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1. Introduction – Shortage of skilled IT-professionals

Digitalization has been a hot topic in the political discourse of Germany and the industrial realm for well over two decades. Yet only in recent years it has become clear how broad its impact actually is, as consumers adopt technological innovations quickly and get accustomed to the facilitations and benefits they bring to everyday-life (Ternès et al. 2015). Digitalization has become omnipresent. Not only the tech sector, but all industries are affected by information technology as they are adapting to new customer needs. The digital revolution has changed the business model and strategy of whole formerly non-technological industries (Federal Ministry for Economic Affairs and Energy 2019a). The term “Industry 4.0”, symbolizing the newest phase of industrial revolution, has become a catchphrase in the discourse about digital transformation. It is also the name of an initiative by the German government introduced in 2012. A research platform by the same name works to promote the intersection between modern technology and industrial production and the development of autonomous machinery, artificial intelligence and the internet of things (IoT). The expressed goal is to optimize value chain processes not only in production but also in mobility, healthcare and energy. The German government hopes to put German industry on the forefront of the fourth industrial revolution and thereby become a competitive manufacturing location and an attractive trading partner (Federal Ministry for Economic Affairs and Energy 2019b). Nevertheless, the development of artificial intelligence, IoT and data products, the utilization and analytics of big data as well as data security represent challenges that ironically can only be tackled by humans. People, specifically those who are highly skilled in information technology, are more in demand than ever before.

With information technology penetrating most areas of work and life, the above average increase of jobs for IT professionals in recent years is easily explained. The most recent report of the German Federal Employment Agency showed that demand for skilled IT-professionals reached peak level with 20,000 registered open job offers in 2019, while the unemployment rate dropped to 2.7 percent from 8 percent in the previous year (Statistik der Bundesagentur für Arbeit 2019). At the same time employers face bottlenecks when trying to fill vacancies for experienced IT personnel in software development and application consulting. The digital age provides IT professionals in Germany with work opportunities in many different areas as well as a wide-ranging field of tasks. More than 40 percent of the 802,000 IT employees liable to social insurance work in firms whose business focus lies with providing IT services. Others are

employed in the IT departments of companies across all industries, notably the business administration and consulting sector (8 percent), the public sector, in manufacturing of electronic products, the insurance sector as well as the automotive branch with 3 percent each. Due to high demand Germany is an attractive location for IT personnel. Around 10 percent of the IT workforce liable to social insurance have a foreign nationality with tendencies increasing (Statistik der Bundesagentur für Arbeit 2019).

IT professionals today find themselves in a favourable position when looking for a job. But how does the shortage of skilled IT-people affect employers? The German Federal Association for Information Economy, Telecommunication and New Media Bitkom interviewed 855 HR managers with 82 percent stating a current shortage of IT experts and 59 percent expecting the situation to exacerbate in the future. In addition, recruiting proves to be rather difficult: a third of the surveyed report that it takes longer to occupy an IT position compared to other professions. Three in four companies also complain that salary expectations of IT professionals are too high, which is a further sign for the fierce competition that employers find themselves in when trying to attract IT personnel. The labour-market for IT professionals in Germany can be characterized as an employee market. An IT specialist usually can choose their preferred employer, which results in a disadvantage for medium sized and public companies who are often not able to meet their steep salary expectations (Bitkom 2018b).

However, attracting skilled IT personnel is only the first challenge employers in need of technology experts are facing. Additionally, it is getting increasingly hard to retain IT-professionals, as shown in last year's global study by the career platform LinkedIn (2018). The study revealed that the tech sector has the highest turnover rate with 13.2 percent leaving their job in 2017. The gaming (15.5 percent), internet (14.9 percent), and software industries (13.3 percent) had the highest turnover rates in tech. Numbers get even higher when looking at specific occupations: user experience designers had an extremely high turnover at 23.3 percent, data analysts and embedded software engineers are at 21.7 percent. Their specializations are in immense demand. Strong evidence suggests that the factors which are making retaining tech talent so difficult are high demand and rising compensation within the industry: as employers and offers get more competitive, top talent is more eager to take on new opportunities (LinkedIn 2018). This theory is also supported by the LinkedIn data showing that almost half of departing tech employees take another job within the tech sector (LinkedIn 2018). A survey of 200 German CIOs reached similar conclusions: 44 percent of CIOs saw rising and more diverse job opportunities in the IT labour market as the top reason for voluntary employee turnover.

Insufficient salaries, little development possibilities within the company and bad work-life-balance were deemed further causes of the high employee fluctuation in the IT sector by 27 percent of respondents, respectively (Robert Half 2018).

Shortage of skilled IT employees is a struggle for many companies. Employers experience tight competition in the information technology labour market, which clearly favours employees. Knowing what IT professionals are looking for in an employer and taking appropriate measures can be a significant competitive advantage for an employing firm. Employer rating platforms such as the Austrian website Kununu, where employees can evaluate their employing company anonymously, are a valuable source of information on employee satisfaction. Such websites are generally geared towards jobseekers trying to get “insider”-information about a potential new employer; they are also used by companies as an employer branding tool.

While employer evaluations on Kununu are compiled by company to generate an overall company-rating, the information value of the data contained in each evaluation is much broader. By focussing on evaluations from IT professionals working in IT firms and non-IT firms across all industries in Germany, this thesis aims to analyse data generated by employer rating platforms from a new angle and thus contribute to a field of academic research that has previously been neglected. Although Kununu is active in Germany, Switzerland, Austria and the United States, about 65 percent of reviews come from employees in Germany (Kununu Pressefragen accessed 01/2020). As this thesis uses a quantitative approach, data was drawn from Kununu’s key market, which is why this study is limited to German IT employees. The goal of the study is firstly to determine how satisfied IT-employees are with their employers and to single out the factors which are more and less influential on job satisfaction. A comparison of the two groups – IT personnel in IT firms and in non-IT firms – may reveal differences in the levels of satisfaction and therefore allow conclusions as to where and how employers could improve their offers towards IT professionals.

The thesis is structured as follows: the second chapter will start by explaining what IT professionals do and how they are positioned in the German labour market. It will then lay out research on IT professionals’ personality traits as well as the IT occupational and organizational culture. A brief outline of the person-organization-fit theory serves as basis for unifying the findings on personality traits of IT professionals and cultural dimensions in the IT profession and organizations. The database of the empirical part of this thesis is gathered from a platform inquiring peoples’ satisfaction with their employer. Therefore, the third chapter will provide a general overview on the extensive research body on employee satisfaction as well as a short

review of academic papers focussing on IT employees' satisfaction. Chapter 4 is dedicated to the formulation of hypotheses concerning IT professionals' job satisfaction in IT and non-IT companies. Chapter 5 will first explore the concept of crowdsourced rating platforms and employer rating platforms, specifically. Their relatively newly found use in academic research as a provider of valuable data and information will be addressed by giving a summary of the current state of research. The history, business model and layout of the employer rating platform Kununu, where the data for the present study was taken from, will be outlined before ending the chapter with criticism concerning the reliability of online employer reviews. The sixth chapter describes how the data for this study was collected and assembled. 1155 reviews from IT professionals working in IT and non-IT companies, which score both above and below the Kununu average, are analysed by tests of comparison as well as multiple linear regression. The results will be discussed along with findings from previous research in chapter 8. The limitations of the study and a final summary of results will conclude the thesis.

2. IT professionals

2.1. Defining IT professionals

Due to the current shortage of skilled IT people in Germany combined with heavy demand across all industries the IT occupational group draws the attention of HR managers and academics equally. Who are IT people? What are their vocational paths? Do they differ from other occupational groups and if yes, how so? What do IT professionals expect from an employer? How can a company attract and retain IT talent? These questions have been extensively covered in thousands of online articles and books by HR advisors (Rechsteiner 2016; Queb e.V. 2017; Rechsteiner 2017; Gwosdz 2019) as well as in academic papers. The following chapter will firstly give an overview of the German IT workforce and secondly provide insight into the current academic research concerning IT professionals.

IT professionals are defined as people who work within the IT department of an organization, work as freelance IT consultants or otherwise fulfil a function in information technology by providing hardware, software and technology services (Jacks and Palvia 2014). As technological advancement plays a more and more essential role in businesses of all kinds, the scope and variety of tasks IT professionals take on are growing as well (Jacks and Palvia 2014; Shih et al. 2011). An IT job glossary by personnel service provider Robert Half shows how diverse the IT profession is nowadays, listing over one hundred different IT job titles and

corresponding task fields (Robert Half 2019). According to last year's report of the Federal Employment Agency, almost a third of the 802,000 IT specialists employed in Germany design, support and develop hard- and software solutions and complex IT systems. 28 percent place their main job focus on software development and programming, whereas 22 percent work in application consulting, system analysis and sales of IT products. One in five IT professionals are database developers, network technicians or system and web administrators. Around 3 percent of IT employees exclusively fulfil management positions (Statistik der Bundesagentur für Arbeit 2019).

Many vocational paths lead to becoming an IT specialist in Germany. In 2018 the country recorded an employment growth in IT of 6 percent compared to the previous year, of which the largest part was accounted for by IT people with a higher technical college degree or university diploma in applied and general computer sciences or business informatics. 47 percent of employed IT workers in 2018 were academics. Other typical formations include apprenticeships as IT specialists or computer technicians (Statistik der Bundesagentur für Arbeit 2019).

The quota of women in IT occupations is traditionally small. With only 16 percent in 2018 the proportion of women in IT is still very low compared to the 46 percent of female workers in the overall workforce. Taking into account the current female share of IT people in training, no major changes are to be expected in the foreseeable future. Only among undergraduates in IT studies a slight increase of female students can be noticed – at 21 percent in 2018 they account for one percent more than in the previous year (Statistik der Bundesagentur für Arbeit 2019).

It should also be noted that statistically IT professionals present a rather young occupational group with 9 out of 10 IT professionals in Germany being under the age of 55, whereas it is 8 out of 10 in other professional groups on average. This means that the demand of new personnel in replacement of retiring employees is lower than in other professions (Statistik der Bundesagentur für Arbeit 2019).

Considering merely the employment statistics in Germany, several differences can be noted between the IT workforce and other occupational groups regarding unemployment rates, age- and gender-distribution. But how different are IT people from other professionals? Is there such a thing as a typical personality type for IT professionals? Do they have different values and needs when it comes to their employment? Answering these questions could be useful for a variety of purposes such as the development of recruitment and retention strategies specific to IT professionals. These could involve the identification of training needs, development of career

planning programs as well as improvements in placement coordination, counselling and ongoing management. From the employer's perspective the consideration of IT workers' specific personality traits and the IT occupational culture can help improve person-organization-fit and subsequently reduce job dissatisfaction and turnover as well as contribute to increasing productivity.

Lounsbury et al. (2014) conducted a study with 85,835 participants to examine if IT professionals present distinct personality traits that differentiate them from other occupational groups. The results were indicative of multiple differences in the expression of the Big Five personality traits (openness, conscientiousness, extraversion, agreeableness, emotional stability) and narrow traits (customer service orientation, work drive, assertiveness, optimism, tough-mindedness) between IT and non-IT professionals. IT people scored significantly higher in tough mindedness. This result can be expected as many job duties and tasks in information technology require rational analysis, logical thinking, problem-solving skills and objectivity which in turn calls for employees who are able to remain detached, analytical and tough minded. IT workers also scored higher in agreeableness which seems surprising in view of the prevalent conception of IT workers valuing their autonomy and independence in the fulfilment of tasks (Lounsbury et al. 2014). On the other hand, there are multiple examples of programmers sharing their tools and working together on projects to achieve a common goal. Moreover, especially in non-IT firms, IT staff is required to work closely with members across all departments rolling out technology-based projects. Skills like teamwork and communication are becoming increasingly important in the work routine and are therefore included more and more in professional training. IT work requires dispositions suited to both independent tasks and interdependent work that requires teamwork, one being more important than the other depending on the nature of the job, task and organization (Lounsbury et al. 2014).

Additionally, IT professionals showed a comparatively weaker expression in the seven other personality traits tested such as conscientiousness, assertiveness, extraversion, work drive, customer service orientation, and optimism. The author found these results to be mostly logically consistent and easily explained looking at the nature of IT work. Furthermore, the findings appear consistent with the notion of IT people fitting the requirement of fulfilling a mix of independent and interdependent tasks (Lounsbury et al. 2014).

The research conducted for this thesis does not offer any further conclusions as to how IT professionals differ from other occupations, since a comparison of how employer evaluations

by IT professionals differ from evaluations by other occupational groups was not part of the design. Nevertheless, it is still important to include the findings of Lounsbury et al. (2014) at this point as they provide valuable insight into why singling out this professional group might yield useful results for HR management and strategies.

2.2. Occupational and organizational culture in IT

Jacks and Palvia (2014), Jacks et al. (2018) as well as Schmiedel et al. (2016) have recently conducted research into IT occupational culture and identification of cultural factors – a field that has otherwise received little academic attention (Leidner and Kayworth 2006).

Culture can be defined as a set of cognitions shared by members of a social unit. These cognitions include fundamental assumptions, values, norms and patterns of behaviour (Bloor and Dawson 1994; O'Reilly et al. 1991). As many researchers have dealt with the topic of culture in the past decades, a wide variety of definitions of “culture” could be listed here, as well as a number of different attributes that bind a cultural group. However, the commonality between all cultural frameworks seems to be the notion of shared values within a cultural group (Jacks and Palvia 2014). Basic values can be defined as internalized normative beliefs that can guide behaviour. The values shared by members of a social unit form the basis for social expectations or norms (O'Reilly et al. 1991).

Many different social units with distinct cultures exist alongside each other but also within each other. Researchers of the past three decades have focused on mainly two levels of culture: national and organizational (see f.e. Hofstede 1998; Schein 2010). Every individual is a member of multiple social units: a German IT professional working for a car-manufacturing company in Munich is simultaneously influenced by their national culture, their ethnic culture, the organizational culture of the company and their occupational culture. Due to these overlaps, deciphering the values, norms and behaviours that are distinct to the specific group poses a major research issue. Schein (2010) argues that if culture arises from a common educational background and joint learning, leading to similar ideologies, speech and behaviours, many occupations can evolve cultures. The formation of a culture depends on how strong socialization is during the education period and if the beliefs and values learned during this time remain stable outside of the social unit. Schein claims that members of an occupational group are trained similarly everywhere to achieve the same skill set and values, which is why occupational culture persists globally. However, macro-cultures such as the national culture still influence how occupations are defined in a particular country (Schein 2010).

Subsequently, IT occupational culture can be defined as the values, norms and symbols of those who work in the occupation of information technology. The investigation of IT culture and the identification of cultural dimensions is important as it has concrete implications for workplace and job performance (similar to the influence of IT professionals' personality traits on work environment and job success). Firstly, the analysis of IT culture may explain shared meanings and expected behaviours for IT professionals. Secondly, the acknowledgement and understanding of IT occupational culture may help prevent cultural conflicts. Conflicts can arise when two or more occupational groups that do not share a set of core values interact with each other. Awareness of a potential cultural friction may for example facilitate communication between the IT department and business managers. Thirdly, IT occupational culture may impact business success positively or negatively, depending on how well the occupational culture meshes with the organizational culture (Jacks and Palvia 2014). In their study, Jacks and Palvia identified six core elements of IT occupational culture: structure of power, control, open communication, risk, reverence of knowledge and enjoyment. According to their findings these six dimensions do in fact reflect what is common to the IT occupational culture, as they were stable among the participants surveyed, indicating no influence of differing organizational cultures. In a later study Jacks et al. (2018) refined and conceptualized the results of the first study. Based on qualitative interviews with IT professionals and survey data the following conclusion was reached: *"IT is an occupation that expects a high level of personal autonomy, is intolerant of any ambiguity in both communication and work structure, craves the opportunity to create and innovate, respects intelligence over authority, and strongly desires enjoyable elements of play in the work environment."* (Jacks et al. 2018, p. 108). Nevertheless, it is important to note that the homogeneity of the IT occupational culture should not be overstated as there are certainly differences between members, for example based on their tasks or personality.

Schmiedel et al. (2016) used a method similar to the approach in this thesis as employer reviews from the American platform Glassdoor were evaluated in order to identify IT cultural factors through automated content analysis. Unlike the previous research examples this study does not focus on the occupational culture within the IT profession but rather on factors of the organizational culture that are relevant in IT companies. To identify these factors, they analysed the textual parts of 112,610 reviews (from both IT and non-IT professionals) on Glassdoor relating to about 40 IT companies. As a result of their findings the authors conclude that a culture of fast pace and hard work has a strong positive influence on employee satisfaction in the IT sector. Challenging work tasks and an environment of continuous learning are important

factors contributing to employer satisfaction in the IT industry and are more strongly appreciated than performance appraisals or benefits. On the other hand, incompetent management or a gap between senior management and the operational level as well as discrimination of women in the IT sector are among the factors with the strongest negative influence on employee satisfaction (Schmiedel et al. 2016).

2.3. Person-organization-fit in the IT sector

Lounsbury et al. (2014) study of IT people's distinct personality traits and Jacks et al. (2018) research of IT professional culture lead to the conclusion that IT professionals have certain values, personality traits and expectations towards their employment in common. Schmiedel et al. (2016) on the other hand identified culture factors in IT firms and their influence on employer satisfaction. As the former studies examined culture on an occupational level, the latter looked into the organizational level of IT culture. When taking into account the findings of both the occupational and the organizational level of IT culture, a question arises: If the cultural factors identified on both levels match up, could that positively influence an IT professional's job satisfaction in an IT company?

The topic of person-organization-fit (P-O-fit) has been widely discussed since the 1980s by academics in the field of organizational behaviour and psychology. The concept of P-O-fit was formally defined by Kristof (1996) as the compatibility between individuals and organizations. The author distinguishes two perspectives of compatibility between persons and organizations: "Supplementary fit" refers to the conformity of a person's characteristics with the other members' of an organization. The person therefore has characteristics similar to the other members' characteristics. The "complementary fit" however describes the mutual complementarity of individual and organizational characteristics. This means for example that a person's characteristics can add to what an organization is missing and vice versa. In other words, a supply on one side meets a demand on the other (Kristof 1996).

Schneider (1987) developed a related framework – the attraction-selection-attrition model (ASA model) – based on the idea that people influence their work environment's characteristics through their own personality. This means that the organizational culture is formed by the values, attitudes, beliefs and behaviours shared by the organization's members. According to Schneider, founders and top management have an especially strong influence on the organizational culture, as they determine the organizational goals, processes and structure. The organizational culture consequently conveys to members and prospective members what is

expected and promoted in the organization. Therefore, an organizational culture may change with the recruitment of employees who display different characteristics than the present members. According to the ASA theory, individuals are attracted to organizations they perceive as having values similar to their own (attraction). On the other hand, organizations choose employees who possess the desired characteristics (selection). Employees who do not fit in with the organization will eventually leave (attrition), which leads to increased homogeneity within the organisation (Schneider 1987; Schneider et al. 1995).

Empirical results have typically confirmed that the congruence of individuals' personalities and the demands of the jobs are associated with positive affect (Cable and Judge 1996; O'Reilly et al. 1991; Edwards and Cable 2009). High value congruence is an important factor of P-O-fit: the fit of peoples' values with values of the organization they join, can predict individual satisfaction, commitment, turnover and performance (O'Reilly et al. 1991; Kristof 1996).

