedback on that. Then I go with a consultant to a customer and then I evaluate what I thought was good and what could perhaps be better, but I don't record that (E2-A)."

"Based on a standard questionnaire and we were allowed to set that up from the data department. It is open to everyone, so the buyer from company X can also see how company Y has assessed the supplier. This is actually the first time you see them actually thinking, "Oh, data helps me." With this dashboard, they can really learn from each other (E1-D)." "For example, if you look on sales you can see how much discount is given on average. How is it possible that there is a difference and how can you learn from each other in that sense. So that you contribute more to the business result in the end (M1-A)."	Quotes by respondents that illustrate the possibility for learning based on a data-driven culture in relation to employee thriving.	Learning curve
"People interact with each other quite informally here. I think that at some points it could or should be more professional... You set KPIs, you draw up schedules and that you, I think, steer hard on. Then you can be very informal with each other, but a deal is a deal (M1-C)." "In doing so (through a data-driven culture) get away from that 'beer mat metality' (making vague decisions and agreements), so, for example, just specifically asking how did we purchase what and for how much (E1-D)." "The culture was very much; 'everyone just does things their own way'. Furthermore, there was a very clear dividing line between the business and the IT ... The tilt that has been made in this and that we wanted to make is that IT has really become a partner of the business in all kinds of areas (M1-D)." "At the beginning what it more freestyling and a little more of a playground. Then it was a lot driven from gut feeling. Now you have to actually be able to prove with data that something is so (E2-B)." "I think everyone gains a bit of maturity with that, so they know what is my contribution to the company. Then you can compare yourself with how others do. If you look at sales for example, you can see how much discount is given on average. How is it possible that there is a difference	Quotes by respondents that focus on the shift to a more professional/corporate culture when implementing a data-driven culture.	Professional/ corporate culture

and how can you learn from each other in that sense. So that you contribute more to the business result in the end (M1-A)." "... family-like culture where you were allowed to do hobby projects and there was no management of returns and that went to a corporate culture where you also had to justify your hours (M3-A)."		
"I think with a data-driven culture you have to be careful not to kill a piece of entrepreneurship in people. A piece of free enterprise has to remain and not everything has to follow exactly how the computer says it should (M1-D)." "In addition, you can also focus too much on numbers which puts pressure on an employee's creativity, while this is very important (E2-B)." "The only thing you can do and KPN went too far in that. That is to let you get bogged down in data. Then you really lost your gut feeling. The same goes for data as for processes. You have to seal off 80% and have 20% leeway. I think it's exactly the same with data. Data is an outcome from the past. If you want to go to the future, it may well be that there is a slightly different story. You mustn't let yourself be totally driven by data. The feeling, the entrepreneurial, the cowboy style, must always remain in there otherwise you will be flattened (M2-B)." "... That (danger of a data-driven culture) people stop thinking for themselves. After all, data is still created by ourselves as humans (M3-A)."	Quotes by respondents about the chance of losing innovativeness when implementing a data-driven culture and the relation with employee thriving.	Losing innovativeness

"Now we are entering a certain management phase and we have to bring structure and establish the organization. That does mean that you also have to start looking at a completely different type of person. We don't just need cowboys. For the culture we still need cowboys, but you have to make sure you have a good mix (M2-B)." "We started bringing in other people at some point. People with more experience in larger organizations as well. Data is also more of an issue for these people. If we have problems, they start to reason from the data (M1-B)."	Quotes from respondents that stress the need for new employees in order to implement a data-driven culture.	Hire new employees
"... When an outside company does the implementation initially, it feels more serious and professional for the employees as well (M2-C)."	A quote from a respondent that acknowledge the added value of external parties when implementing a data-driven culture in relation to employee thriving.	Hire an external party
"Then it is said we see the added value , but we do not have the time now to do something with it. You get a lot of that back. They caught it being important, but not urgent (E1-D)." "We started it (developing data-driven culture) ourselves, but at some point you are so busy with it that we decided to bring in an external organization. To keep more focus on our own organization, we decided to bring in an external organization. That way we have more time to be busy with the things we need to be busy with (M1-B)."	Quotes from respondents about prioritizing the implementation of a data-driven culture.	Prioritizing

"I express it (the desire for a data-driven culture) every time, but we don't have access to that data so we (management team) get stuck in that sense. I also don't know if it's a priority with management (M1-A)." "So those (director-owners) know that there is a need, but we are also looking at technical feasibility, time has to be put into it. In terms of finances it is also known, but I don't know what the current priority of that is at the moment (E2-A)."		
"... yes, right (sharing successes through data-driven work). We are working on a project right now ... the results I share correctly, because I don't consider that the repetitive work doesn't have to be done by an appraiser ... they figure that out on the shop floor themselves (M1-C)." "Furthermore, we now have GB Top sessions, which are process optimization processes in which we take random or selected parts of a process and optimize them. We take different employees with us and take an integrated approach. We then look at how it can be done more efficiently and optimally. From there things are automated and rearranged. This is thought up together by the employees themselves. In this way the whole process is sealed. This has been going on for a long time now. That is seen as very nice, because yes we have improved the process together again (M2-C)." "We have a success board, in it we share successes internally. In addition, we also share successes during the roadshow if they are achieved (E1-D)." "Because it went well (successful implementation of a data-driven culture) it spreads like an oil slick throughout the organization (M1-D)." "We do that (share successes) at least at the monthly meeting. Like 'zakelijk plus' was a plan for this year. That is running super now then it is nice to share something like that. We can get that directly from the dashboard now (M1-B)."	Quotes by respondents showing the importance of celebrating small successes to implement and adopt the data-driven culture and the relation with employee thriving.	Celebrate small successes

"Implementing a data-driven culture should be supported by my supervisor and facilitated by the management team, but the question of what data do I need to optimize my processes. That question must be answered on the shop floor (E2-C)." "There are always some (employees) who are very eager and they just want more, but what we have seen now with the first pilots is that employees say; 'I would like to see this, this and this too.'(M2-C)" "If you really want to implement something (a data-driven culture) and really have data-driven work as a culture, then you have to put it in the week first and have a test period and you have to get the right people involved. The people who I know are interested in this and are enthusiastic about it you have to try to get them on board first (E1-C)." "We were out again within half an hour. Then it was said what should we do with this junk ... What we encountered was that we thought that the dashboards created at corporate level were also directly applicable at operating company level (end-user) (E1-D)." "Then we said we need to get those people (end-user) more involved, so we don't decide for the business what to build, but they decide what to build and we are then the important link to make it (E1-D)."	Quotes by respondents illustrating the importance to involve end-users in the creation of a data-driven culture in relation to employee thriving.	Involving the end-user