When comparing the results of the studies on IT professional culture with the findings on the IT organizational culture, there seems to be an overlap in cultural factors and the values found relevant. IT professionals are predominantly more introverted (Lounsbury et al. 2014), which matches with the greater need for personal autonomy (Jacks et al. 2018). The desire for opportunities to create and innovate fit the findings of Schmiedel et al. (2016) in that a challenging work environment and fast pace culture increase employee satisfaction in the IT industry. Jacks et al. (2018) stated that IT professionals seem to respect intelligence over authority, which corresponds with the notion of incompetent management and a gap between senior management and the operating level having a strong negative influence on employee satisfaction (Schmiedel et al. 2016). The factors identified in the studies of IT occupational culture and the organizational culture in IT firms coincide for the most part, which is not surprising given the fact that most of the employers in IT firms are IT professionals. An organization's culture is formed by the people in it (Schneider 1987). Since IT professionals make up a large part of the workforce in IT companies, their occupational sub-culture might become dominant in the company's culture.

Drawing on underlying values, individuals manage their lives in ways that help them choose suitable roles, occupations, and even organizations (O'Reilly et al. 1991). A person may choose an IT career because it matches their interests and personality traits. Those characteristics may be reinforced through the vocational education and the connection with peers. Following the ASA theory an IT professional would seek work in an organization where they perceive high

levels of person-organization-fit. An IT company therefore might be an especially attractive work place as it is highly influenced by the values of IT people.

This master thesis contributes to the research on IT culture by investigating differences between IT employees' satisfaction in IT companies and IT employees in non-IT firms, which might allow assumptions about the P-O-fit in the IT sector.

3. Employee satisfaction

3.1. Concept and research overview

Employee satisfaction is one of the most widely researched constructs in the field of organizational behaviour.¹ Investigating potential predictors and possible consequences of job satisfaction or dissatisfaction has been of academic interest for the last century. Judge et al. (2017) provided an overview of how theories and methodologies in this area of research have developed and been refined over the years. One of the most widely known definitions of job satisfaction was coined by Locke (1976), who described it as "a pleasurable or positive emotional state resulting from the appraisal of one's job or job experiences" (Locke 1976, p.1304 as cited in Judge and Klinger 2007, p. 394). Spector (1997) defines job satisfaction simply as "how people feel about their jobs and different aspects of their jobs" and as "the extent to which people like (satisfaction) or dislike (dissatisfaction) their job" (Spector 1997, p.2). Whereas Locke's definition focuses on the affective (or emotional) response to one's job, Spector emphasized the cognitive aspect to an individual's evaluation of one's job and its facets.

When measuring job satisfaction two different approaches are prevalent: Job satisfaction can be assessed as a global feeling one has towards one's job in general or it can be assessed as a construct of different facets and aspects of a job contributing differently to an individual's overall job satisfaction (Judge et al. 2017). The facet approach is useful to determine which parts of the job cause satisfaction or dissatisfaction and therefore can help organizations to identify areas of improvement. Some of the common facets of job satisfaction according to Spector (1997) include communication, co-workers, pay, promotion opportunities, working conditions, supervision, the organization itself, recognition and security. The global approach, meaning the general appraisal of one's job, allows to investigate the effects of employee

¹ As done by other authors (e.g. Spector 1997; Barakat et al. 2016) the terms employee satisfaction and job satisfaction are used interchangeably in this thesis.

satisfaction for instance on turnover intentions or performance (Spector 1997). Throughout the history of this field of research the extent of either the affective approach assessing the subjective feeling about one's job or the cognitive approach proposing a more objective evaluation of different job facets varied (Judge et al. 2017). Hulin and Judge (2003) conceptualized job satisfaction as multidimensional psychological responses to one's job including both cognitive (evaluative) and affective (emotional) as well as behavioural components.

Among the many models developed over the decades trying to explain causes and effects of job satisfaction, one theoretical approach will be highlighted here due to its relevance for the present study. The dispositional approach concerns the influence of personal attitudes and dispositions on job satisfaction. A number of longitudinal studies found that job satisfaction remained relatively stable over time even when individuals changed employers or occupations; some studies going as far as connecting emotional tendencies assessed in childhood with job satisfaction later in life or even insinuating a genetic predisposition of job attitudes as researchers found similar levels of job satisfaction with identical twins who were raised apart (Judge et al. 2017). Along with a persistence of attitudes over time the dispositional theory focuses on the notion that some people have a generally more negative or positive personal attitude in life, which is also reflected in their levels of job satisfaction. The Big Five or five-factor model of personality traits (openness, conscientiousness, extraversion, agreeableness, neuroticism) has been connected in multiple studies to workplace outcomes, such as job satisfaction, job performance, career satisfaction and financial success (Judge et al. 2017; Lounsbury et al. 2014). The important takeaway of the dispositional approach is that job satisfaction is to some extent determined by personal characteristics. However, it is important to note that the dispositional approach serves as an addition to the complexity of job satisfaction formation, as personal dispositions and situational conditions interact dynamically with each other.

Other theoretical approaches include the affective approach proposing that job satisfaction is an emotional response resulting from the comparison of an individual's job expectations and desires with the actual outcome of the job (Weiss 2002) as well as the mood- and event-based approach explaining the variability of job satisfaction within one individual over time (Judge et al. 2017). One of the most famous and most criticized models is Herzberg's two-factor-model explaining the occurrence of job satisfaction (or dissatisfaction, respectively) and motivation through so-called motivators or hygiene factors (Judge et al. 2017).

The extensive research into employee satisfaction over the last decades has yielded various implications. There is evidence of a relationship between job satisfaction and life satisfaction, as one's job experiences spill over into the nonwork life and vice-versa (Judge and Klinger 2008). Furthermore, job satisfaction has been related to physical health and psychological well-being (Spector 1997). O'Reilly et al. (1991) found P-O-fit, i.e. the alignment between an individual's and the organization's values, to be a significant predictor of job satisfaction, turnover intentions and normative commitment. By linking job satisfaction to certain workplace behaviours, research insights have resulted in practical implications for managers. Although correlations are typically small, studies have connected job satisfaction to absenteeism at work, turnover intentions, retirement decisions, psychological withdrawal behaviours and organizational citizenship behaviours (OCB), meaning behaviour that is not required by job description but beneficial to the employer (Judge and Klinger 2008). One of the most investigated links in the research history of employee satisfaction is the one between job satisfaction and job performance. Most of the studies' findings were either inconclusive or demonstrated a weak link. Job satisfaction does not necessarily lead to an increase in performance nor is good performance necessarily satisfactory. The causal structure is unclear since job satisfaction can either be cause or consequence of performance (Judge et al. 2017). It is however not surprising that the correlations to behaviours are relatively small, since they are complex in causality and are influenced by a multitude of factors.

3.2. Employee satisfaction in IT

With digitalization rapidly changing the world's economy and the consequential rise in demand for skilled IT professionals, learning about what influences their job satisfaction is of particular research interest for academics around the world. Particularly in emerging economies where the IT sector is a substantial driving factor of economic growth a number of papers on this topic have been published. Cinni (2014) studied the job satisfaction of 150 IT professionals in the Indian Kerala region, finding low levels of job satisfaction among software developers. Kanwar et al. (2012) compared workers from IT and ITES (information technology enabled service) organizations in the Delhi region, finding that the IT group had lower job satisfaction and organizational commitment than the ITES group as well as lower job satisfaction and higher turnover intent among females compared to their male colleagues. Employee engagement was proven to have a strong positive correlation with employees' job satisfaction in an Indian IT company (Kamalanabhan et al. 2009). Interesting results came from a South African study analysing work-life-balance, job satisfaction and turnover intentions of employees in an IT-

company. Results revealed a difference in race, as white people reported higher levels of job satisfaction and negative experience of work-life balance, whereas black employees experienced the opposite effect in both categories (Oosthuizen et al. 2019). These are just a few examples of an array of studies that examine job satisfaction among IT professionals from different perspectives. Due to the narrow national and sometimes even organizational scope of the sample, most findings cannot be generalized.

Considering dispositional theory in relation to IT personnel, Lounsbury et al.'s (2007) study, which tested the relation between IT professionals' personality traits and job satisfaction, is particularly valuable. Results demonstrated that the traits emotional resilience, extraversion, openness, teamwork disposition, assertiveness, customer service orientation, optimism and work drive were significantly positively correlated to job satisfaction. Additionally, emotional resilience, teamwork disposition and work drive were shown to account for 17.5 percent of job satisfaction's variance. Especially emotional resilience, indicating one's ability to handle job stress and pressure, stands out as the strongest predictor for IT employees' job satisfaction. This finding seems consequential as IT professionals are faced with demanding work tasks and often high workloads.

On the basis of online employer reviews, this thesis aims to identify which job aspects IT employees are more or less satisfied with. As mentioned above O'Reilly et al. (1991) found P-O-fit to be a significant predictor of job satisfaction. Since the IT employees in the sample work in either IT and non-IT companies a comparison of the facet satisfaction levels in both groups may provide indications of the P-O-fit in each group. Besides the main focus on determining the influence of the group membership (IT or non-IT employer) on employee satisfaction, other possible influencing factors such as hierarchical job position, job status (former or current) and the size of the company will be tested as predictors for IT employees' job satisfaction.

4. Hypothesis formulation

IT professionals work in both companies operating in the IT sector and in companies from various non-IT industries. IT employee satisfaction might vary based on the industry sector they are working in. IT professionals have distinct personality traits (Lounsbury et al. 2014) as well as a specific occupational culture (Jacks and Palvia 2014; Jacks et al. 2018). An investigation of the organizational culture in the IT sector (Schmiedel et al. 2016) revealed many congruencies with the IT occupational culture. This finding is consistent with Schneider's (1987) Attraction-Selection-Attrition model, claiming that people's personalities and values form and influence the organizational culture. O'Reilly et al. (1991) demonstrated that this fit between an individual's preference for a particular culture and the culture of the organization the person joins, is related to job satisfaction, commitment and turnover. Based on these theoretical considerations the following hypothesis is formulated:

H1: IT professionals working in IT firms indicate higher levels of overall employee satisfaction than IT professionals in non-IT firms.

Looking at the individual job facets a few assumptions may be derived. Based on the notion that IT professionals have distinct personality traits (Lounsbury et al. 2014) compared to other occupational groups, job facets referring to interpersonal dealings in working life would be expected to be rated higher by IT professionals working in IT firms, where a large part of staff consists of IT professionals.

H2a: IT professionals working in IT firms indicate higher levels of satisfaction with work atmosphere than IT professionals in non-IT firms.

H2b: IT professionals working in IT firms indicate higher levels of satisfaction with colleague relationships than IT professionals in non-IT firms.

H2c: IT professionals working in IT firms indicate higher levels of satisfaction with communication at work than IT professionals in non-IT firms.

43 percent of German IT employees alone work in the IT services sector, whereas the remainder is spread across a variety of industry sectors such as corporate administration and business consultancy (8 percent), wholesale (4 percent), automobile manufacturing (2 percent) and others (Statistik der Bundesagentur für Arbeit 2019). Since IT companies' core business is in the realm of information technology, it would appear that IT employers are especially interested in continually updating their IT workers on the latest knowledge status as well as providing

them with the appropriate equipment to ensure the company's success. Although the perception of how interesting one's job tasks are, is highly subjective and based on individual preferences, IT companies presumably provide IT professionals more innovative, creative, responsible and challenging job tasks than non-IT employers, due to their business focus. Based on these considerations, job facets concerning the job itself may be perceived as more satisfactory by IT professionals in IT companies than in non-IT companies.

H3a: IT professionals in IT companies indicate higher levels of satisfaction with career and further education than IT professionals in non-IT companies.

H3b: IT professionals in IT companies indicate higher levels of satisfaction with working conditions than IT professionals in non-IT companies.

H3c: IT professionals in IT companies indicate higher levels of satisfaction with interesting tasks than IT professionals in non-IT companies.

Considering the lack of females in the IT profession and the lower median age in the IT workforce (Statistik der Bundesagentur für Arbeit 2019) it may be assumed that social issues at the workplace such as gender equality or the treatment of senior colleagues are rated less favourably in a work environment consisting mostly of IT professionals compared to a more diverse staff.

H4a: IT professionals working in IT firms indicate lower levels of satisfaction with equality than IT professionals in non-IT firms.

H4b: IT professionals working in IT firms indicate lower levels of satisfaction with treatment of senior colleagues than IT professionals in non-IT firms.

As noted by the LinkedIn (2018) study as well as the survey by personnel service provider Robert Half (2018) salary expectations are a crucial contributor to the high employee turnover in the IT sector. *Compensation and social benefits* is therefore assumed to be a significant variable in the investigation of IT employee satisfaction. However, there is no previous research or indication that employers from the IT sector or the non-IT sector provide better compensation and social benefits to IT professionals than the respective other.

The same applies to other categories to be analysed in this thesis such as *environmental and social awareness, image, superiors' behaviour* and *work-life-balance*. All variables may contribute significantly to IT employees' satisfaction but there is no indication as to whether those job facets are considered more or less satisfactory by IT professionals working in IT

companies compared to ones working in non-IT companies. Potential results of this study concerning a difference between the two employer groups will be discussed subsequently.

5. Crowdsourced employer rating platforms

5.1. General concept

Be it purchasing a product, booking a vacation, eating at a restaurant or getting a haircut – people nowadays have multiple opportunities to look up reviews online before making the decision to purchase or make use of a certain service. For almost any consumption area of life there now exists a platform, where people can share their experience and opinion on a company, product or service. Platforms like Tripadvisor for hotels and restaurants, IMDB for movies, Amazon initially for books and now for many different types of products, and Google for all kinds of businesses offer within their review section highly influential information that may encourage or discourage consumers to purchase a specific product or choose a specific brand (Könsgen et al. 2018). The more people evaluate a product or a service on a rating platform, the more valuable the information (Sander et al. 2017), which explains the appeal of such platforms, as they cumulate the consumers' feedback (Dabirian et al. 2017). The power that consumers have on such platforms in shaping their peers' purchasing behaviours constitute an addition to the traditional marketing-based image portrayed by companies themselves. Consumer-induced information is often perceived as independent and therefore more trustworthy than the information spread by marketers (Bickart and Schindler 2001). Depending on how favourable the crowdsourced online opinion is towards a brand, these platforms can work for or against a company's marketing efforts. In consequence, it is getting increasingly difficult for marketing managers to control the company's online reputation. On the other hand, review platforms provide open consumer feedback that, if taken seriously, may be used to improve one's business.

Yet consumers are not the only stakeholders to share their experiences online. With the rise of several employer rating platforms, employees can voice their positive and negative opinion anonymously on their former or current employer. Those seeking information find employee reviews to be more credible than messages from corporate websites, as the person providing the review acts more independently and from a personal perspective (Kaur and Dubey 2014; Sander et al. 2017). Consequently, employer rating platforms impact a firm's reputation and attractiveness as an employer and therefore also the job-seekers' decision-making process on

where to apply: A German study conducted by Bitkom (Federal Association for Information Economy, Telecommunication and New Media) in 2018 showed that 45 percent of employed internet users have read employer reviews – young professionals being especially interested in the online-ratings. 84 percent of the respondents interested in switching jobs indicated to be influenced by employees' reports and grades online, whereby 46 percent felt reinforced in their decision to choose a certain company and 54 percent decided against a company after reading online employer reviews (Bitkom 2018a).

Another representative German survey from 2018 showed similar findings: 41 percent of the 1,000 people inquired stated, that they consult an employer-rating platform, such as Kununu or MeinChef.de before applying to a job offer. The study also gives an insight into the impact of online ratings on employers' reputation, as 43 percent of respondents consider it important that their current or future employer is rated positively. A negative rating of their employer is even regarded as embarrassing by 32 percent of those surveyed. Furthermore, survey participants were asked about the motivation to write a review. Although 66 percent of respondents acknowledge that unhappy employees are more inclined to write a bad review whereas satisfied employees rather not write any review, 35 percent reported to rate their employer themselves to convey a realistic impression to potential new colleagues (Von Rundstedt 2018).

This new form of electronic word of mouth regarding firms, their brands, their offerings and their roles as employers requires managers to re-evaluate their employer branding strategies and ways of trying to attract and retain talent. It poses the question of how managers should understand and manage the information available on employer rating-platforms. What implications does it have for the HR management when setting strategies in order to retain current employees? What should managers focus on to compete successfully in the war for talent (Dabirian et al. 2017)?

5.2. Employer rating platforms as research interest

Researchers have dealt with the topic of rating platforms mainly from a marketing perspective, focusing on the influence of product- and service-reviews on consumer behaviour (Bickart and Schindler 2001; Jiménez and Mendoza 2013; Purnawirawan et al. 2012; Purnawirawan et al. 2015). Only recently research has started to explore the value of the information gathered on crowdsourced employer rating platforms and possible consequences for companies as well as current and potential employees. Green et al. (2019) for example considered the employee crowd as a source of fundamental information on their employing company and studied a

potential correlation between crowdsourced employer reviews and stock returns. They found that there is indeed a relation between employee assessments of “career opportunities” and “views on senior management” and stock returns. It showed that employer rating changes are associated with growth in sales and profitability and help predict earnings announcement surprises one quarter ahead. In an experiment, Klein et al. (2018) analysed the motivation of employees to write an employer review online. Results show that people are more likely to leave online reviews when they are reminded that doing so helps other job seekers. Simple pro-social incentives – as well as monetary incentives – also led to the distribution of reviews being less biased. Könsgen et al. (2018) examined the effects of discrepant company reviews on the perceived trustworthiness and related application intention of job seekers. The researchers discovered that high levels of discrepancy do indeed negatively affect the motivation to apply and intention to pursue employment. Sander et al. (2017) also investigated the perceived trustworthiness of employer-rating platforms among German respondents and found that people with more work experience have a tendency to be more trusting in online employer reviews. Dabirian et al. (2017) conducted a study analysing a large number of reviews on the American employer rating platform Glassdoor in order to identify certain value propositions provided by employment and the different weights of importance of those benefits. With further research based on this data, Dabirian et al. (2019) focussed on IT employers by classifying eight values that IT professionals care about when evaluating an employer, as well as giving recommendations on how IT employers may use online information to improve their employer branding strategies. The focus on IT workforce within the analysis of crowdsourced employer reviews is also subject of Schmiedel et al.’s (2016) study attempting to identify factors of organizational culture that are relevant in the IT industry.

Research making use of crowdsourced employer rating platforms is still in its beginning stages. The studies mentioned above are among the first to examine the effects of employer reviews on potential job candidates and company business. Hence, Könsgen et al. (2018) and Dabirian et al. (2017) call for further research in this area, recommending approaches that e.g. look at specific employer types or consider a comparison between small and large companies’ reviews as well as further investigating employees’ motivation to provide feedback on crowdsourced employer branding sites.

This thesis adds to the current state of research by focusing specifically on one group of employees whose skills are rare and in high demand. Even though IT professionals have already been singled out in Dabirian et al.’s (2019) follow-up research paper on employer value

propositions identified in the textual parts of online reviews, as well as in Schmiedel et al.'s (2016) study on factors of organizational culture indicated in employer reviews of IT companies, the research presented here differs from that mentioned above in several aspects.

Firstly, this study is based on data from the largest employer rating platform in the German speaking area Kununu, as opposed to Dabirian et al. and Schmiedel et al. who used the US-American website Glassdoor. By using Kununu as a data source, the study is able to draw more specific conclusions about IT personnel in Germany in times of shortage of skilled IT people.

In terms of methodology Dabirian et al. (2019) and Schmiedel et al. (2016) relied on automated content analysis of the textual parts of company reviews, whereas this study concentrates on the evaluation by Likert scale. Narrowing the research to the ordinally scaled data allows for a quantitative approach in data analysis and increased representativeness, despite the hindrance of having to gather the data manually.

Most importantly however, this research not only aims to identify which factors contribute most to job satisfaction of IT professionals in Germany, but also provides a comparison between IT employees' satisfaction in IT companies and non-IT companies as well.

5.3. The employer rating platform Kununu

This study is based on data available on the employer review site Kununu. With over 3.5 million reviews on more than 900,000 companies as of July 2019 Kununu is the largest employer rating platform in the German-speaking area (Binner 2018; Kununu Infocenter accessed 07/2019). The company was founded by brothers Martin and Mark Poreda in 2007 in Vienna, whose business-idea grew out of their own experience. When trying to get information about a potential new employer, the founders noticed the lack of first-hand reports from employees comparable with the online reviews by costumers on products or services (Karle 2019). The name Kununu stems from Swahili language and means "blank paper", which is meant to represent all the companies that have not yet been evaluated on the website. Since 2013 Kununu is a full subsidiary of the German career-platform XING. Kununu was able to keep its own brand and profit from a wider reach as well as gaining more reviews. With the sale of the company, the founders left Kununu to pursue new business ideas (Kununu Blog 2015; Kununu als Arbeitgeber accessed 07/2019; Xing kauft Kununu 2013).

In 2016 Kununu ventured the step into expansion to the US-market. In order to face the highly competitive market and the incumbent employer rating giant Glassdoor, Kununu formed a joint venture with the second most visited career-platform Monster. Kununu tries to differentiate

itself from Glassdoor by offering up access to all reviews and areas of the site without requiring the user to log in. The platform also asks reviewers to rate across more categories than Glassdoor, including ratings for how well colleagues get along, how older colleagues are treated as well as the organization's brand as an employer. Despite a sharp increase in the number of reviews and rated companies, Kununu was not yet able to turn business profitable in the USA (Scheppe 2019). The company employs around 100 people in Vienna, Porto, Berlin and Boston (Kununu als Arbeitgeber accessed 07/2019).

The platform gives former and current employees, interns, apprentices and applicants an opportunity to share their experiences with their employing company – anonymously and free of charge. The goal of the employer-rating platform is to provide jobseekers with an authentic image of a company when researching a potential employer. In doing so, Kununu strives to balance out the asymmetry of information. While jobseekers ordinarily have only limited access to information about a possible employer, which is mainly generated by the company itself (company website, job description etc.), an employer has multiple options to search out a suitable employee (job interview, assessment center, references from former employers etc.). By making “insider-information” available, Kununu helps jobseekers to form an idea of what the workplace really looks like before initiating the recruitment process (Kununu Infocenter accessed 07/2019).

The free services aimed at jobseekers represent an integral part of Kununu's business concept. Therefore, company profiles and employees' ratings are accessible without registration. Registration is free of charge but required in order to write an employer review. This is meant to prevent manipulation, such as redundant spam reviews, defamation of competitors or skewing of one's own rating by writing multiple positive reviews.

Satisfied employees stand at the core of every successful business and are a result of good personnel policies. The impact of such platforms on the employer brand cannot be underestimated. Kununu argues that the reviews are not only useful for interested jobseekers but for employers as well. Companies may use the honest feedback on the platform to improve their management but also to administer their employer brand by responding to reviews and answering questions. Kununu therefore offers companies memberships to shape their presence on the platform. Firms may choose between a free profile that enables them to see reviews and comment on them or a fee-based employer branding profile. The latter includes several options of self-representation such as the integration of photos, logos and image videos as well as an incorporation of the profile into social media activities. Companies with an employer branding

profile also profit from the connection to Kununu's parent company XING. The profile membership applies to both platforms. This way a company's job offers on XING can be incorporated on Kununu's employer branding profile, allowing for a wider reach among jobseekers. In addition, members receive daily statistics from both XING and Kununu about the users and visitors in order to better measure and manage employees' feedback (Kununu GmbH Zendesk accessed 07/2019). Since 2016 a top membership option called employer branding profile professional is offered as well, including four additional features: an FAQ that might be of interest for potential job candidates, a news area that allows companies to publish the latest news on their Kununu profile, "job insights" where current employees present their everyday professional life to provide jobseekers with more background information and "Kununu score reporting" where companies can compare their scores by different categories with their competitors' (Kununu Blog 2016). The monthly price for an employer branding profile is scaled by number of employees. According to Kununu the employer branding profiles are the main source of revenue (Kununu Infocenter accessed 07/2019).

Kununu also awards two kinds of seals of approval: "TOP company" (requisites are a minimum of six reviews and a score average above three) and "OPEN company" (at least one of three premises must be fulfilled: the company actively invites employees to write reviews, the company comments on reviews or the company has an employer branding profile (Kununu GmbH Zendesk accessed 07/2019). Furthermore, the platform runs a blog where it publishes catchy articles such as rankings based on data gathered by Kununu.

On the website users can search for a specific company or limit the search by branch of industry, location, specific benefits provided, a Kununu score from one to five stars and Kununu's seals of approval. Each company's profile has an overview at the top with the Kununu score (average of all reviews by employees, apprentices and applicants), a percentage of how many reviewers would recommend this employer, the number of employer comments and number of profile views. Depending on if the company has an employer branding profile membership, the overview contains general company information, photos, job offers etc. Below the company's self-representation (if available) platform users can read the most recent reviews. By clicking on the review-section, users get further information. Kununu provides a statistical summary: number of employees' reviews, apprentices' reviews and applicants' reviews. Each group is broken down into its own assessment categories with the corresponding rating averages as well as an overall average score and recommendation rate. This thesis focuses on reviews by employees only. Kununu's evaluation categories are methodically based on the model of the

European Foundation for Quality Management (EFQM) and follow its standard of a holistic approach to organisations (Kununu Pressefragen accessed 07/2019). There are thirteen assessment categories among which *work atmosphere*, *superiors' behaviour*, *colleague relationship*, *interesting tasks*, *communication*, *working conditions*, *environmental- and social awareness* and *work-life-balance* are labelled as feel-good-factors by Kununu. The categories *equality*, *treatment of older colleagues*, *career and further education*, *compensation and social benefits* and *image* are marked as career factors. In order to better understand the meaning behind each evaluation category, Kununu provides reviewers with further explanations when filling out the evaluation-mask (Kununu Bewertungsmaske accessed 09/2019).

- *Work atmosphere*: employees evaluate typical influencing factors on work atmosphere such as praise by superiors or general efforts by the firm to create a fair and trusting work climate.
- *Superior's behaviour*: employees evaluate how their superiors manage conflict, the level of involvement and transparency of decision-making processes and if expectations are set realistically.
- *Colleague relationship*: employees evaluate how well colleagues work together and how honest and open they communicate.
- *Interesting tasks*: employees evaluate if the workload is distributed fairly and if they have some independence and freedom in the execution of tasks.
- *Communication*: employees evaluate if they receive all information necessary for their job as well as how well they get informed in regular meetings about the company's results and successes.
- *Equality*: employees evaluate if women are given the same career opportunities and if re-entering employees are disadvantaged.
- *Treatment of senior colleagues*: employees evaluate if older workers get hired and if senior colleagues are appreciated, supported and given equal opportunities.
- *Career and further education*: employees evaluate if the company offers career-prospects, if personal and professional development is promoted through continuous training as well as the transparency of career growth opportunities and criterions.
- *Compensation and social benefits*: employees evaluate if compensation is fair considering workload and responsibilities, if salaries are paid on time and if social benefits are offered.

- *Working conditions*: employees evaluate if the environment is comfortable and suited to work tasks, if there is proper temperature, lighting and ventilation control and if computers and technology comply with the job's requirements.
- *Environmental and social awareness*: employees evaluate if concerns for environmental and climate protection are demonstrated and if the company supports "fair" trade.
- *Work-life-balance*: employees evaluate if working hours are within the normal range, if leave can be taken anytime, if families are considered and if there is pressure to work long hours.
- *Image*: employees evaluate if the employer is well regarded among colleagues and if the image is consistent with reality.

Each review indicates at which company the author works and in what location, their job status (former or current), their position (management, employee, student trainee, intern or temporary employment), their business division (for example IT, administration, marketing, logistics etc.) and the date of posting. The review is structured by the thirteen categories of which each can be evaluated by a Likert-scale of one to five stars. The reviewer also has the option to comment further on each category as well as write about the pros and cons and give suggestions for improvement. At the bottom of each review the employee can choose icons symbolizing the benefits the firm offers (for example childcare, accessibility, parking space etc.). The reviews can be sorted by relevance (preference given to reviews with text), date and point score. They can also be filtered by firm-subsiary, location, business division, evaluation category, date and employer's comment.

The platform is well-organized and filled with content. The help center section is divided into subsections "about us", "employees" and "companies", each containing links to FAQs on Zendesk as well as links to Kununu's products and services and contact information. This way, Kununu presents itself as an information intermediary between jobseekers, current employees and companies. Information obtained from the website on one hand gives jobseekers an impression of the working environment and on the other hand illustrates to employers the state of their employer brand.

5.4. Criticism

Naturally, Kununu and other employer rating platforms have attracted some criticism regarding the authenticity of reviews, credibility of reviews and conflicts of interest. Kununu states that the employer branding profile memberships paid by companies, is their main source of income (Kununu Infocenter accessed 07/2019). This poses the question of how the platform balances the act of publishing supposedly honest employer reviews that – if negative – might even hurt the company's reputation and on the other hand selling memberships to those companies in order to improve their employer brand. Kununu is financially dependent on the sales of employer branding profiles and therefore needs to keep its customers happy. The core of the business idea – providing transparent and insightful information about a workplace to jobseekers – could be interpreted as working against the concept of forming an attractive employer brand. How much influence do paying customers have on what is written about them on the platform? Kununu informs in its “about us” section that each customer has to sign a paragraph in their terms and conditions stating that advertisers (i.e. employer branding profile customers) cannot take any influence or control of the reviews on them as an employer. If the customer exerts pressure on that matter, Kununu reserves the right to terminate the business relationship (Kununu Infocenter accessed 07/2019). Some still might argue that mixing employer generated content for human resource marketing purposes with employees' reviews, is contrasting the original idea of the founders to make honest information about the workplace available. Kununu counters the argument in the “Frequent Press Inquiries” section by pointing out, that employer branding profiles and user generated content are clearly distinguishable on the platform. Furthermore, they want to encourage transparency and open dialogue, which is why Kununu allows companies to comment on reviews free of charge (Kununu Pressefragen accessed 07/2019).

A further issue is the question of how representative the reviews are for a company as whole. According to the numbers provided on the bottom of Kununu's website, the platform has collected 3,580,000 authentic evaluations of 908.000 companies as of July 2019. This means that on average there are approximately just four reviews per company available. For a business with five employees, four reviews could give an authentic portrayal of the workplace. But how representative are the numbers for big corporations, which constitute the largest part of the employers reviewed on the platform? The car manufacturer BMW has about 81,000 employees in Germany (Frohn 2019). Kununu counts 2,286 reviews for BMW, which represents only 2.8 percent of the workforce. Moreover, this does not account for how greatly employee satisfaction

may vary between locations and divisions due to different management styles. Irrespective of the sheer numbers, Kununu reasons that companies should take reviews seriously as they have a wide reach and contribute to opinion formation of jobseekers, competitors, customers and the public in general. However, it is important to keep in mind that reviews are in themselves still a form of word of mouth and therefore highly subjective. The more reviews, the more well-rounded the portrayal of an employer is. In that sense, a platform that gathers reviews is an improvement to the non-digital era of word of mouth, where people trusted the experience-reports of a few friends and acquaintances (Kununu Pressefragen accessed 07/2019).

Nevertheless, the principle of “the more the better” still applies to the goal of reaching a representative level of employer evaluation. Kununu currently records a monthly 15 percent increase in reviews but wants to also shift responsibility onto the companies themselves. The companies should have an interest into being well represented on the platform, that is why Kununu suggests to actively invite employees to leave reviews on their platform (Kununu Pressefragen accessed 07/2019).

However, active e-mail calls directed at employees can be problematic as they are rarely worded neutrally. Depending on the tone of the invitation only a certain group – either happy or unhappy employees – feels engaged and motivated to write reviews. Kununu itself sends out such calls to subscribers of the XING- and Kununu-newsletter (Kununu GmbH Zendesk accessed 07/2019). In 2016 the blog “Personalmarketing 2Null” reported on those mailings. The calls ranged from phrases like “Turn your employer into the best” to “Always keep smiling and nodding – Enough of that! Let us know what you really think about your employer!”. It is obvious that these kinds of invitations are meant to generate certain types of reviews – positive or less favourable. Kununu explained these newsletters as trials for different wording triggers in order to find out which ones users respond to the most (Knabenreich 2016). With these e-mails, Kununu manipulates the sentiments of employees, who consequently may write reviews of a certain kind. Moreover, even if the invitation to evaluate the employer does not come from Kununu directly, companies themselves can also pressure their employees into writing positive reviews. This begs the question of how safe and anonymous the reviewers really are on the platform?

Kununu assures users repeatedly that data protection is of foremost importance and the participation in the evaluation is fully anonymous (Kununu GmbH Zendesk accessed 07/2019). Nevertheless, in cases of small businesses and business divisions with few employees, it is often

not very hard for managers to guess who has written a certain review. Especially when it comes to negative reviews, it is unlikely that the employee's frustrations were completely unknown to the bosses, which may raise suspicions as to who the author of unfavourable reviews might be. Details included in the review such as the date of posting, location, business division, position and job status, can be indicators of the person who wrote the review. In a newspaper article about handling negative online employer reviews, the CEO of a small HR service provider is quoted saying that he was able to directly trace two negative reviews to two former employees who wanted to take revenge on the platform. In consequence of this retaliatory utilization, Kununu took down the reviews (Scheele 2018).

Under no circumstances will Kununu disclose a user's identity to an employer. If the authenticity of a review is in doubt, Kununu requests some form of evidence and confirmation of the employment. When the reviewer is not able to sufficiently prove the claims made in the review, it gets removed (Kununu GmbH Zendesk accessed 07/2019). Despite the given anonymity, users should be aware that leaving a negative or hateful review might not only harm the company's reputation but may in the worst case lead to legal actions.

Anonymous reviews guarantee freedom of expression, but this freedom can also be misused to achieve certain objectives. In the case described in the article, an employee was dismissed because of irregularities and later retaliated by spreading falsehoods and defaming the company on the platform. An applicant for an internship who didn't get the position, did the same (Scheele 2018). Sometimes an employee's dissatisfaction cannot be solely attributed to the employer. Kununu established rules to ensure the platform's integrity and to prevent retaliatory utilization: (1) people may not be named or described in a way that would make them identifiable, (2) publishing of internal information is prohibited, (3) no criticism of products, (4) discriminating, racist, political, defaming, insulting and vulgar expressions are forbidden, (5) links to foreign content are not allowed, (6) only the employer and not the intermediary such as a recruitment company can be evaluated, (7) the differentiation between applicants' reviews and employees' reviews must be respected; only one review in each section may be posted by the same person and (8) only personal opinion and experiences can be expressed; a generalization of facts may be challenged by the employer (Kununu GmbH Zendesk accessed 07/2019). These regulations are not only meant to forestall misuse by unhappy employees, but also frivolous utilization by trolls whose aim is to senselessly provoke the online community as well as competitors who want to weaken their counterparty's position as an employer in the labour market (Ingrassia 2017).

In the Q&A of the platform's helpdesk, Kununu discourages companies from asking reviews for them to be deleted, but instead recommends facing the criticism and reacting in a comment (Kununu GmbH Zendesk accessed 07/2019). If a company decides to challenge a review for claims of falsehood and defamation, the burden of proof lies with the reviewer. This course of action seems to anger many users: on the rating platform Trustpilot Kununu only achieves a one out of five star rating (as of July 2019). Most of the commentators express frustration with Kununu's policy of deleting negative reviews and accuse them of censorship. Many also complain that it is almost impossible to provide proof for grievances in the workplace (Trustpilot). Due to legal safeguards, Kununu's proceedings can lead to deletion of reviews in cases of doubt, but the platform insists that it cannot be manipulated by companies (Poreda 2012).

Misuse of the platform cannot only happen in the form of false, negative reviews but in form of non-authentic, positive reviews as well. Employers might try to boost their employer brand on Kununu and compensate for negative remarks by either obliging employees to write positive reviews or even engaging third parties to do so (Ingrassia 2017). In order to ensure reliability of the reviews, employer rating platforms must manage the balancing act of ensuring the users' authenticity on the one hand and on the other hand preserving anonymity and protecting data. Kununu's control system relies on technological filters that detect personal information and vulgar language. In addition, it makes sure that each e-mail address is confirmed and used for only one review per employer. Reviews that do not pass the filter are checked manually by the quality team. In case of a violation of the rules, the reviewer is asked to adjust their remarks. Positive reviews therefore have a higher chance of passing through the filter and being published more quickly. Moreover, both users and companies have the option of reporting questionable content to the support team who will conduct a thorough examination (Kununu GmbH Zendesk accessed 07/2019). Although these procedures and initiatives help to establish the reliability of information to a certain extent, the checks on users' identities are imperfect at best. Guaranteeing absolute authenticity is simply impossible without compromising the users' anonymity.

6. Methodology

The foundation of this thesis' analysis is data collected manually from Kununu's website in July 2019. Only reviews from IT employees in IT and non-IT companies were gathered. The study analyses the assessment of the thirteen job review categories by Likert-scale (one to five stars; five stars being the best grade). Further text and commentary within the reviews were not recorded and are not part of the study. Reviews by apprentices and applicants were excluded, too, as they evaluate employers by different criteria. Apprentices usually have different working conditions than employees as they are learning the trade and usually attend vocational school at the same times. Applicants do not review the employers themselves but rather the companies' application processes. Therefore, the three groups are not comparable in terms of employer evaluation.

The classification of IT and non-IT companies is oriented towards Kununu's categorization of companies in industrial sectors. There are various non-scientific definitions of a "tech company" or "IT company" (Heath 2017). For this reason, only companies categorized as operating in the "information technology/software" sector were accounted for as IT companies for purposes of this study. This primarily includes companies whose product or service is technology. By this definition, celebrated tech companies such as Amazon and Airbnb do not qualify. In order to not skew the results, companies that are classified by Kununu as "Internet/Multimedia" were excluded from both test groups. Non-IT companies were gathered from the sectors "automotive", "medicine/pharmaceuticals", "industrial sector", "transport/logistics", "service", "healthcare", "insurance", "HR/recruitment", "telecommunication", "public service" and "commerce/consumer goods".

In order to get a well-rounded insight into IT employees' satisfaction, reviews were selected among IT and non-IT companies performing both above and below the overall evaluation average on Kununu were selected. The platform indicates an average of all the reviews at the bottom of the website as well as an average for each sector. As of July 2019, the Kununu score amounts to 3,38 stars based on all 3,585,000 reviews; the IT sector score is 3,77 stars calculated from 207,005 reviews.

Kununu lists the companies in the search result in the order of relevance, i.e. by the overall number of reviews an employer has on the website. For this study companies were selected manually going by the order of relevance, choosing equal amounts of companies performing

below and above Kununu average. All companies selected have a minimum of 120 overall reviews.

Furthermore, the results of the German “Most attractive Employer Ranking 2018” by Universum Global were included as selection criterion to narrow down the large amount of potential companies to be included in the sample. Universum Global is a global leader in employer branding consulting industry. The company puts out yearly rankings on the most attractive employers, organized by country, student or professional status and occupation. Companies that were rated among the top 50 most attractive employers by young IT professionals and students were incorporated in the present study (Universum Global 2018). Interestingly, employers that were perceived as attractive according to the Universum Global 2018 survey were found to be rated both above and below the Kununu average.

In summary the companies were chosen as followed:

- 10 IT companies below average (IT-sector score: 3.77) in order of relevance, minimum of overall 170 reviews, companies from “most attractive employer ranking 2018” by Universum Global included.
- 11 non-IT companies below average (Kununu score: 3.38) in order of relevance, minimum of overall 320 reviews, mix of business-sectors.
- 10 IT companies above average (IT-sector score: 3.77) in order of relevance, minimum of overall 120 reviews, companies from “most attractive employer ranking 2018” by Universum Global included.
- 11 non-IT companies above average (Kununu score: 3.38) in order of relevance, minimum of 520 overall reviews, companies from “most attractive employer ranking 2018” by Universum Global included.

Due to the obvious fact that the quota of IT professionals in IT firms is higher than in non-IT firms, there are less reviews by IT employees in non-IT firms compared to IT firms. Therefore, two additional companies were included in the non-IT group.

The aim was to gather forty IT employee reviews per company, if available. Smaller, foreign and non-IT companies especially, often had less IT reviews than the intended number and the reviews were spread out farther across time. As employee satisfaction may change in the course of time for example due to changes in management and strategy, only reviews written until the end of 2017 were included, starting with the most recent and going back three years in time.

The following data were gathered from each review:

- Date of posting.
- Job position either employee (n=925) or management level (n=230). Job positions such as working students, interns and temporary employment were excluded. Due to the time-limited nature of their employment, these employees are often less integrated, have little opportunity to grow and take responsibility. They therefore assess their employer by different standards.
- Job status either current (n=1006) or former (n=149) employee. Unspecified job positions were excluded, in order to get more conclusive results about the evaluation differences between current and former employees. However, it must be acknowledged that this could pose a potential bias as people may have decided to share less information to protect their anonymity.
- Thirteen evaluation categories graded one to five stars. Reviewers indicate their satisfaction with the job attributes *work atmosphere*, *superiors' behaviour*, *colleague relationship*, *interesting tasks*, *communication*, *working conditions*, *environmental and social awareness*, *work-life-balance*, *equality*, *treatment of senior people*, *career and further education*, *compensation and social benefits* and *image*. Reviewers who did not rate all categories were excluded to allow comparability between all categories.
- Average score of each review calculated from the grading of the thirteen categories. In this study the average score is used to indicate the reviewer's general employee satisfaction. The most common methods in job satisfaction literature are measures of overall satisfaction, asked as single-item questions or measures of facet satisfaction, where respondents indicate their level of satisfaction regarding different elements of their job (Spector 1997). Both methods have advantages and disadvantages depending on the context of research. It is however important to note that overall job satisfaction resulting from single-item measure and multiple-item measure are not equivalent (Highhouse and Becker 1993). In this study, the overall employee satisfaction is the sum of facet satisfaction.
- Company's name.

Presumably for the sake of anonymity the reviews do not indicate the gender of the reviewer, which otherwise could have yielded interesting results concerning gender differences in employee satisfaction. Further information recorded includes the industry sector in which each company is operating, if it is an IT firm (n = 560) or non-IT firm (n = 595), the company's Kununu score to indicate if it is performing below (n = 493) or above (n = 662) Kununu average

and the company's overall number of reviews as of July 2019. Altogether a sample of 1155 reviews was collected from Kununu's website.

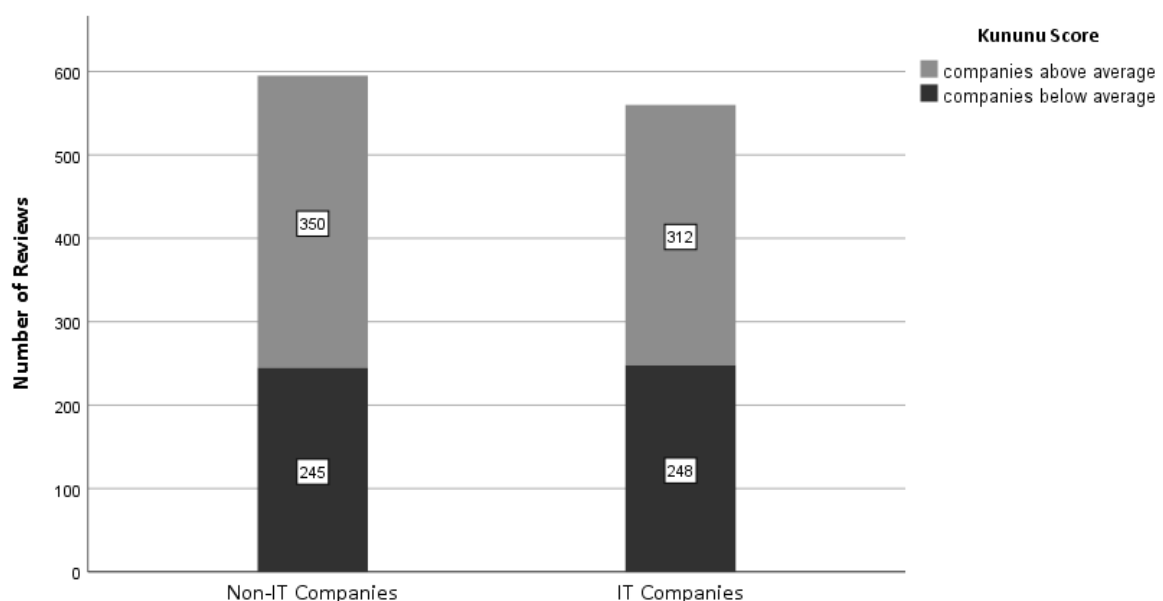
In addition, company details such as the number of employees worldwide, founding year and revenue generated in 2018 in euros were acquired from companies' websites, fact sheets, annual reports or outside sources of information such as the biggest German financial portal finanzen.net and Germany's leading provider of market and consumer data Statista (see appendix 1). These datapoints will be used as predictors in the linear regression models.

7. Empirical results

7.1. Descriptive analysis

The following analytical approach is based on Field (2018) and Hemmerich (2019). All statistical analysis was carried out using the software program IBM SPSS. The composition of the dataset was described in detail in the previous chapter. The study sample comprises 1155 online reviews. The following graph illustrates the division of the sample in reviews from IT-professionals in IT companies ($n = 560$) and non-IT companies ($n = 595$) as well as the number of reviews from companies below and above Kununu average. 41 percent of reviews from non-IT firms came from companies performing below the Kununu average and 44 percent of IT firm reviews, respectively.

Figure 1: Frequency of non-IT and IT companies in the sample



Looking at the two groups “non-IT companies” and “IT companies” individually, IT professionals evaluated their employers from the non-IT field with an average of 3.83 stars, whereas IT employees in the IT industry assessed their employers with a mean value of 3.66 stars. The standard deviations were 1.01 for non-IT employers and 1.19 for IT employers respectively. With a scale from one (“very bad”) to five (“very good”) stars (Kununu Bewertungsmaske accessed 09/2019), the averages in both groups rank in the upper midrange and suggest reasonable satisfaction of IT employees with their employers (see appendix 2).

When comparing the average evaluation scores of IT employees in IT firms and non-IT firms, via independent samples t-test, the following results were found: There was a statistically significant difference with a small effect between general employer satisfaction in IT companies and non-IT companies, with mean evaluation score 0.174 points (95%-CI[0.046, 0.302]) lower for IT companies, $t(1098.87) = 2.67$, $p = .008$, $d = .16$ (see appendix 2). This indicates that the IT professionals in the sample are slightly more satisfied working in non-IT firms than in IT-firms. Therefore, this result clearly contradicts hypothesis H1 by in fact demonstrating the opposite effect.

The job position (employee or manager) and job status (former or current) of the IT employees included in the sample can be influential on the reviewer’s job satisfaction. 80 percent of the reviews were by employees ($n = 925$), assessing their employers with a mean of 3.67 stars, standard deviation 1.13. On the other hand, 20 percent of the reviews in the sample came from IT professionals in management positions ($n = 230$), whose employer evaluations average to a “good” grade, mean value of 4.05 stars with a standard deviation of 0.89. The independent samples t-test reveals that the difference between average evaluations is significant with a medium effect, $t(433.68) = -5.45$, $p < .001$, $d = -0.523$, signalling that managers are more satisfied with their employing company than employees (see appendix 3).

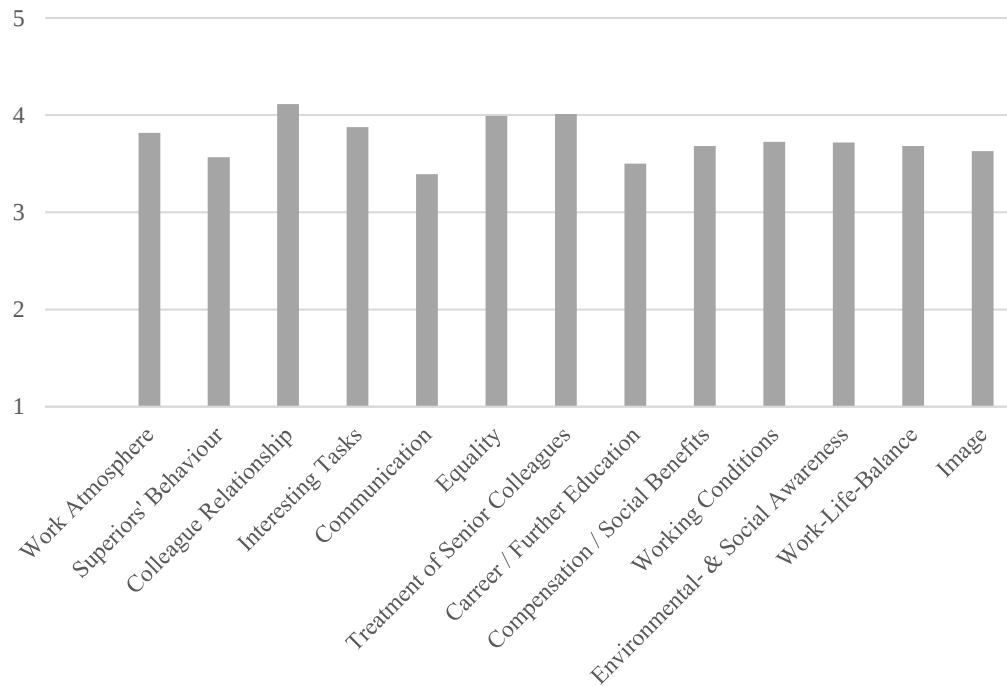
The frequency of reviews by former IT employees amounted to 12.9 percent in the sample ($n=149$), whereas the majority of reviews (87.1 percent) came from IT people currently working in the company reviewed ($n=1106$). The average evaluation score for former employees is rather low with 2.71 stars and a standard deviation of 1.05, while current employees reviewed their employers with an average of 3.9 stars, standard deviation 1.03. Once again the independent samples t-test reported a significant difference of strong effect between average scores of former and current IT employees, $t(1153) = -13.19$, $p < .001$, $d = -0.77$ (see appendix 4). Not surprisingly, former IT employees evaluate their employers less favourably than current

employees. Possible explanations could be either that an employee left the company because they were unhappy with the employer and is therefore leaving a bad review or the termination of employment caused the employee to air their grievances online in order to hurt the company's reputation (Scheele 2018).

The next step is to examine the individual job attributes by which the IT professionals graded their employers and expressed their satisfaction with the job. The thirteen evaluation categories present different facets of a job that contribute to employee satisfaction or dissatisfaction. The chart below shows that all categories were rated on a similar level by IT employees as averages ranged from 3.39 for *communication* to 4.11 for *colleague relationship*. According to Kununu (Kununu Bewertungsmaske accessed 09/2019) the opposite ends of the five star scale translate into one star equalling a "very bad" assessment to five stars equalling a "very good" assessment. The average evaluations of each category therefore suggest that IT professionals are fairly satisfied with all facets of their job. The modes corroborate this assertion, as the most common rating in each category was five stars except for *communication* (4 stars). The standard deviation for each attribute ranges from 1.106 for *colleague relationship* to 1.465 for *superiors' behaviour*, which shows that the number of outliers is relatively similar in every category. The median is 4 stars for every category except for *treatment of senior colleagues* with five stars (see appendix 5). These observations confirm that the IT-employees in the sample are quite satisfied with the different aspects of their job. The mean value of all categories combined amounts to 3.75 stars, which further corroborates the overall positive job assessment of IT professionals.

Although IT employees' evaluation of each job facet indicated moderate to high satisfaction, it should be noted that the category *communication* has the lowest rating of all categories and is the only category with a mode of 4 stars instead of 5. This suggests the chain of communication in their employing company leaves something to be desired for IT employees. On the other end of the spectrum, the category *colleague relationship* was assessed highest with an average of 4.11 stars which shows that IT professionals appreciate their work-relationships and feel comfortable with their colleagues.

Figure 2: Average ratings (N=1155) of evaluation categories



Due to the high frequency of five star assessments in each category, the distributions exhibit a clearly left-skewed form (see appendix 5). Therefore, none of the valuation categories can be considered normally distributed, as evidenced by the negative skewness and additional visual inspection of the histograms.

Spearman-Rho-Correlation

After the first observation of the individual variables, table 1 shows if and how the variables correlate with each other. As the thirteen job attributes (predictors) are ordinally scaled, the Spearman-Rho-correlation test was used, whereby variables are ranked first and then a correlation calculation is applied to those ranks. The dependent binary variable – company reviewed is an IT or non-IT firm – is not included in the correlation calculation as results correspond with findings from the Mann-Whitney-U test, that will be discussed in detail later.

The first result to be noticed, is that the thirteen evaluation categories are all significantly related to each other. Regarding the data that was collected additionally as predictors to be used in the linear regression analysis the following correlations were found: the number of employees in a company was significantly related to how well *communication*, *treatment of senior colleagues*, *compensation and social benefits*, *working conditions* and *image* are evaluated. The founding year of a company is significantly negatively correlated to *compensation and social benefits*,

work-life-balance as well as *image*, meaning that the younger a company, the lower it is rated in those categories.

The higher a company's revenue in 2018 was, the better it was evaluated for *communication*, *compensation and social benefits*, *working conditions*, *work-life-balance* and *image*, as there is a significant positive relationship between the revenue and the categories listed.

Since a company's Kununu score is in part calculated from IT people's evaluation of the thirteen job attributes it is unsurprising that a company's performance being below or above the Kununu average score is significantly correlated to all thirteen evaluation categories.

Table 1: Spearman-Rho-Correlations

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Evaluation Categories																	
1 Work Atmosphere	1																
2 Superiors' Behaviour	.757**	1															
3 Colleague Relationship	.633**	.608**	1														
4 Interesting Tasks	.663**	.664**	.557**	1													
5 Communication	.746**	.721**	.566**	.647**	1												
6 Equality	.651**	.634**	.563**	.592**	.601**	1											
7 Treatment of Senior Colleagues	.670**	.670**	.581**	.600**	.609**	.691**	1										
8 Career / Further Education	.709**	.712**	.537**	.704**	.707**	.625**	.631**	1									
9 Compensation / Social Benefits	.568**	.588**	.446**	.618**	.599**	.518**	.518**	.672**	1								
10 Working Conditions	.704**	.657**	.511**	.635**	.698**	.590**	.607**	.690**	.645**	1							
11 Environmental- / Social Awareness	.673**	.657**	.527**	.630**	.685**	.571**	.611**	.672**	.622**	.700**	1						
12 Work-Life-Balance	.655**	.652**	.508**	.547**	.637**	.605**	.639**	.617**	.603**	.663**	.650**	1					
13 Image	.677**	.667**	.502**	.666**	.687**	.596**	.582**	.720**	.653**	.704**	.679**	.596**	1				
Firm-related Variables																	
14 Number of Employees (2018)	-0.035	-0.001	-0.021	0.036	.082**	-0.032	-.074*	0.016	.217**	.062*	0.033	0.030	.085**	1			
15 Founding Year	-0.007	0.002	0.039	-0.037	-0.033	0.011	0.010	-0.042	-.176**	-0.049	-0.048	-0.022	-.088**	-.495**	1		
16 Revenue in mio € (2018)	-0.014	-0.004	-0.017	0.053	.105**	-0.004	-0.061	0.015	.246**	.110**	0.058	.078*	.114**	.903**	-.433**	1	
17 Kununu Score (Below/ Above Average)	.313**	.294**	.179**	.305**	.360**	.276**	.245**	.343**	.415**	.367**	.336**	.328**	.429**	.158**	-.098**	.202**	1

**: Correlation is significant at the 0.01 level (2-tailed).

*: Correlation is significant at the 0.05 level (2-tailed).

7.2. Comparative testing

7.2.1. Mann-Whitney-U test

A Mann-Whitney-U test was calculated to determine if there were differences in the evaluation of job attributes between IT people in IT companies and non-IT companies. Because the data is not normally distributed and the variables are ordinally scaled, a non-parametric test was chosen for this comparison instead of the t-test. The distributions differed between both groups, Kolmogorov-Smirnov $p < .05$ (see appendix 6). There was a statistically significant difference between both groups regarding *interesting tasks* ($U = 151174.00$, $Z = -2.88$, $p = .004$, $r = .08$), *compensation and social benefits* ($U = 129107.00$, $Z = -6.88$, $p < .001$, $r = .20$), *working conditions* ($U = 154428.50$, $Z = -2.24$, $p = .025$, $r = .06$) and *image* ($U = 155658.00$, $Z = -2.00$, $p = .045$, $r = .06$). The value of the mean rankings in those four categories all indicate a higher satisfaction with IT people in non-IT companies than in IT companies (see appendix 7). The effect sizes of the detected differences are small for all four categories, $r < 0.3$ (Hemmerich 2019).

Interpretation

A possible explanation for the better evaluation of the categories *image* and *compensation and social benefits* in non-IT firms could be that more big companies with well-known brands were included in the non-IT sample. This is due to the fact that bigger non-IT companies have more reviews by IT-professionals than smaller, less known companies, who often outsource their IT-department. The non-IT firms included in the sample generate an average revenue of EUR 55,663 million in 2018 (vs. EUR 20,473 million average revenue for IT firms) and employ an average of 184,765 people in 2018 (vs. 57,959 employees on average in IT-firms), which confirms that the companies in the non-IT group are bigger. In addition, the correlation calculation (see table 1) also confirms that the higher the number of employees and the revenue of a company, the better the categories compensation and social benefits as well as image are evaluated.

The higher satisfaction with *compensation and social benefits* in non-IT firms could be explained on the grounds of the assumption that larger companies with higher annual revenue are able to pay higher salaries and offer more social benefits. In addition, the majority of the companies in the top ten of most attractive employers for IT professionals (Universum Global 2018) are non-IT companies such as four automotive companies (also included in the study),

which also suggests that non-IT companies' images might be more favourably perceived by IT-professionals in Germany.

That the categories *interesting tasks* and *working conditions* are better regarded among IT professionals in non-IT companies seems surprising at first. The results of the Mann-Whitney-U-test contradict the hypotheses *H3b* and *H3c* indicating the opposite effect. Typically, one would assume that IT firms – whose core business is IT – have ambitious, diverse, challenging and innovative tasks for their IT employees and therefore provide them with state-of-the-art technology and equipment. Perhaps it is this perception that creates high expectations among IT professionals when joining an IT company. High expectations can turn into disappointment when they are not met in work reality. On the other hand, IT employees might expect less when deciding to work for a non-IT company in terms of tasks and working conditions, who then turn out to be more satisfied with what they find. However, it needs to be stated that IT professionals of both groups are fairly satisfied with job attribute regarding the *interesting tasks* ($m(IT) = 3.75$; $m(non-IT) = 4.0$) and *working conditions* ($m(IT) = 3.62$; $m(non-IT) = 3.83$).

7.2.2. Split sample comparison

When splitting the sample into companies scoring above and below the Kununu average (3.38 stars for all companies and 3.77 stars for the IT sector, respectively) and running the Mann-Whitney-U test on both sample groups the following results were found: in companies rated below average the difference in evaluation between IT professionals in IT and non-IT companies is very clear. All job facets, except *colleague relationship*, have significantly smaller mean ranks in IT firms than in non-IT firms, indicating lower levels of satisfaction in IT companies. The difference in evaluation of the category *colleague relationship* is found to be non-significant (see table 2).

Concerning the sample group of overall well rated companies (above Kununu average) the results are more diverse. The evaluation of *work atmosphere* (*H2a*), *superiors' behaviour*, *colleague relationship* (*H2b*), *communication* (*H2c*), *equality* (*H4a*), *treatment of senior colleagues* (*H4b*), *compensation and social benefits* as well as *career and further education* (*H3b*) differs significantly in IT and non-IT companies. Contrary to the results testing the full sample, IT workers in IT companies are more satisfied with said job facets in above average rated IT companies. Only the category compensation and social benefits resulted in the opposite

effect: IT professionals evaluated this facet better in above average rated non-IT companies than their colleagues in IT companies rated above average (see table 2).

Table 2: Mann-Whitney-U test on split sample

Kununu Score	Evaluation Category	Group	N	Mean Rank	Sum of	Mann-Whitney-U	Z	Sig. (2-tailed)	p
below average	Work Atmosphere	Non-IT	245	271.93	66623.50	24271.50	-3.96	.000	***
		IT	248	222.37	55147.50				
	Superiors' Behaviour	Non-IT	245	269.62	66056.00	24839.00	-3.60	.000	***
		IT	248	224.66	55715.00				
	Colleague Relationship	Non-IT	245	258.84	63416.50	27478.50	-1.93	.054	n.s.
		IT	248	235.30	58354.50				
	Interesting Tasks	Non-IT	245	277.71	68039.50	22855.50	-4.89	.000	***
		IT	248	216.66	53731.50				
	Communication	Non-IT	245	273.52	67012.50	23882.50	-4.21	.000	***
		IT	248	220.80	54758.50				
	Equality	Non-IT	245	264.80	64877.00	26018.00	-2.86	.004	*
		IT	248	229.41	56894.00				
	Treatment of Senior Colleagues	Non-IT	245	272.92	66866.50	24028.50	-4.18	.000	***
		IT	248	221.39	54904.50				
	Career / Further Education	Non-IT	245	282.22	69145.00	21750.00	-5.60	.000	***
		IT	248	212.20	52626.00				
	Compensation / Social Benefits	Non-IT	245	288.35	70646.50	20248.50	-6.57	.000	***
		IT	248	206.15	51124.50				
	Working Conditions	Non-IT	245	268.73	65838.00	25057.00	-3.44	.001	***
		IT	248	225.54	55933.00				
	Environmental- / Social Awareness	Non-IT	245	263.47	64551.00	26344.00	-2.61	.009	**
		IT	248	230.73	57220.00				
	Work-Life-Balance	Non-IT	245	260.51	63825.50	27069.50	-2.14	.032	*
		IT	248	233.65	57945.50				
	Image	Non-IT	245	272.80	66837.00	24058.00	-4.09	.000	***
		IT	248	221.51	54934.00				
above average	Work Atmosphere	Non-IT	350	308.10	107836.00	46411.00	-3.63	.000	***
		IT	312	357.75	111617.00				
	Superiors' Behaviour	Non-IT	350	312.38	109332.50	47907.50	-2.90	.004	*
		IT	312	352.95	110120.50				
	Colleague Relationship	Non-IT	350	311.98	109191.50	47766.50	-3.09	.002	*
		IT	312	353.40	110261.50				
	Interesting Tasks	Non-IT	350	323.42	113197.50	51772.50	-1.27	.203	n.s.
		IT	312	340.56	106255.50				
	Communication	Non-IT	350	318.33	111415.50	49990.50	-1.97	.049	*
		IT	312	346.27	108037.50				

Kununu Score	Evaluation Category	Group	N	Mean Rank	Sum of	Mann-Whitney-U	Z	Sig. (2-tailed)	p
above average	Equality	Non-IT	350	305.03	106759.00	45334.00	-4.25	.000	***
		IT	312	361.20	112694.00				
	Treatment of Senior Colleagues	Non-IT	350	312.08	109228.00	47803.00	-3.12	.002	**
		IT	312	353.29	110225.00				
	Career / Further Education	Non-IT	350	308.49	107972.00	46547.00	-3.47	.001	***
		IT	312	357.31	111481.00				
	Compensation / Social Benefits	Non-IT	350	355.31	124358.50	46266.50	-3.66	.000	***
		IT	312	304.79	95094.50				
	Working Conditions	Non-IT	350	328.49	114971.50	53546.50	-0.46	.644	n.s.
		IT	312	334.88	104481.50				
	Environmental- / Social Awareness	Non-IT	350	319.32	111763.00	50338.00	-1.86	.063	n.s.
		IT	312	345.16	107690.00				
	Work-Life-Balance	Non-IT	350	333.67	116784.50	53840.50	-0.33	.740	n.s.
		IT	312	329.07	102668.50				
	Image	Non-IT	350	322.93	113027.00	51602.00	-1.31	.189	n.s.
		IT	312	341.11	106426.00				

n.s.: $p > .05$, *: $p < .05$, **: $p < .01$, ***: $p < .001$

Interpretation

The analysis of the Mann-Whitney-U test of the full sample suggests that IT professionals working in IT companies are less satisfied with certain job facets (*interesting tasks, working conditions, compensation and social benefits, image*) than the ones working in non-IT companies; no significant difference between IT and non-IT companies concerning the evaluation of the remaining job attributes was determined. Based on these results hypotheses *H3b* and *H3c* concerning the evaluation of *working conditions* and *interesting tasks* have to be rejected. Furthermore, the results imply a lower job facet satisfaction in IT companies than non-IT companies, which stands in contrast to the assumption in *H1*.

The subdivision into well rated and low rated companies allowed for a more detailed insight. With low rated companies, the previously observed tendency is evident: in twelve out of thirteen job categories IT professionals working in IT companies express significantly lower levels of satisfaction than in non-IT companies. However, in companies rated above average the tendency is reversed. Seven categories are assessed significantly better by IT professionals in IT companies than the ones working in non-IT companies.

Among those categories *work atmosphere*, *colleague relationship* and *communication* are job aspects that highly depend on the people that work in the company, their personalities, communication skills and how well they get along with each other. It appears plausible that in high rated IT companies, where IT professionals usually make up the majority of the staff, job facets that relate to the interpersonal context of the workplace are rated better than in non-IT companies. The results hereby confirm the hypotheses concerning social interaction at work *H2a*, *H2b* and *H2c* at least in the sample group of companies rated above average. However, if having a large proportion of like-minded IT colleagues is the reason for higher satisfaction levels in those categories, the same effect should be expected to be found in lower rated IT companies. Surprisingly, the results of testing below average rated companies clearly contradict this assumption, as non-IT companies score higher among IT professionals in virtually all categories including the ones referring to the interpersonal dealings at the workplace.

Surprisingly, the categories *equality* and *treatment of senior colleagues* also turned out to be positive satisfaction drivers for IT people in high rated IT companies. These results contradict hypotheses *H4a* and *H4b* where based on the notion that the IT crowd is largely male and generally younger compared to other occupational groups, a better assessment of said categories was expected in non-IT companies with a presumably more diverse staff. It may however be, that well-regarded IT companies take particular care to address the issues concerning the lack of age and gender diversity and are therefore assessed positively.

Superiors' behaviour and *career and further education* are the other two job facets that were praised by IT professionals working IT companies rated above average. Hypothesis *H3a* regarding *career and further education* can therefore be confirmed regarding the sample group rated above average. IT companies' business success highly depends on the knowledge, work and effort of well-trained and capable IT professionals. It therefore seems reasonable that IT companies attach special importance to the promotion, further training and support of skilled IT employees. This argumentation however does not hold true among IT companies rated below average, where those job aspects were rated significantly worse than in non-IT companies.

Although IT professionals seem to be generally more satisfied with non-IT employers as evidenced by the t-test, the Mann-Whitney-U test of the full sample and of lower than Kununu average rated companies, there are six job aspects – mostly concerning the social interaction in working life – that are positive contributors to the employee satisfaction in IT firms.

Compensation and social benefits is the only job aspect where non-IT firms unequivocally score better among IT employees, irrespective of how well the employer is rated overall. It certainly

seems that non-IT companies are better at meeting IT professionals' expectations in regards to financial and non-financial remuneration. However, it is important to note that in the sample the group of non-IT companies generated larger revenues and had more employees than the group of IT companies, supporting the assumption that bigger companies might be able to provide their IT-personnel with better *compensation and social benefits*. A recent study by weekly journal Computerwoche in partnership with Compensation Partner compared salaries in information technology. One of the findings shows that a company's size indeed influences the salary level: the bigger the company, the higher the salary. This is in part due to the fact that big corporations are bound to collective agreements forcing them to pay a certain salary level (Königes 2019). The composition of the sample in combination with the presumption that the non-IT companies offer their IT employees higher *compensation and more social benefits* due to their size might lead to the higher satisfaction level with said category among IT professionals.

7.3. Multiple linear regression analyses

7.3.1. Average satisfaction in IT and non-IT companies

The next statistical test performed to answer hypothesis *H1* posed in this thesis is a multiple linear regression. The analysis will give information as to whether and how the fact that a company operates in an IT or non-IT sector influences the overall employee satisfaction of IT professionals working there. To test this hypothesis the regression model is set as follows: how satisfied IT-employers are with their job and employer expressed by the average evaluation score of all reviews in the sample will be the dependent variable in the model. The predictors that might influence the outcome (employee satisfaction) are job- and firm-related. The job-related variables introduced into the model are job position (employee = 0, management position = 1) and job status (former = 0, current = 1). The firm-related variables include the size of the company by number of employees worldwide in 2018 and the revenue generated in 2018 in Euro as well as the company's founding year. Most important, however, is the predictor specifying whether the company is a non-IT firm (0) or if it is part of the IT sector (1).

The linear regression has several underlying assumptions that have to be fulfilled in order for the model to be valid and unbiased (Field 2018; Hemmerich 2019). First and most essential is the prerequisite of a linear relationship between the outcome variable and the combined effect of the predictors. By visual inspection of the scatterplot of studentized residuals against unstandardized predicted values, a clear negative linear trend is identified (see appendix 8A).

Partial regression plots showing the relationship between the outcome variable and the individual predictor further confirm linearity. The absence of potential outliers distorting the regression was ensured, by checking the studentized excluded residuals. None of the values are outside the -3 to +3 span, which allows the assumption that the data does not contain outliers. This assumption is additionally supported by the assessment of Cook's distances: the largest value in the data is 0.017 and thus far off the critical value of 1. As this analysis is based on cross-sectional data without a time dimension a test for autocorrelation of residuals is not of particular importance and can therefore be neglected (Field 2018). The next step is to examine if variance stays constant at each level of the predictor variables. The scatter diagram plotting the studentized residuals against the unstandardized predicted values shows that each level of the predictor variable has the same variance (see appendix 8A). Therefore, the model is considered to be homoscedastic. Multicollinearity could be ruled out since none of Pearson's correlation coefficients indicating the strength of the correlation in between predictors are above the critical value of 0.7. Looking at the collinearity statistics, the tolerance values above 0.1 and VIFs below 10 further evidence that no multicollinearity exists (see appendix 8B). The last step is to check for the normality of errors, which can be assessed by inspecting the histogram of residuals and the normal probability plot (appendix 8C). The distribution seems roughly normal, resembling the typical bell-shape of normal distribution although with an excess of residuals between 0 and 1. The probability plot indicates slight deviations from normality as well. However, the multiple linear regression is usually sufficiently robust even if the assumption of normality of residuals is violated (Hemmerich 2019).

All predictors were integrated into the model by method of forced entry. Table 3 shows the results of the multiple linear regression. The R^2 of the model indicates that the predictors explain 16 percent of variance of IT professionals' job satisfaction. The rather small percentage is not surprising, considering that only firm- and job-related aspects were included in the model. Personal details such as gender, age, employee tenure, family status, health, educational background etc. may have a lot of influence on how satisfied an IT professional is as an employee. Unfortunately, these data were not part of Kununu's question profile and could therefore not be collected and included to improve the model. In light of the lack of other potentially significant predictors, the fit of the model is decent at this point (adjusted $R^2 = 0.155$). Looking at the model summary all predictors inserted were able to predict the job satisfaction of IT employees in a statistically significant manner, $F(6, 1025) = 32.48, p < .001$.

Table 3: Multiple linear regression determining predictors' influence on IT professionals' job satisfaction

Model Summary^b

Model	R	R-Square	Adjusted R-Square	Std. Error of the Estimate
1	0.400 ^a	0.160	0.155	1.011

a. Predictors: (Constant), Job Position, Job Status, Employee Number in k (2018), Founding Year, IT/ Non-IT, Revenue in bn € (2018)

b. Dependent Variable: Average Satisfaction

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	199.154	6	33.192	32.481	.000 ^b
	Residuals	1047.452	1025	1.022		
	Total	1246.606	1031			

a. Dependent Variable: Average Satisfaction

b. Predictors: (Constant), Job Position, Job Status, Employee Number in k (2018), Founding Year, IT/ Non-IT, Revenue in bn € (2018)

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficient	T	Sig.		95% Confidence Interval for B	
		Regression Coefficient B	Std. Error	Beta		p		Lower Bound	Upper Bound
1	(Constant)	3.209	1.502		2.137	.033	n.s.	0.262	6.156
	IT/ Non-IT	0.010	0.076	0.005	0.005	.890	n.s.	-0.139	0.160
	Job Status	1.195	0.098	0.351	12.166	.000	***	1.002	1.388
	Job Position	0.305	0.078	0.112	3.887	.000	***	0.151	0.458
	Employee Number in k (2018)	-0.001	0.000	-0.135	-3.371	.001	**	-0.002	0.000
	Founding Year	0.000	0.001	-0.013	-0.390	.697	n.s.	-0.002	0.001
	Revenue in bn € (2018)	0.004	0.001	0.165	4.097	.000	***	0.002	0.006

a. Dependent Variable: Average Satisfaction

n.s.: $p > .05$, *: $p < .05$, **: $p < .01$, ***: $p < .001$

A closer inspection of the individual predictors and their coefficients reveals that not all variables significantly influence the outcome of job satisfaction. The company's founding year and most notably whether the employer operates in the IT or non-IT industry sector have no influence on how well IT professionals evaluate their employer. Job status has the largest influence on IT professionals' satisfaction, $T(1025) = 12.17$, $p < .001$. When an IT employee evaluates the company that they are currently working at, their overall satisfaction is increased by 1.20 stars, provided that all other predictors are held constant. The job position also significantly affects the outcome of how satisfied IT people are with their employment, $T(1025) = 3.89$, $p < .001$. IT professionals that hold a management position are significantly more satisfied than simple IT employees as their satisfaction rate increases by 0.31 units, if all other predictors are held constant. Furthermore, the revenue that a company generated in the year 2018 exerts a significant influence on how well IT professionals rate their employer, $T(1025) = 4.10$, $p < .001$. A unit increment in revenue raises IT professionals' overall satisfaction level by 0.004 stars. Lastly, a company's number of employees is significantly affecting how well IT professionals rate their employer, $T(1025) = -3.37$, $p < .01$. With a rise in number of employees by a thousand, IT professionals average employee satisfaction decreases by 0.001 stars, provided all other predictors are held constant.

A second linear regression was run including only the four significant predictors. The $R^2 = 0.160$ however remains the same as in the previous model and the adjusted $R^2 = 0.156$ indicates only a very small improvement of the model by the exclusion of the non-significant variables.

The hypothesis *H1* that IT professionals feel more satisfied working in IT companies than in non-IT companies has to be dismissed on the basis of the results of this multiple linear regression. This means that the linear regression model provides no evidence of a better person-organization-fit between IT employees and IT-firms. However, the model also gives no evidence of the opposite effect. Even though the regression coefficient ($B = 0.010$) indicates that satisfaction increases when an IT professional works in an IT company, the overall influence of this predictor remains non-significant.

7.3.2. Individual job facet satisfaction in IT and non-IT companies

Even though working in an IT or non-IT company has no significant impact on IT professionals' average satisfaction as evidenced by the previous chapter, IT professionals' job satisfaction could still differ regarding specific aspects of an employment. To further test hypotheses *H2-H4* the multiple linear regression is repeated with each of the thirteen evaluation categories as the dependent variable. All requirements for the multiple linear regression mentioned in the previous test were checked and verified equally for each of the following regressions. The six predictors (IT/non-IT, job status, job position, employee number in 2018, revenue of 2018 and the founding year) were integrated in each model by method of forced entry. All thirteen regression models are significant, $p < .001$. The six predictors explain 7.1 percent of IT professionals' satisfaction variance in the category *colleague relationship*, 9.3 percent of *treatment of senior colleagues'* satisfaction variance, 9.5 percent of *work-life-balance*, 10.1 percent of *equality*, 10.4 percent of *environmental and social awareness*, 11.7 percent of *working conditions*, 12.5 percent of *work atmosphere'* satisfaction variance, 13.8 percent of *superiors' behaviour*, 13.8 percent of *communication*, 13.9 percent of *image*, 14.3 percent of *interesting tasks*, 14.6 percent of *career and further education* and 15.6 percent in the category *compensation and social benefits*, as indicated by the R^2 of each model. As mentioned in the previous chapter, personal and other job-related factors that are potentially contributing to IT professionals' job satisfaction were not available for this study, so the fit of the model is viewed as adequate within this framework. It is however notable that six predictors used in this model explain the satisfaction variance of some job facets better than of others. The firm- and job-related variables used for these models are apparently less suitable to predict IT professionals' satisfaction with *colleague relationship* than their satisfaction with *compensation and social benefits*. The results are summarised in table 4 listing the predictors' regression coefficient B and significance of each of the thirteen regressions.

Table 4: Overview of multiple linear regressions to determine individual job facet satisfaction

	IT / Non-IT		Job Status		Job Position		Number of Employees in k (2018)		Founding Year		Revenue in bn € (2018)	
	Regression Coefficient B	Sig	Regression Coefficient B	Sig	Regression Coefficient B	Sig	Regression Coefficient B	Sig	Regression Coefficient B	Sig	Regression Coefficient B	Sig
Work Atmosphere	-0.008	0.932 n.s.	1.307	0.000 ***	0.286	0.002 **	-0.001	0.004 **	0.000E+00	0.969 n.s.	0.003	0.016 *
Superiors' Behaviour	0.017	0.871 n.s.	1.586	0.000 ***	0.330	0.002 **	-0.001	0.099 n.s.	0.001	0.602 n.s.	0.002	0.102 n.s.
Colleague Relationship	0.102	0.210 n.s.	0.857	0.000 ***	0.175	0.036 *	-0.001	0.085 n.s.	0.000	0.508 n.s.	0.002	0.131 n.s.
Interesting Tasks	-0.070	0.442 n.s.	1.236	0.000 ***	0.510	0.000 ***	-0.001	0.001 **	0.000	0.835 n.s.	0.004	0.001 **
Communication Equality	0.082	0.371 n.s.	1.317	0.000 ***	0.333	0.000 ***	-0.001	0.013 *	0.000	0.708 n.s.	0.006	0.000 ***
	0.088	0.323 n.s.	1.112	0.000 ***	0.188	0.041 *	-0.001	0.001 **	0.000	0.593 n.s.	0.004	0.001 **
Treatment of Senior Colleagues	-0.192	0.035 *	1.008	0.000 ***	0.302	0.001 **	-0.001	0.001 **	0.001	0.575 n.s.	0.001	0.490 n.s.
Career / Further Education	0.023	0.818 n.s.	1.325	0.000 ***	0.585	0.000 ***	-0.002	0.000 ***	0.000	0.775 n.s.	0.006	0.000 ***
Compensation / Social Benefits	-0.089	0.318 n.s.	1.035	0.000 ***	0.373	0.000 ***	-0.001	0.001 **	-0.002	0.033 *	0.008	0.000 ***
Working Conditions	0.035	0.701 n.s.	1.155	0.000 ***	0.238	0.012 *	-0.001	0.006 **	-0.001	0.684 n.s.	0.006	0.000 ***
Environmental- / Social Awareness	0.054	0.562 n.s.	1.185	0.000 ***	0.274	0.004 **	-0.001	0.077 n.s.	0.000	0.784 n.s.	0.003	0.012 *
Work-Life- Balance	-0.018	0.852 n.s.	1.142	0.000 ***	0.049	0.620 n.s.	-0.001	0.042 *	0.000	0.651 n.s.	0.004	0.001 **
Image	0.111	0.232 n.s.	1.271	0.000 ***	0.315	0.001 **	-0.001	0.005 **	-0.002	0.101 n.s.	0.007	0.000 ***
Average Satisfaction	0.010	0.890 n.s.	1.195	0.000 ***	0.305	0.000 ***	-0.001	0.001 **	0.000	0.697 n.s.	0.004	0.000 ***

n.s.: p > .05, *: p < .05, **: p < .01, ***: p < .001

Consistent with the finding in the previous chapter, the regressions of each individual job facet further confirm that whether a company is affiliated with the IT or a non-IT industry has no significant influence on IT professionals' employer satisfaction. The influence of the employers' industry sector was found to be non-significant on IT professionals' satisfaction levels in twelve out of thirteen job facets. Therefore, hypotheses *H2a-c*, *H3a-c* and *H4a* have to be dismissed since no significant difference in evaluation of the respective job facets was found. Only the assessment of *treatment of senior colleagues* seems to be impacted significantly; $T(1025) = -2.112$, $p < .05$. IT employees' satisfaction level concerning *treatment of senior colleagues* decreases by 0.192 stars, when they are working in IT companies versus working in non-IT companies.

Interpretation

Whereas in the Mann-Whitney-U-test of the split sample *treatment of senior colleagues* turned out to be assessed more favourably among IT personnel in IT companies rated above average than in non-IT companies of the same group, the multiple linear regression indicates the opposite effect and thereby supports hypothesis *H4b*. As evidenced by the report of the German Federal Agency for employment IT personnel is a notably younger crowd than other professional groups with 9 out of 10 IT employees being under the age of 55. Furthermore, older IT professionals have greater difficulties on the labour market as the unemployment rate for IT workers in the age group 55 to 64 stood at 4 percent in 2018 and was thus almost double the rate of younger colleagues (Statistik der Bundesagentur für Arbeit 2019). In an interview with the platform XING IT recruiter Yeshe Sherpa also reported, that it is much harder to place IT professionals over 50, because they often lack the newest technological skills wanted (Miller 2018). Presumably, IT companies whose core business is the development of technology might be in greater need of the up-to-date skills that younger IT professionals tend to have. In fact, age discrimination can also be observed in tech-Mecca Silicon Valley where the median employee age at tech-giants such as Google, Facebook, Apple and Amazon is no older than 31 (Pelisson and Hartmans 2017). This lack of age inclusivity might be a reason as to why working in an IT company influences IT professionals' satisfaction with *treatment of senior colleagues* negatively.

Looking at the other predictors, the results concerning individual job facets mostly correspond the findings of the multiple regression determining the predictors' influence on the overall job satisfaction. Current IT employees express higher satisfaction in all thirteen evaluation categories than former IT employees. IT professionals in management positions are more

satisfied with almost all job facets than simple IT employees except for *work-life-balance*, where the influence of the job position was found to be non-significant. IT professionals' evaluation of *superiors' behaviour*, *colleague relationship* and *environmental and social awareness* is unaffected by the number of employees in the company, whereas the other ten job facets show decreasing satisfaction levels, the more people work in a company. A company's age has no significant impact on IT professionals' assessment of the individual job facets except for *compensation and benefits* where the satisfaction level decreases by 0.002 stars per year the younger the company is. Lastly, the regressions determined that the companies' revenue of 2018 influences IT employees' satisfaction positively in ten out thirteen categories evaluated. Interestingly, the assessment of job facets regarding the social context of an employment such as *superiors' behaviour*, *colleague relationship* and *treatment of senior colleagues* are not significantly impacted by the amount of revenue generated by the employing company. This finding signals that IT professionals' perception of interpersonal aspects at work is detached from their employers' financial success and is therefore assessed more independently than other job facets.

7.3.3. Multiple linear regression on split sample

The multiple linear regressions with the average satisfaction and each job facet satisfaction as the dependent variable are repeated on a split sample. The sample is divided into companies that were graded above the Kununu average or below the Kununu average (3.38 stars for all companies and 3.77 stars for the IT sector, respectively). Testing all thirteen categories and the average satisfaction in both sample groups resulted in a total of 28 regression models. All models are significant, $p < .001$. The requirements for a multiple linear regression checked in the previous chapters apply equally to the following models.

Since this thesis aims to identify differences of IT employees' job satisfaction depending on whether they work in an IT or non-IT company, the following analysis will mainly focus on the results concerning the predictor non-IT/ IT. Nonetheless, the other predictors (job position, job status, employee number, founding year and revenue) are included in the tables 5 and 6 as all six predictors were integrated into the model simultaneously by method of forced entry.

Table 5: Multiple linear regression with companies rated below average

	IT / Non-IT		Job Position		Job Status		Employee Number in k (2018)		Founding Year		Revenue in bn € (2018)	
	B	Sig	B	Sig	B	Sig	B	Sig	B	Sig	B	Sig
Work Atmosphere	-0.691	***	0.461	**	0.844	***	0.000	n.s.	-0.001	n.s.	-0.004	n.s.
Superiors' Behaviour	-0.568	**	0.569	**	1.106	***	0.000	n.s.	0.000	n.s.	-0.001	n.s.
Colleague Relationship	-0.289	*	0.348	*	0.524	**	-6.663E-05	n.s.	0.001	n.s.	0.000	n.s.
Interesting Tasks	-0.600	***	0.794	***	0.837	***	0.000	n.s.	0.001	n.s.	0.002	n.s.
Communication	-0.533	***	0.521	**	0.732	***	0.000	n.s.	0.000	n.s.	0.000	n.s.
Equality	-0.483	**	0.522	**	0.801	***	0.000	n.s.	-0.003	n.s.	0.001	n.s.
Treatment of Senior Colleagues	-0.729	***	0.591	**	0.603	**	0.001	n.s.	-0.002	n.s.	-0.008	n.s.
Career / Further Education	-0.740	***	0.904	***	0.811	***	4.317E-05	n.s.	-0.003	n.s.	-0.003	n.s.
Compensation / Social Benefits	-0.681	***	0.675	***	0.661	***	0.000	n.s.	0.001	n.s.	0.001	n.s.
Working Conditions	-0.543	***	0.413	*	0.677	***	0.001	n.s.	0.000	n.s.	-0.002	n.s.
Environmental- / Social Awareness	-0.504	**	0.547	**	0.594	**	0.001	n.s.	0.001	n.s.	-0.001	n.s.
Work-Life-Balance	-0.506	**	0.173	n.s.	0.590	**	0.000	n.s.	-0.001	n.s.	0.003	n.s.
Image	-0.547	***	0.643	***	0.800	***	0.002	n.s.	-0.005	n.s.	-0.014	n.s.
Average Satisfaction	-0.570	***	0.551	***	0.737	***	0.000	n.s.	-0.001	n.s.	-0.002	n.s.

n.s.: $p > .05$, *: $p < .05$, **: $p < .01$, ***: $p < .001$

Considering the results of the sample group graded below the Kununu average it stands out that the employers' industry sector (IT or non-IT) significantly influences IT employees' satisfaction level in all thirteen job aspects as well as their overall average satisfaction. The negative B coefficients in all fourteen regressions indicate that job facet satisfaction decreases when the IT employee works in an IT company rated below average compared to those who work in non-IT companies rated below average. At least regarding IT professionals working in lower than average rated companies, hypothesis *H1* claiming that IT employees working in IT companies are generally more satisfied than the ones working in non-IT companies is clearly contradicted. This insight also applies for hypotheses *H2a-c* and *H3a-c* suspecting higher satisfaction levels of IT employees in IT firms with the job aspects *work atmosphere*, *colleague*

relationship and communication as well as career and further education, working conditions and interesting tasks. Quite the opposite seems to hold true for IT professionals employed in companies ranking below the Kununu average as working in IT companies (versus non-IT companies) influenced their satisfaction levels with these six job aspects negatively. Only hypotheses *H4a* and *H4b* can be confirmed within the sample group of employers rated below average: IT professionals working in non-IT firms indeed indicate higher satisfaction levels with *equality and treatment of senior colleagues*.

Table 6: Multiple linear regression with companies rated above average

	IT / Non-IT		Job Position		Job Status		Employee Number in k (2018)		Founding Year		Revenue in bn € (2018)	
	B	Sig	B	Sig	B	Sig	B	Sig	B	Sig	B	Sig
Work Atmosphere	0.309	*	0.196	*	1.164	***	0.000	n.s.	0.000	n.s.	-0.001	n.s.
Superiors' Behaviour	0.223	n.s.	0.209	n.s.	1.527	***	0.001	n.s.	0.001	n.s.	-0.002	n.s.
Colleague Relationship	0.339	**	0.084	n.s.	0.903	***	0.000	n.s.	0.000	n.s.	0.000	n.s.
Interesting Tasks	0.202	n.s.	0.362	***	1.132	***	0.000	n.s.	-0.001	n.s.	0.002	n.s.
Communication	0.263	n.s.	0.244	**	1.359	***	0.000	n.s.	0.001	n.s.	0.002	n.s.
Equality	0.241	n.s.	-0.007	n.s.	0.850	***	0.001	n.s.	0.001	n.s.	-0.001	n.s.
Treatment of Senior Colleagues	-0.080	n.s.	0.145	n.s.	0.827	***	-8.773E-05	n.s.	0.002	n.s.	-0.003	n.s.
Career / Further Education	0.333	*	0.407	*	1.128	***	-0.001	n.s.	2.237E-05	n.s.	0.002	n.s.
Compensation / Social Benefits	0.318	*	0.220	*	0.763	***	-0.001	n.s.	-0.005	***	0.007	***
Working Conditions	0.254	n.s.	0.162	n.s.	1.008	***	-0.001	n.s.	-0.002	n.s.	0.003	*
Environmental- / Social Awareness	0.185	n.s.	0.143	n.s.	1.220	***	0.000	n.s.	-0.001	n.s.	0.000	n.s.
Work-Life-Balance	-0.174	n.s.	0.006	n.s.	1.096	***	-0.001	n.s.	0.000	n.s.	-0.001	n.s.
Image	0.437	**	0.137	n.s.	1.025	***	-7.032E-05	n.s.	-0.002	n.s.	0.003	*
Average Satisfaction	0.219	*	0.178	*	1.077	***	-8.280E-05	n.s.	0.000	n.s.	0.001	n.s.

n.s.: $p > .05$, *: $p < .05$, **: $p < .01$, ***: $p < .001$

Surprisingly, the analysis of the sample group including only companies rated above the Kununu average paints a very different picture. Whether the employer is an IT or non-IT company was found to be a non-significant influence on IT employees' satisfaction with *superiors' behaviour, interesting tasks (H3c), communication (H2c), equality (H4a), treatment of senior colleagues (H4b), working conditions (H3b), environmental and social awareness and work-life-balance*. However, in regards to the categories *work atmosphere (H2a), colleague relationship (H2b), career and further education (H3a), compensation and social benefits, image* as well as the average satisfaction (*H1*) results are contrasting findings from the sample group of companies rated below average. The positive B coefficients demonstrate that working in IT companies rated above average raises IT employees' satisfaction levels with these five job aspects and their satisfaction overall, compared to those working in non-IT companies. Therefore, hypotheses *H1, H2a, H2b* and *H3a* can be confirmed within this sample group.

Interpretation

Inspecting the multiple linear regressions on the split sample has revealed similar tendencies to those found with the Mann-Whitney-U test on the split sample. IT employees who work in companies ranking below the Kununu average show higher satisfaction levels with non-IT employers than with IT-employers. Both tests show that IT professionals assess almost all job attributes better in non-IT companies than in IT companies of the below average sample group. Additionally, the multiple linear regression evidences that working in IT companies rated below average negatively influences IT professionals' overall average satisfaction significantly. This finding opposes the thesis' main assumption *H1*.

With the sample group consisting of companies rated above the Kununu average the tendency is reversed. In fact, average satisfaction among IT professionals working in companies rated above average is increased in IT companies compared to non-IT companies. This result is also reflected when looking at the individual job facets: IT professionals' satisfaction is significantly increased in five job aspects when the employer is an IT company rated above average compared to a non-IT company of the same group. As seen with the Mann-Whitney-U test as well, the job aspects *work atmosphere, colleague relationship* and *career and further education* are assessed more favourably among IT professionals in IT firms, thereby supporting hypotheses *H2a, H2b* and *H3a*. In these categories IT professionals assess personal interaction at the workplace as well as how supported and encouraged they feel professionally. Since well regarded IT companies seem to fulfil IT employees' expectations better in the areas mentioned than non-IT companies, these three job attributes can be seen as positive drivers of IT employee

satisfaction. Remarkably, *image* and *compensation and social benefits* also turned out as positive driving factors of IT employee satisfaction in IT companies. This contradicts findings from the Mann-Whitney-U test of the full sample, where both job attributes were shown to be assessed significantly better among IT employees in non-IT firms than the ones working in IT companies.

A possible explanation for the disparity in results between the sample groups could be that IT employees have higher expectations towards employers operating in their industry. Well performing IT companies may be able to better meet those expectations, especially in terms of interpersonal dealings at the workplace, professional advancement but seemingly also in terms of remuneration and employer branding. Then again, when those high expectations are not met, as in the case of badly rated IT companies, non-IT companies are perceived as the more satisfactory employers.

Additionally, it must be noted that proportionately more IT employees work in IT firms compared to the quota of IT people in non-IT firms. For example at SAP, which is the market leader in enterprise application software based in Germany, 28 percent of employees work IT jobs in the area of “research and development” and another 16.5 percent in the area of “cloud and software” (Tenzer 2019). Each company’s Kununu score, on which basis the distinction between companies rated above average and below average is made, is calculated from reviews of all professions including IT professionals. Since IT employees are dominant in an IT company their satisfaction or dissatisfaction strongly determines whether the employer is performing well or badly on the platform, whereas in non-IT companies many other occupational groups affect an employers’ overall rating. Keeping this in mind it seems consequential that on one hand IT employees are especially dissatisfied in IT companies of the badly rated sample group and on the other hand particularly satisfied in IT companies of the well rated sample group. However, this interpretation presupposes that all other non-IT occupational groups assess their employers similarly or even contrary to IT professionals. Further research comparing reviews from IT and non-IT employees could provide insights into evaluation differences and similarities between occupational groups.

8. Discussion

After testing the sample data regarding IT professionals' employee satisfaction working in IT- and non-IT firms interesting new insights were gained. A general analysis of the data has revealed that regardless of the company's industry sector, IT professionals are fairly satisfied with their employers with evaluations averaging at 3.75 out of 5 stars. Among the individual job attributes assessed in the employer evaluation, *communication* receives the lowest assessment score which suggests that employers should pay particular attention to promote an open chain of communication with IT professionals. *Colleague relationship* on the other hand is most highly rated by IT employees, signalling that IT employees value professional and friendly interaction with colleagues.

Dividing the sample into groups of IT professionals working in IT firms and those working in non-IT firms has highlighted several differences in employee satisfaction. The t-test comparing the average evaluation scores between the two groups revealed that IT employees of non-IT firms are slightly more satisfied with their employers. Looking at the individual job attributes that were assessed, the comparative Mann-Whitney-U test showed that *interesting tasks*, *working conditions*, *compensation and social benefits* as well as *image* are better evaluated by IT people in non-IT firms than by those in IT firms. The test was repeated on the split sample: Among companies rated lower than average, non-IT companies are evaluated significantly better than IT companies in virtually all categories. However, among companies rated above average seven job facets perform significantly better in IT companies than in non-IT companies, thus emerging as positive drivers of employee satisfaction in IT companies. Only in regard to *compensation and social benefits* IT professionals prove once again to be more satisfied with non-IT companies.

The multiple linear regression allowed a comparison from a different perspective as it determined the influence of the employers' industry sector (IT or non-IT) along with five other predictors on IT professionals' employee satisfaction. The analysis revealed that whether the employer is an IT or non-IT company makes no significant difference to IT professionals' average employee satisfaction. Looking further at the individual job facets that IT professionals assessed, reinforced the notion: whether the employing company operates in the IT industry or not has no significant impact on IT employees' satisfaction with twelve out of thirteen job attributes. Only *treatment of senior colleagues* was deemed more satisfactory by IT employees in non-IT companies compared to those in IT companies. Splitting the sample in companies

performing above and below the Kununu average and repeating the linear regression analyses confirmed prior tendencies from the Mann-Whitney-U test: in companies ranking below the Kununu average, IT professionals are significantly more satisfied in non-IT companies in almost all categories. However, comparing companies above the Kununu average showed that IT companies were assessed significantly better in five categories.

Colleague relationship

Colleague relationship stands out as the job attribute graded best among all IT professionals in the sample. Additionally, among employers rated above the Kununu average, IT companies scored higher in the category *colleague relationship* than their non-IT competitors. These results tie in with findings from other studies concerning IT professionals' personality traits and IT culture. Researchers found higher levels of agreeableness in IT professionals compared to other occupational groups (Lounsbury et al. 2014). The image of the IT expert doing solitary work of programming is outdated as most work tasks today require IT professionals to work in teams with other IT colleagues, but frequently also across other departments. This explains the higher satisfaction with respect to teamwork and willingness to contribute to group efforts compared to other professional groups (Lounsbury et al. 2014). Based on the study of IT professionals' personality traits, it seems reasonable to suppose that IT employees appreciate friendly colleague relationships, which possibly might be enhanced in IT companies where the majority of the colleagues have the same professional background as well as similar values, interests and personalities. In fact, Jacks et al. (2018) found in their interviews with IT professionals that much of their enjoyment at the workplace comes from spending time with their IT colleagues. Interviewees for example mentioned that IT people share a certain sense of humour and often enjoy computer-related hobbies outside of work, which facilitate personal connections between colleagues. In their investigation of cultural factors influencing employees' evaluations of organizations in the US American IT sector two of the strongest positive influences identified by Schmiedel et al. (2016) were "great work environment" and "smart people". Both factors involve the importance of strong interpersonal relationships, a friendly atmosphere and supportive co-workers. Reviews associated with the factor "smart people" specifically praised working with intelligent, energetic people who have interesting new ideas. Employees mentioned their co-workers as a source of inspiration and motivation in their reviews. Another study examining employer attractiveness of IT companies on the basis of data collected from the employer rating platform Glassdoor (Dabirian et al. 2019) also found "social value", meaning the gratification IT employees gain from a collaborative work

environment and smart colleagues, to be an important factor of praise both among current and former employees.

Communication

Communication was the category rated the lowest by all IT professionals in this study. This indicates that out of all job attributes assessed IT workers are most dissatisfied with the chain of communication in the company. In their research on IT occupational culture Jacks and Palvia (2014) found “open communication” to be one of the most important dimensions in IT culture. Interviewees and respondents of their survey emphasized the importance of effective communication between IT people and the end-users as well as between IT employees and management. Schmiedel et al. (2016) determined complaints about senior management such as a lack of direct reporting to senior executives to be one of the biggest complaints leading to dissatisfaction among employees in the IT sector. Based on these insights, IT employers should focus on promoting open communication, by informing their IT workers in regular meetings about the company’s on-goings and keeping them involved in internal processes.

Compensation and social benefits

IT professionals are more satisfied with *compensation and social benefits* in non-IT companies than in IT companies, as revealed by the Mann-Whitney-U test of both the full and the split sample. However, the linear regression on the split sample revealed, that in above average rated IT companies satisfaction levels are higher than in non-IT companies of the same sample group. Dabirian et al. (2019) also noted that pay and other non-monetary benefits were consistently praised by IT employees in top-rated IT companies, whereas in low-rated companies employees consistently complained about the “economic value”, which suggests that compensation and social benefits are an important influence in both the attraction and attrition of IT professionals. Then again, in their analysis of influences on employee satisfaction in the IT sector Schmiedel et al. (2016) identified benefits as a neutral factor, having no effect on employee satisfaction. This ties in with Herzberg’s widely known two-factor-theory which claims that salary, wages and other benefits are “hygiene” factors, whose absence cause dissatisfaction. Their presence, however, only cause the feeling of not being dissatisfied but also not motivated (Herzberg et al. 1959). Further research could attempt to determine how compensation and benefits are best arranged in order for them to increase job satisfaction and motivation among IT personnel. Insights of this nature could also help IT companies raise their employer attractiveness for IT talent in the competition with non-IT brands.

Interesting tasks

Comparing the reviews of IT employees in non-IT firms and IT firms demonstrated that the non-IT group assessed the category *interesting tasks* better than the IT-group. “Interest value” has also been identified as an important factor in attracting and retaining IT talent, as it has been equally praised and complained about by former and current IT employees in Dabirian et al.’s (2019) study of what makes an IT company an attractive employer. Reviewers specifically expressed frustration with bureaucracy, repetitive tasks and a mismatch between qualifications and the job profile. Along the same lines, Schmiedel et al.’s (2016) study of the relevance of cultural factors in IT companies found a challenging work environment of fast pace to be one of the most positively perceived cultural factors. Concerning the satisfaction disparity between IT personnel in IT firms and non-IT firms, employers should always ensure that IT workers are adequately challenged and encouraged by their tasks and that their work expectations are met.

Career and further education

Particularly among top rated companies, IT employees in IT companies are more satisfied with *career and further education* than in non-IT companies. This finding implies that providing attractive career growth and training opportunities to IT professionals may be a great asset of an employer to distinguish oneself from competitors. However, Dabirian et al. (2019) found in their study that the “development value” does not feature strongly in attracting or retaining IT talent as it was mentioned less frequently in reviews. Lounsbury et al. (2014) determined in their research of IT personality traits that IT workers have lower levels of work drive than other occupational groups. The researchers attributed this to the idea that IT employees are offered less advancement opportunities or other incentives for hard work. Taking these insights into consideration, managers should implement different career growth incentives and monitor IT employees’ acceptance and satisfaction over time.

Image

In the category *image* IT professionals rated how well-regarded the employer is among colleagues and if the employer brand image matches reality. The test of comparison showed that IT professionals are more satisfied with the *image* in non-IT firms than with that of IT firms, which means that non-IT firms do better with respect to meeting IT peoples’ expectations regarding the employer’s image. In the linear regression analysis of the split sample, however, *image* emerged as a positive factor of satisfaction among IT personnel working in well regarded IT companies. In Dabirian et al. (2019) investigation of IT companies’ employer attractiveness,

the “brand image” turned up as a new element that IT employees specifically cared about when reviewing their employer. The employees mostly voiced negative opinions about the brand of their employers even in top-rated companies. The reviewers shared disappointment with the company itself, suggesting that their expectations of how hip, cool and innovative their employer would be were not met. In light of these findings, IT companies are advised to portray a realistic brand image as an employer to current employees and potential candidates. Aligning external and internal branding strategies is key in the effort of closing this gap between perception and corporate reality, which would help retaining IT talent.

Issues of age discrimination, social and environmental awareness as well as working conditions did not arise in the studies referenced in this chapter, which means that they either were not determined as influential factors of the IT occupational and organizational culture or have not yet been specifically investigated in this area of academic research. Climate change and an aging society are hot topics of the current public debate and both will greatly impact our future economy and labour market. Therefore, it would certainly pose an interesting research subject to examine the influence of social and environmental awareness and treatment of senior employees on the attractiveness of IT employers. The present study has contributed to this field of research by providing first insights as to how IT professionals evaluate these issues.

After discussing some of the differences regarding specific job aspects between the groups of IT professionals in IT companies and non-IT companies, it should be emphasized again at this point that the multiple linear regression determined no significant influence of the group membership on the overall IT employee satisfaction. This leads to the conclusion that companies who endeavour to attract and retain IT talent are not per se at an advantage or disadvantage just because they operate in a certain industry sector. Employers should instead focus on improving their propositions concerning the individual dimensions of a job, such as compensation and benefits, colleague relationships, brand image, working conditions etc. to fit the IT professionals needs and expectations.

Setting aside the non-significance of the employers’ group membership as a predictor for IT employees’ overall satisfaction, other predictors were found to be significant. IT employees evaluate their former employers worse than their current employers. This could mean that the dissatisfaction with the former employer expressed in the reviews is the reason why the IT employees left the job, but it is also possible that the termination of the employment caused IT professionals to leave a bad review as an act of revenge.

The influence of the hierarchal position on job satisfaction has been academically investigated before. For instance, Ebeling et al. (1979) found that middle managers (second level position) expressed a larger degree of job satisfaction than foremen (third level position), chiefs (highest level position) and lastly workers (lowest level position). Robie et al.'s (1998) study yielded similar results, showing that job satisfaction increased with increasing job level. Based on the results of this study this claim seems to hold true with IT professionals, as IT managers were more satisfied with their employers than simple IT employees. Since Kununu only provides a rough distinction between “employee” and “management”, it would be interesting to investigate how IT professionals’ job satisfaction develops for example in top management positions.

9. Limitations

The findings of this study have to be seen in light of some limitations. Firstly, the approach of using online employee reviews naturally restricts the generalizability of these findings as the sample is limited to those employees willing to voice their opinion online. Secondly, the legitimacy of each review cannot be fully guaranteed by the platform whilst assuring users’ anonymity as discussed in detail in chapter 4.4 of this thesis. Furthermore, the sample is limited to companies with a significant amount of reviews by IT professionals as I aimed to collect forty reviews per company. Additionally, companies that were deemed most attractive employers in the Universum Global (2018) ranking were taken into account, which were mostly non-IT companies. The combination of these two influences resulted in a sample of reviews from mostly well-known corporations especially in the group of non-IT companies. This could mean that there is a bias distorting the results of the comparison between IT and non-IT firms. In addition, all statistical analysis was based on data collected by Likert scale, which has limited information value. IT professionals subjectively evaluated different job attributes on Kununu such as compensation and social benefits, communication, colleague relationship, working conditions etc. Although reviewers could click on an info-icon in Kununu’s evaluation mask to get further explanations on what each category means, the clarification is kept loose (see chapter 5.3.). Everybody has different life and work experiences that affect how one feels towards a certain job aspect. The evaluation scale from one star equalling “very bad” to five stars “very good” lacks nuance and specificity especially regarding the levels in between. This could explain the high frequency of five-star evaluations among the respondents. Another problem with the assessment by Likert-scale is that an outsider does not have any knowledge about what the company is offering their employees. It is therefore important to note the difference in

interpretation: a less favourable evaluation of the working conditions in IT companies compared to non-IT firms does not imply that the working conditions in IT companies are worse; it simply means that IT employees are less satisfied with what they are getting. Interpretations of such evaluation discrepancies between the IT and non-IT group and possible explanations given in this thesis are mostly speculative and anecdotal. Research of what IT professionals value in an employer and what factors they find desirable in a work environment has been done based on the textual parts of reviews on employer rating platforms, which provided a deeper insight into a company's offerings and IT employees' preferences (Dabirian et al. 2019; Schmiedel et al. 2016). These studies however only included IT firms and therefore do not allow for any comparative conclusions.

10. Conclusion

This work of research aimed to investigate IT professionals' job satisfaction on the basis of online employer evaluations on the platform Kununu. Results showed that IT professionals evaluate their employers fairly positively. IT workers exhibit similar satisfaction levels with all thirteen job facets assessed in the reviews. The study's sample is composed of both IT professionals working in IT companies and IT professionals working in non-IT firms. The literature review of occupational culture and organizational culture in information technology revealed that IT professionals' personality traits and values largely match with the organizational culture dimensions in IT companies. Since IT professionals usually constitute the staff majority in IT companies, this finding is not surprising. Following the attraction-selection-attrition theory it seems consequential that the IT occupational culture is dominant in the organizational culture of IT companies. Research has shown that a good person-organization-fit, meaning the conformity of personal and organizational values, leads to higher job satisfaction. Due to the assumed high level of P-O-fit between IT professionals and IT companies, a higher overall job satisfaction compared to IT employees in non-IT companies was expected (*H1*). However, comparative testing by t-test resulted in the rejection of the hypothesis. Quite the contrary is the case: IT employees working in non-IT firms are significantly more satisfied overall. Furthermore, multiple linear regression revealed that the employers' industry affiliation – IT or non-IT – has no significant influence on the overall job satisfaction of IT professionals. These results however do not allow for any conclusions to be drawn about P-O-fit in the IT sector. Although good P-O-fit may lead to high job satisfaction, a backward interpretation of this relationship is not valid. In this case lower IT employee

satisfaction in IT companies compared to non-IT companies does not necessarily indicate a poorer P-O-fit. The matter of P-O-fit in the IT sector ought to be investigated in further research.

Looking at job facets concerning the social interaction at the workplace – namely *work atmosphere* (H2a), *colleague relationship* (H2b) and *communication* (H2c) – higher satisfaction levels were expected in IT companies than in non-IT companies. Hypotheses H2a and H2c are partly supported as *work atmosphere* and *communication* emerged as positive drivers of job satisfaction in IT firms rated above average since they are rated better than in non-IT companies of the same sample group. Among well regarded companies, IT professionals are more satisfied with *colleague relationships* in IT companies than non-IT companies, thus hypothesis H2b can be confirmed in this regard. However, results from tests of the sample group rated below average disprove hypotheses H2a-c since non-IT companies were assessed better in those categories.

Job attributes concerning the job itself such as *career and further education* (H3a), *working conditions* (H3b) and *interesting tasks* (H3c) were also expected to be rated higher by IT professionals working in IT companies than those working in non-IT companies. Hypothesis H3a is confirmed regarding companies performing above Kununu average since *career and further education* is rated higher in IT companies. Yet surprisingly, IT employees are more satisfied with *working conditions* and *interesting tasks* in non-IT firms than in IT firms. Hypotheses H3b and H3c are therefore rejected as a result of the Mann-Whitney-U-test on the full sample.

Due to the demographics of the German IT workforce the evaluation categories *equality* (H4a) and *treatment of senior colleagues* (H4b) were expected to be evaluated better among IT employees working in non-IT companies than ones working in IT companies. The multiple linear regression revealed that with companies rated below average working in a non-IT company influences IT professionals' satisfaction with *equality* and *treatment of senior colleagues* positively. Therefore, hypothesis H4a and H4b are confirmed within this sample group. On the contrary, the linear regression of the full sample demonstrated that the category *treatment of senior colleagues* is the only job aspect where IT employees' satisfaction increases IT companies compared to non-IT companies. This finding is considered to be contradicting hypothesis H4b.

Beyond the job facets discussed as hypotheses other evaluation categories turned out to differ significantly between the employer groups (IT and non-IT). Most notably *compensation and social benefits* is considered more satisfactory among IT professionals working in non-IT

companies than ones working in IT companies, as proven by the Mann-Whitney-U-test on the full and the split sample. Furthermore, IT professionals rate the *image* of non-IT companies higher than of IT companies. Interestingly, both of these aspects also emerged as praise factors among IT employees working in well-regarded IT companies, which suggests that IT employers should take great care to meet IT personnel's expectations in these areas in order to raise job satisfaction.

This study does not aim to give any specific advice on how to raise job satisfaction with IT employees. Nonetheless, the literature and statistical analysis brought forth aspects of employment – namely, compensation and benefits, internal communication, brand image, interest value of tasks and interpersonal relations – that might require more managerial attention and improvement in order to increase IT employee satisfaction.

Lastly, this study hopes to add to the relatively small research corpus using crowdsourced employer rating platforms as a source of data. Online employer reviews contain vast information value and provide wide-ranging research opportunities. Further research could focus on employee satisfaction in other occupational groups. Comparing reviews of different occupational groups may provide insights as to how employees' needs must be addressed differently based on their profession. An investigation of reviews by former employees might bring further understanding into causes of staff turnover. Since this study mostly considered large companies, it would be interesting to explore how small companies compare.

The same digital revolution that so rapidly increased demand for IT professionals also enables researchers to use a readily available online source of data to investigate said IT professionals.

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12. Appendix

Appendix 1: Sources of companies' key figures

Last checked on 7/28/2019. Currency exchange rate from 7/28/2019 (USD 1 ≈ EUR 0.8978).

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- adesso: <https://www.adesso-group.de/adesso-group-de/investor-relations/veroeffentlichungen/finanzberichte/2018/adesso-geschaeftsbericht-2018.pdf>
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https://www.aldi-nord.de/content/dam/aldi/germany/verantwortung/ALDI_Nord_Zwischenbericht_2018.pdf.res/1564405928094/ALDI_Nord_Zwischenbericht_2018.pdf
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- AUDI: <https://www.audi.com/de/company/investor-relations/reports-and-key-figures/annual-reports.html>;
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- Awinta: <https://www.awinta.de/ueber-uns/aneWS/news/awinta-attraktiver-arbeitgeber-fuer-unterschiedlichste-berufsfelder-auch-viele-pkas-ptas-und-apothe/> ;
https://www.awinta.de/fileadmin/user_upload/aMotion/PHARMASOFT/18/07/1807_aMotion_PHARMASOFT_Doppelseiten.pdf
- Axians: <https://www.axians.de/de/unternehmen/ueber-uns/#portfolio>
- Bayer: <https://geschaeftsbericht2018.bayer.de/>;
https://www.finanzen.net/bilanz_guv/bayer
- BMW: https://www.finanzen.net/bilanz_guv/bmw
- Bosch: https://www.finanzen.net/bilanz_guv/bosch
- Deutsche Bundeswehr:
https://www.bundeswehr.de/portal/a/bwde/start/verwaltung/pers_recht_seelsorge/zahlen_zivilpersonal!/ut/p/z1/04_Sj9CPykssy0xPLMnMz0vMAfIjo8zizSxNPN2Ngg18_Y3dnAwCAw3Mgl1CjQwNDAz0wwkpiAJKG-AAjgb6wSmp-pFAM8xxm2GoH6wfpR-VlViWWKFXkF9UkpNaopeYDhKhfmRGYl5KTmpAfrIjRKAgN6LcoNxREQAFq9oF/dz/d5/L2dBISEvZ0FBIS9nQSEh/#Z7_694IG2S0MO3FB0QQ06SDU21001 ;
https://www.bundeswehr.de/portal/a/bwde/start/streitkraefte/grundlagen/staerke!/ut/p/z1/hY7NCsIwEISfxUOv2Zji7y1VEKVCxaJtLhJrTCtpUtlY-vhGPAmKc9vZb4YBBhkwzbtKclczZzZW_czY-RdM4jcmMkDRZLPF6G0bRcEfI6jCE4z-A-Tf-IYphfxGQ-47Jr4505yFgwG684w_UGOuUcIgXr4WQl1xflEhMQd_GBphU5vyeTvU5nEpgVlyFfRbdrbdL55p2HuAA932PpDFSCVSYOsDfIqVpHWSfJDR11uNwpLqYDp6g0kpt/dz/d5/L2dBISEvZ0FBIS9nQSEh/#Z7_B8LTL2922TPCD0IM3BB1Q22TQ0
- Cisco Systems: https://www.finanzen.net/bilanz_guv/cisco

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- Daimler: <https://www.daimler.com/investoren/kennzahlen/>
- Dataport AöR: <https://www.dataport.de/Seiten/Unternehmen/%C3%9Cber-uns.aspx>
- Datev: <https://www.datev.de/web/de/m/ueber-datev/das-unternehmen/kurzprofil/>
- Deutsche Post DHL: <https://www.dpdhl.com/de/investoren/kennzahlen.html>
- Deutsche Telekom: <https://www.telekom.com/de/medien/medieninformationen/detail/geschaeftszahlen-2018-563878>
- Diebold Nixdorf: https://www.finanzen.net/bilanz_guv/diebold_nixdorf_1
- Freenet Group: https://www.freenet-group.de/investor-relations/ir-mitteilungen/freenet-group-legt-geschaeftsbericht-2018-vor-und-bestaetigt-vorlaeufige-zahlen_7140042_4497924.html
- H&D: <https://www.hud-karriere.de/> ; https://de.wikipedia.org/wiki/H%26D_%E2%80%93_An_HCL_Technologies_Company
- HDI Gruppe: <https://www.hdi.de/privatkunden/ueber-uns/unternehmen/kennzahlen>
- Hemmersbach: https://die-deutsche-wirtschaft.de/famu_top/hemmersbach-gmbh-co-kg-nuernberg-umsatz-mitarbeiterzahl/
- IBM: https://www.finanzen.net/bilanz_guv/ibm
- Itelligence: <https://itelligencegroup.com/de/about-us/zahlen-und-fakten/>
- Lekkerland: <https://de.statista.com/statistik/daten/studie/72856/umfrage/lekkerland-umsatz-in-europa-zeitreihe/> ; <https://www.lekkerland.at/de/unternehmen/index.html>
- Microsoft: <https://news.microsoft.com/de-de/fast-facts/> ; https://www.finanzen.net/bilanz_guv/microsoft
- Oracle: https://www.finanzen.net/bilanz_guv/oracle
- Otto Group: <https://www.ottogroup.com/de/die-otto-group/daten-fakten/Kennzahlen.php>
- Porsche AG: <https://newsroom.porsche.com/de/geschaefts-nachhaltigkeit-bericht-2018/performance/kurzuebersicht-gj-2018-17171.html>
- Rhenus Gruppe: <https://www.rhenus.com/de/de/unternehmen/wir-ueber-uns/>
- Ricoh: <https://www.ricoh.com/about/facts/>
- Sage: <https://de.statista.com/statistik/daten/studie/224109/umfrage/umsatz-der-asklepios-kliniken-gmbh/>
- SAP: <https://www.sap.com/integrated-reports/2018/de/key-facts.html>
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- Sogeti: <https://www.crunchbase.com/organization/sogeti#section-overview> ; https://www.sogeti.com/globalassets/global/content-images/explore/pr/docs/2019_04_25_q1-infographic_en.pdf ; <https://www.owler.com/company/sogeti>
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Appendix 2: T-test of means from reviews in IT and non-IT companies

Group Statistics

Company	N	Mean	Std. Deviation	Std. Error Mean
Non-IT	595	3.831	1.011	0.041
IT	560	3.657	1.190	0.050

Independent Samples Test: Company

	Levene's Test for Equality of Variance		t-test for Equality of Means					
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Intervals of the Difference
								Lower Upper
Equal variances assumed	29.547	0.000	2.682	1153.000	0.007	0.174	0.065	0.047 0.301
Equal variances not assumed			2.669	1098.872	0.008	0.174	0.065	0.046 0.302

Appendix 3: T-test of means from employees' and managers' reviews

Group Statistics

Position	N	Mean	Std. Deviation	Std. Error Mean
Employee	925	3.670	1.139	0.037
Management	230	4.051	0.894	0.059

Independent Samples Test: Job Position

	Levene's Test for Equality of Variance		t-test for Equality of Means					
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Intervals of the Difference
								Lower Upper
Equal variances assumed	42.947	0.000	-4.718	1153.000	0.000	-0.380	0.081	-0.539 -0.222
Equal variances not assumed			-5.449	433.678	0.000	-0.380	0.070	-0.518 -0.243

Appendix 4: T-test of means from former and current employees' reviews

Group Statistics

Job-Status	N	Mean	Std. Deviation	Std. Error Mean
Former	149	2.708	1.049	0.086
Current	1006	3.900	1.027	0.032

Independent Samples Test: Job Status

	Levene's Test for Equality of Variance		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Intervall of the Difference	
								Lower	Upper
Equal variances assumed	1.549	0.214	-13.188	1153.000	0.000	-1.192	0.090	-1.370	-1.015
Equal variances not assumed			-12.987	192.479	0.000	-1.192	0.092	-1.373	-1.011

Appendix 5: Descriptive Statistics of the 13 evaluation categories

<i>Descriptives</i>							
	N	Mean	Median	Mode	Std. Deviation	Variance	Skewness
Work Atmosphere	1155	3.82	4	5	1.304	1.700	-0.894
Superiors' Behaviour	1155	3.57	4	5	1.465	2.147	-0.653
Colleague Relationship	1155	4.11	4	5	1.106	1.223	-1.286
Interesting Tasks	1155	3.88	4	5	1.307	1.709	-0.986
Communication	1155	3.39	4	4	1.325	1.755	-0.505
Equality	1155	3.99	4	5	1.265	1.600	-1.117
Treatment of Senior Colleagues	1155	4.01	5	5	1.270	1.612	-1.173
Career / Further Education	1155	3.50	4	5	1.442	2.080	-0.568
Compensation / Social Benefits	1155	3.68	4	5	1.310	1.716	-0.777
Working Conditions	1155	3.72	4	5	1.306	1.704	-0.811
Environmental- / Social Awareness	1155	3.72	4	5	1.309	1.714	-0.801
Work-Life-Balance	1155	3.68	4	5	1.328	1.764	-0.712
Image	1155	3.63	4	5	1.344	1.806	-0.697

Appendix 6: Kolmogorov-Smirnov test of probability distributions of two samples

Kolmogorov-Smirnov two samples test

Kolmogorov-Smirnov two samples test					Kolmogorov-Smirnov-Z	Asymp. Sig. (2-tailed)
		Most Extreme Differences				
		Absolute	Positive	Negative		
z-scores	Work Atmosphere	0.387	0.288	-0.387	6.566	0.000
	Superiors' Behaviour	0.373	0.373	-0.055	6.339	0.000
	Colleague Reltionship	0.471	0.020	-0.471	7.993	0.000
	Interesting tasks	0.416	0.416	-0.091	7.067	0.000
	Communication	0.307	0.307	-0.230	5.219	0.000
	Equality	0.467	0.243	-0.467	7.936	0.000
	Treatment of Senior Colleagues	0.491	0.209	-0.491	8.335	0.000
	Career / Further Education	0.326	0.251	-0.326	5.538	0.000
	Compensation / Social Benefits	0.259	0.259	-0.160	4.398	0.000
	Working Conditions	0.339	0.339	-0.067	5.763	0.000
	Environmental- / Social Awareness	0.358	0.271	-0.358	6.080	0.000
	Work-Life-Balance	0.348	0.348	-0.057	5.914	0.000
	Image	0.332	0.332	-0.089	5.641	0.000

Group variable: IT/ Non-IT

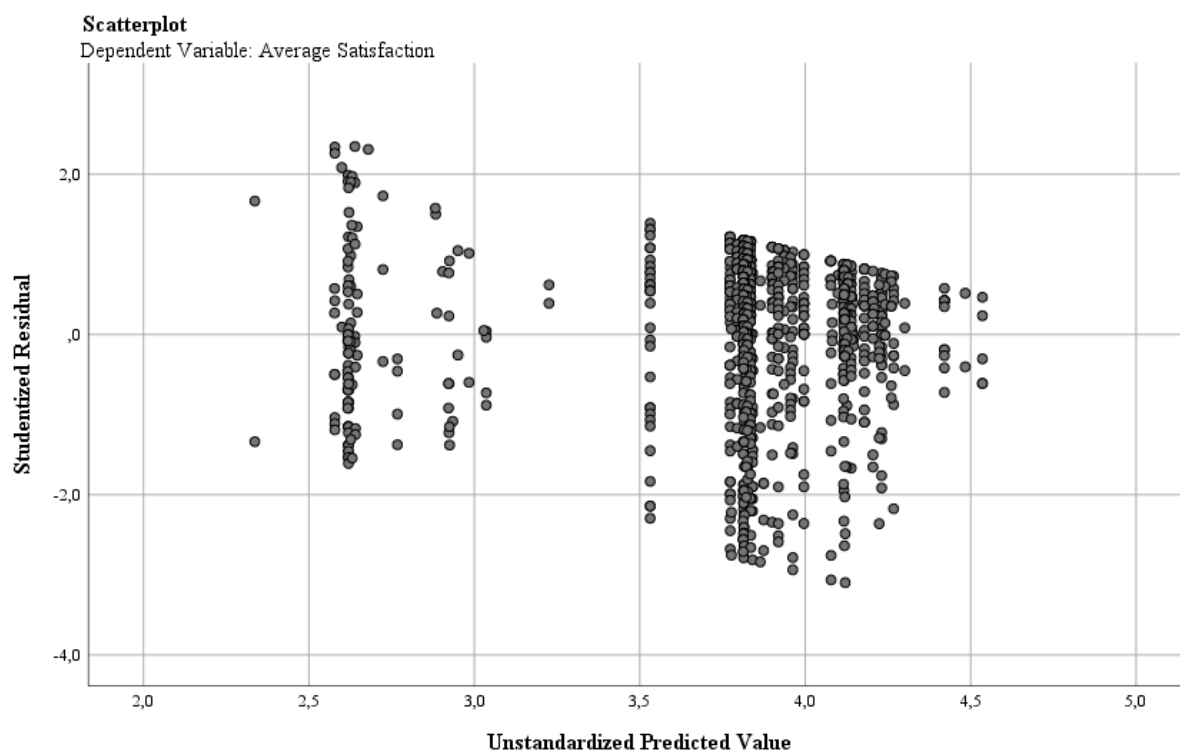
Appendix 7: Mann-Whitney-U test of evaluation categories in IT and non-IT companies

<i>Mann-Whitney-U Test</i>								
Evaluation Categories	Group	N	Mean Rank	Sum of	Mann-Whitney-U	Z	Sig. (2-tailed)	p
Work Atmosphere	Non-IT	595	580.12	345172.50	165337.50	-0.234	.815	n.s.
	IT	560	575.75	322417.50				
Superiors' Behaviour	Non-IT	595	585.88	348596.50	161913.50	-0.859	.390	n.s.
	IT	560	569.63	318993.50				
Colleague Relationship	Non-IT	595	571.18	339854.00	162544.00	-0.772	.440	n.s.
	IT	560	585.24	327736.00				
Interesting Tasks	Non-IT	595	603.93	359336.00	151174.00	-2.882	.004	**
	IT	560	550.45	308254.00				
Communication	Non-IT	595	593.55	353163.00	157347.00	-1.682	.093	n.s.
	IT	560	561.48	314427.00				
Equality	Non-IT	595	573.13	341015.00	163705.00	-0.549	.583	n.s.
	IT	560	583.17	326575.00				
Treatment of Senior Colleagues	Non-IT	595	585.84	348575.00	161935.00	-0.889	.374	n.s.
	IT	560	569.67	319015.00				
Career / Further Education	Non-IT	595	592.83	352731.00	157779.00	-1.608	.108	n.s.
	IT	560	562.25	314859.00				
Compensation / Social Benefits	Non-IT	595	641.01	381403.00	129107.00	-6.875	.000	***
	IT	560	511.05	286187.00				
Working Conditions	Non-IT	595	598.46	356081.50	154428.50	-2.237	.025	*
	IT	560	556.27	311508.50				
Environmental- / Social Awareness	Non-IT	595	584.33	347676.00	162834.00	-0.692	.489	n.s.
	IT	560	571.28	319914.00				
Work-Life-Balance	Non-IT	595	595.37	354248.00	156262.00	-1.896	.058	n.s.
	IT	560	559.54	313342.00				
Image	Non-IT	595	596.39	354852.00	155658.00	-2.001	.045	*
	IT	560	558.46	312738.00				

n.s.: $p > .05$, *: $p < .05$, **: $p < .01$, ***: $p < .001$

Appendix 8: Multiple linear regression – Testing of requirements

A. Assessing Linearity / Outliers / Homoscedasticity



B. Assessing Multicollinearity

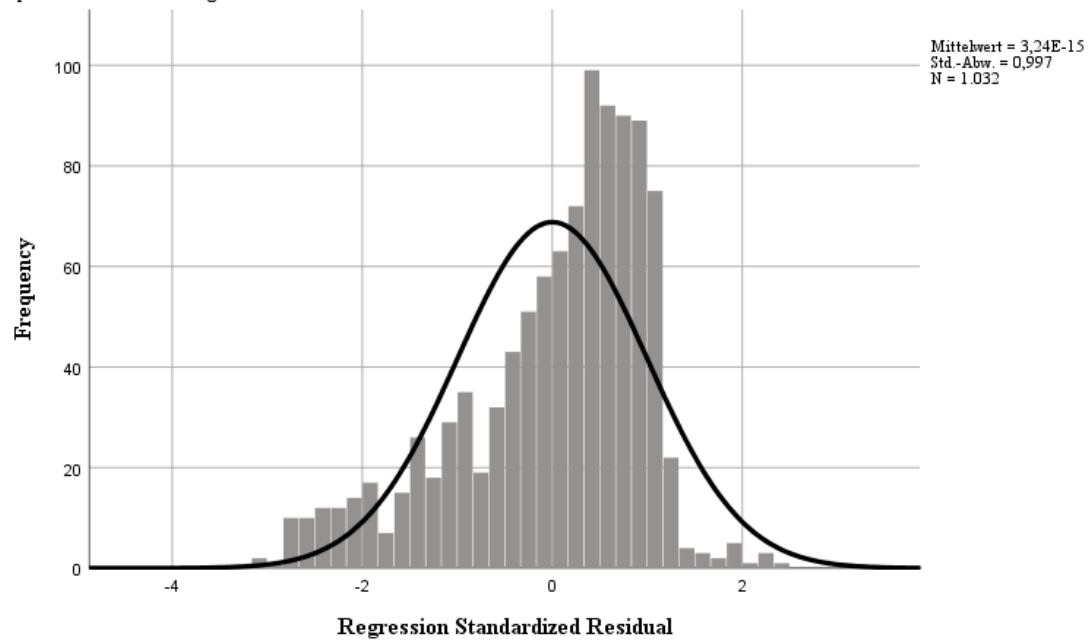
Model	Collinearity Statistics	
	Tolerance	VIF
1 (Constant)		
IT/ Non-IT	0.692	1.445
Job Status	0.985	1.015
Job Position	0.991	1.009
Employee Number in k (2018)	0.514	1.947
Founding Year	0.762	1.313
Revenue in bln € (2018)	0.506	1.975

a. Dependent Variable: Average Satisfaction

C. Assessing Normality

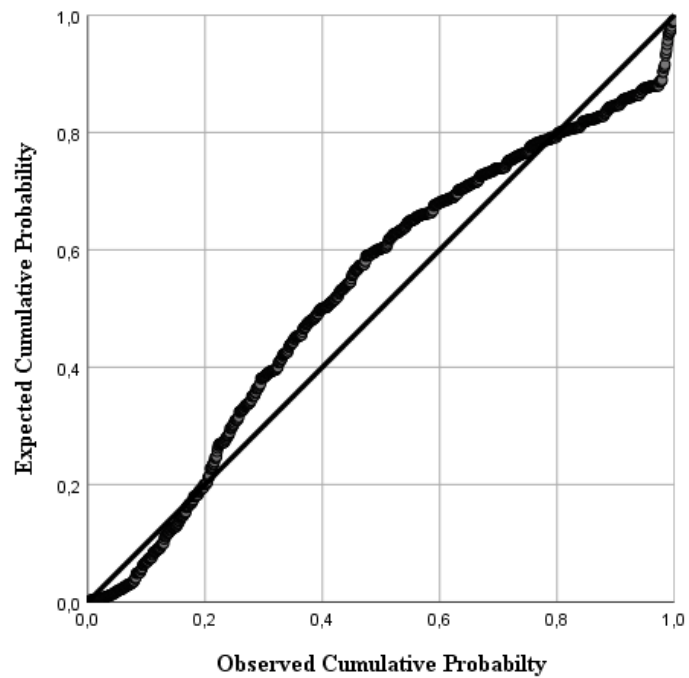
Histogram

Dependent Variable: Average Satisfaction



Normal P-P Plot of Standardized Residual

Dependent Variable: Average Satisfaction



Appendix 9: Abstract

A. Abstract in German

Der Fachkräftemangel ist in Deutschland aktuell ein heiß diskutiertes Thema im politischen und ökonomischen Diskurs. Insbesondere im Bereich der Informationstechnologie, welche durch die voranschreitende Digitalisierung in alle Branchen und Lebensbereiche eingedrungen ist, wird händeringend nach gut ausgebildeten Fachkräften gesucht. Unternehmen befinden sich im Wettbewerb, wenn es darum geht für IT Fachkräfte als Arbeitgeber attraktiv zu sein und sie im Unternehmen zu halten. Die vorliegende Arbeit beabsichtigt, die Arbeitszufriedenheit auf von IT-Fachkräften auf Basis verschiedener Jobmerkmale zu untersuchen. Außerdem werden auf Grundlage organisationspsychologischer und kulturtheoretischer Ansätze Unterschiede in der Zufriedenheit von IT Mitarbeitern in IT Firmen und in nicht-IT Firmen herausgearbeitet. Das Arbeitgeberbewertungsportal Kununu bietet Arbeitnehmern eine Plattform, ihr Unternehmen kostenlos und anonym in dreizehn Kategorien zu bewerten. In der vorliegenden Arbeit wurden 1155 Bewertungen von IT Mitarbeitern aus Unternehmen verschiedener Branchen gesammelt und mittels deskriptiver Analyse und multipler linearer Regression untersucht. Dabei zeigte sich, dass IT Mitarbeiter insbesondere den *Kollegenzusammenhalt* bei der Arbeit gut bewerten. Am schlechtesten schneidet die Kategorie *Kommunikation* ab. Beim Vergleich von IT Mitarbeitern, die in IT Firmen arbeiten, und denen, die in nicht-IT Unternehmen arbeiten, stellen sich signifikante Bewertungsunterschiede bei einigen Jobmerkmale heraus. So waren IT Mitarbeiter in nicht-IT Firmen mit *Gehalt und Sozialleistungen* eindeutig zufriedener als in IT Firmen. Überraschenderweise zeigen sich IT Fachkräfte in nicht-IT Firmen auch zufriedener mit den Kategorien *Interessante Aufgaben* und *Arbeitsbedingungen*. Wiederum können besonders gut bewertete IT Firmen mit den Jobaspekten *Kollegenzusammenhalt*, *Arbeitsatmosphäre* sowie *Karriere und Weiterbildung* bei ihren IT Mitarbeitern punkten. Schlussendlich ergab die lineare Regression jedoch, dass die Branchenzugehörigkeit des Arbeitgebers keinen signifikanten Einfluss auf die allgemeine Zufriedenheit der IT Mitarbeiter hat.

B. Abstract in English

The shortage of skilled professionals is currently a hot topic of the political and economic discourse in Germany. With the ongoing digitalization, information technology has penetrated all industries and areas of life; thus, causing the demand for skilled IT professionals to be especially high. Companies find themselves in fierce competition, when trying to attract and retain IT professionals. This thesis aims to investigate IT employees' job satisfaction on the basis of different job attributes. Furthermore, job satisfaction differences of IT employees working in different industry sectors are presented on the basis of theoretical cultural and organization-psychological approaches. The employer rating platform Kununu provides employees with an opportunity, to rate and review their employer in thirteen categories anonymously and free of charge. In this study, 1155 reviews from IT employees working in different companies across all industries were gathered and analysed by means of descriptive and comparative analysis as well as multiple linear regression. It was shown that IT professionals rate the job attribute *colleague relationship* especially positively. In contrast, IT professionals are least satisfied with the category *communication*. Comparing IT employees working in IT companies with the ones working in non-IT companies, significant evaluation differences with several job attributes became apparent: IT professionals in non-IT firms are unequivocally more satisfied with *compensation and social benefits* than their peers in IT firms. Surprisingly, IT employees of non-IT firms also indicate higher satisfaction levels with categories *interesting tasks* and *working conditions*. Then again, well rated IT companies especially are able to score higher in the categories *colleague relationship*, *work atmosphere* and *career and further education* than their non-IT competitors. However, results of the linear regression ultimately revealed that the employer's industry affiliation (IT or non-IT) has no significant influence on IT professionals' overall job satisfaction.